

13TH EDITION

NGC
Construction
Guide

National 
Gypsum®

Building Products For A Better Future[®]

National Gypsum Company
is headquartered in
Charlotte, North Carolina.



National Gypsum Company is one of the world's largest gypsum board producers and a full-line supplier of quality building products used worldwide. We are recognized as a leader in product innovation and provide customer service that exceeds expectations. Sustainability is an integral part of our philosophy with LEED[®]-certified products that promote indoor air quality. Our manufacturing plants are strategically located from coast to coast so we can help keep your projects moving. Put simply, we are recognized as the industry leader and our goal is to enable you to design and build for a better future.

Research And Testing At Your Service



NGC Testing Services: Whether you want to test product performance and quality or confirm certifications, our comprehensive laboratory will handle everything from start to finish. We conduct our tests in accordance with ASTM, ULC, NFPA, UL, FM, ISO and more, and we can accommodate the largest full-scale specimens. Located in Buffalo, New York, our 50,000-plus square-foot facility allows easy access to most North American metropolitan centers and the Canadian border.

Technology Innovation

Center (TIC): Where our research and development team generates exceptional product and process solutions. From the preliminary investigation of a product to its launching, the TIC is the hub for new product development. It also serves as a liaison for building and regulatory codes. This 30,000-square-foot center is conveniently situated less than half a mile from our Charlotte, North Carolina, headquarters.

Table Of Contents

CUSTOMER SUPPORT	6
SUSTAINABILITY OVERVIEW	8
PRODUCT OVERVIEW	10
PURPLE® OVERVIEW	12
PRODUCT SELECTOR	14
FIRE AND SOUND SELECTOR	32
PRODUCT SECTIONS	63
LEVELS OF GYPSUM BOARD FINISH	264
WOOD-FRAMED SYSTEMS	305
STEEL-FRAMED SYSTEMS	311
GYPSUM BOARD OVER MASONRY	321
PLASTER SYSTEMS	323
CAVITY SHAFTWALL SYSTEMS	345
AREA SEPARATION WALL	359
ACOUSTICS	367
BUILDING SCIENCE OVERVIEW	375
FREQUENTLY ASKED QUESTIONS AND SOLUTIONS	381
ABUSE AND IMPACT TEST PROCEDURES	388
HANDLING AND PROJECT CONDITIONS AND MAINTENANCE	389
WARRANTY	390
CUSTOMER SALES CONTACT INFORMATION	391
TRADEMARKS	391



Gold Bond® BRAND GYPSUM BOARD PRODUCTS AND PLASTER SYSTEMS

1. Gold Bond® BRAND Gypsum Board	63
2. Gold Bond® BRAND High Strength LITE® Gypsum Board	69
3. Gold Bond® BRAND High Strength Ceiling Board	75
4. Gold Bond® BRAND ThermalFOIL® Gypsum Board	79
5. Gold Bond® BRAND Fire-Shield® Gypsum Board	85
6. Gold Bond® BRAND High Strength Fire-Shield® LITE® Gypsum Board	91
7. Gold Bond® BRAND High Strength Fire-Shield® LITE® 30 Gypsum Board	97
8. Gold Bond® BRAND 3/4" Ultra-Shield FS® Gypsum Board	101
9. Gold Bond® BRAND Foil Back Gypsum Board	105
10. Gold Bond® BRAND High Flex® Gypsum Board	111
11. Gold Bond® BRAND Durasan® Prefinished Gypsum Board	117
12. Gold Bond® BRAND Gypsum Sheathing	123
13. Gold Bond® BRAND Fire-Shield® Shaftliner	129
14. Gold Bond® BRAND Gridstone® Ceiling Panels	133
15. Gold Bond® BRAND Gridstone® CleanRoom Ceiling Panels	137
16. Gold Bond® BRAND Gridstone® Hi-Strength Ceiling Panels	141
17. Gold Bond® BRAND Kal-Kore® Plaster Base	145
18. Gold Bond® BRAND Uni-Kal® Veneer Plaster	152
19. Gold Bond® BRAND X-KALibur® Veneer Plaster	152
20. Gold Bond® BRAND Kal-Kote® Basecoat Plaster	153
21. Gold Bond® BRAND Kal-Kote® Smooth Finish Plaster	153
22. Gold Bond® BRAND Kal-Kote® Texture Finish Plaster	154
23. Gold Bond® BRAND Two-Way Hardwall Plaster	155
24. Gold Bond® BRAND Gypsolite® Plaster	156
25. Gold Bond® BRAND Super-White Gauging Plaster	157
26. Gold Bond® BRAND Super-White Moulding Plaster	157
27. Gold Bond® BRAND Plaster Accelerator	158
28. Gold Bond® BRAND Plaster Retarder	158

XP® PURPLE® GYPSUM BOARD PRODUCTS (PAPER FACED)

1. Gold Bond® BRAND XP® Gypsum Board	159
2. Gold Bond® BRAND XP® Fire-Shield® Gypsum Board	159
3. Gold Bond® BRAND 5/16" XP® Fire-Shield® Gypsum Board	167
4. Gold Bond® BRAND Hi-Abuse® XP® Gypsum Board	171
5. Gold Bond® BRAND Hi-Impact® XP® Gypsum Board	177
6. Gold Bond® BRAND SoundBreak® XP® Gypsum Board	183
7. Gold Bond® BRAND Shaftliner XP®	189

EXP® PURPLE® GYPSUM PANEL PRODUCTS (GLASS MAT)

1. Gold Bond® BRAND EXP® Sheathing	193
2. Gold Bond® BRAND EXP® Shaftliner	199
3. Gold Bond® BRAND EXP® Tile Backer	203
4. Gold Bond® BRAND EXP® Interior Extreme® Gypsum Panels	209
5. Gold Bond® BRAND EXP® Interior Extreme® AR Gypsum Panels	215
6. Gold Bond® BRAND EXP® Interior Extreme® IR Gypsum Panels	221

PermaBase® BRAND CEMENT BOARD PRODUCTS

1. PermaBase® BRAND Cement Board	227
2. PermaBase PLUS® Cement Board	232
3. PermaBase UltraBacker® 1/4" Cement Board Underlayment	234
4. PermaBase 1/4" Underlayment	236
5. PermaBase Flex® Cement Board	238
6. PermaBase® BRAND Fiberglass Mesh Tape	250
7. PermaBase® BRAND Screws	250

ProForm® BRAND JOINT TREATMENT PRODUCTS

ProForm® BRAND Ready Mix Joint Compounds

1. ProForm® BRAND Ultra Lite®	252
2. ProForm® BRAND Lite Blue	252
3. ProForm® BRAND XP® Lite with Dust-Tech®	253
4. ProForm® BRAND XP® with Dust-Tech®	253
5. ProForm® BRAND Multi-Use	254
6. ProForm® BRAND All Purpose	254
7. ProForm® BRAND Taping / Taping Lite	255
8. ProForm® BRAND All Purpose Machine Grade	255
9. ProForm® BRAND All Purpose Orange	256
10. ProForm® BRAND All Purpose Heavy Viscosity	256
11. ProForm® BRAND Topping	257
12. ProForm® BRAND Concrete-Cover	257
13. ProForm® BRAND Tinted-Lite	258

ProForm® BRAND Tape Products

1. ProForm® BRAND Paper Joint Tape	258
2. ProForm® BRAND Paper Joint Tape-Heavy	259
3. ProForm® BRAND Fiberglass Mesh Tape	259
4. ProForm® BRAND Multi-Flex® Tape	259

ProForm® BRAND Quick Set™ Setting Compounds

1. ProForm® BRAND Quick Set™	268
2. ProForm® BRAND Quick Set™ Lite	268
3. ProForm® BRAND FS-90 Fire-Shield®	269

ProForm® BRAND Texture Products

1. ProForm® BRAND Perfect Spray® Medium	276
2. ProForm® BRAND Wall & Ceiling Spray	276
3. ProForm® BRAND All Purpose Texture	277

DEXcell® ROOF BOARD PRODUCTS

1. DEXcell® BRAND Glass Mat Roof Board	279
2. DEXcell® BRAND FA Glass Mat Roof Board	285
3. DEXcell® BRAND Cement Roof Board	291
4. DEXcell® BRAND Technical Information	297

Customer Support You Can Count On

Tap into technical support with a call to 1-800-NATIONAL®, place an order through our award-winning customer service center, or find the answers you want at our online Design Center, where the doors are always open. Our multi-pronged approach to technical support and customer service has one central focus: Helping you design and build better.



Design Center: Whether you need information on the jobsite or in the middle of the night, it is hard to beat the convenience of our Design Center. Our Design Center is always open, and you can access this tool with your smartphone, tablet or laptop. It features information we know you will value, including an online library of high-quality Building Information Modeling (BIM) and Computer-Aided Design (CAD) files. There are also web-based tools to assess submittal pages, guide specifications and safety data sheets. Do you want to locate a Green Product Score (GPS) to assess LEED credits and recycled content? Or choose from a library of accredited continuing education courses to take? It is all here. Visit now at: nationalgypsum.com.



The 1-800 Construction Services Team:
Left to right,
Mark Chapman,
Jim Farrell,
Sam Halverson.



Members of the Customer Service Team:
James White,
Sabrena Francis
and Jan Schiffman.

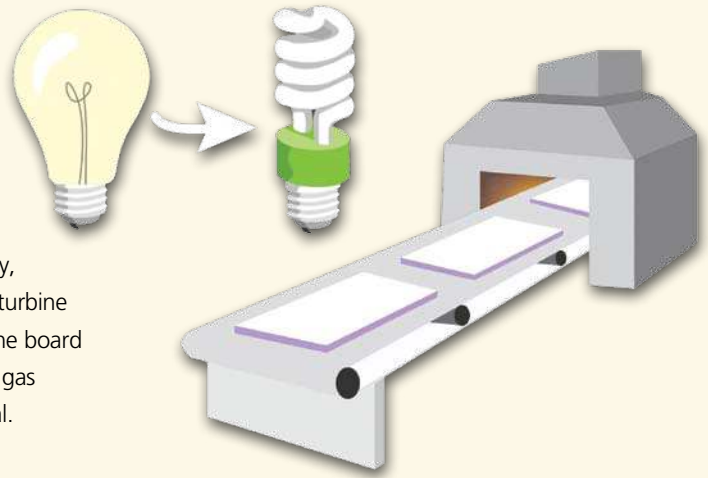
1-800-NATIONAL: Whatever stage your project is in, our 1-800-NATIONAL technical experts are here to support you. If you have questions about products, specifications and building codes, they have answers. Whether you are wondering about the levels of finish, sustainability documentation or the difference between abuse- and impact-resistant gypsum board, they are here for you. They can even review your plans or drawings and assist you with installation issues or product applications. Just call 1-800-NATIONAL – it is that easy.

Customer Service Center: Raise your expectations because here your satisfaction is guaranteed. Welcome to customer service as it should be, where your needs are more than met. The knowledgeable customer account specialists at our centralized customer service center will give you the personal attention you deserve when you place your orders and schedule your deliveries. Their efficient and friendly service is enhanced by our ngc4me.com® website, which allows you to monitor your order history, track the progress of your orders, even place new orders electronically.

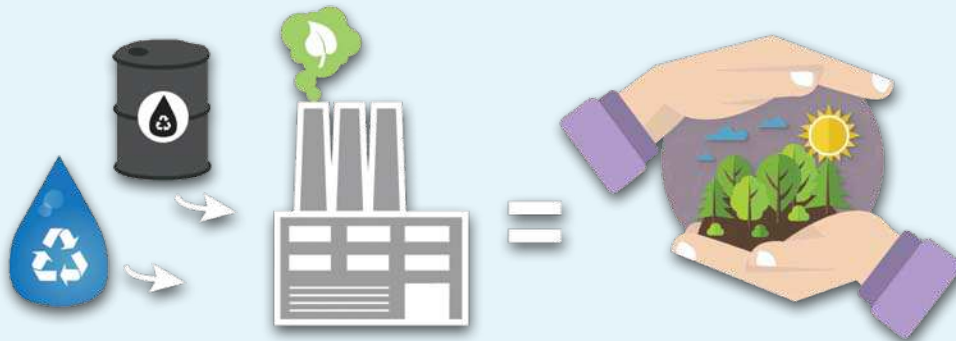
Sustainable Practices For A Better Tomorrow

Energy Savings

We constantly strive to conserve energy. Each day, our plant energy coordinators work to limit energy usage. We have modernized our lighting to limit energy consumption and improve safety, and invested significantly in capital improvements to optimize energy consumption. Another energy-savings example is our Burlington, New Jersey, facility that uses the exhaust from a natural gas-fired electric turbine to heat the board dryer. The heat from the turbine reduces the board plant's fuel usage, while the gas turbine reduces greenhouse gas emissions by 20,000 metric tons per year as compared to coal.



Water, Air And More



We look for ways to recycle, recover and reuse. Associates at all of our plants consistently look for opportunities to either recycle and/or consume less water. Our baghouse systems not only control air pollution, but also recycle collected material back into the manufacturing process. We send used oils, spent vehicle batteries, used wooden pallets, and used solvent from parts and scrap metal to third-party recyclers rather than waste haulers.

We use proven tools to protect the environment. Technologies, such as biological treatment and sedimentation control, are used to treat water prior to discharge. We also use Low NO_x burners in combustion devices and regenerative thermal oxidizers to reduce smog-generating emissions.

Sustainability Documentation

In support of NGC's commitment to building product manufacturer's transparency, Health and Environmental sustainability documents are available on our Design Center. Visit: <http://designcenter.nationalgypsum.com/sustainability>.

Recycled content data and manufacturing location data are available for National Gypsum Company products based upon current National Gypsum distribution plan and manufacturing location capabilities. Visit the Green Product Score website to learn more: gps.nationalgypsum.com/welcome.aspx.

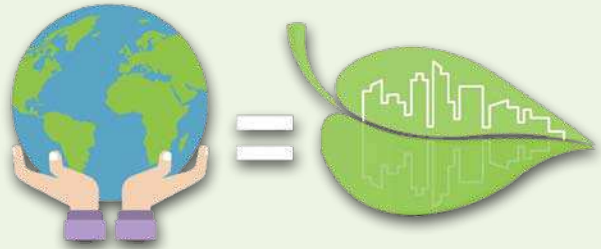
Products manufactured by National Gypsum Company contain no asbestos.

Reducing Transportation



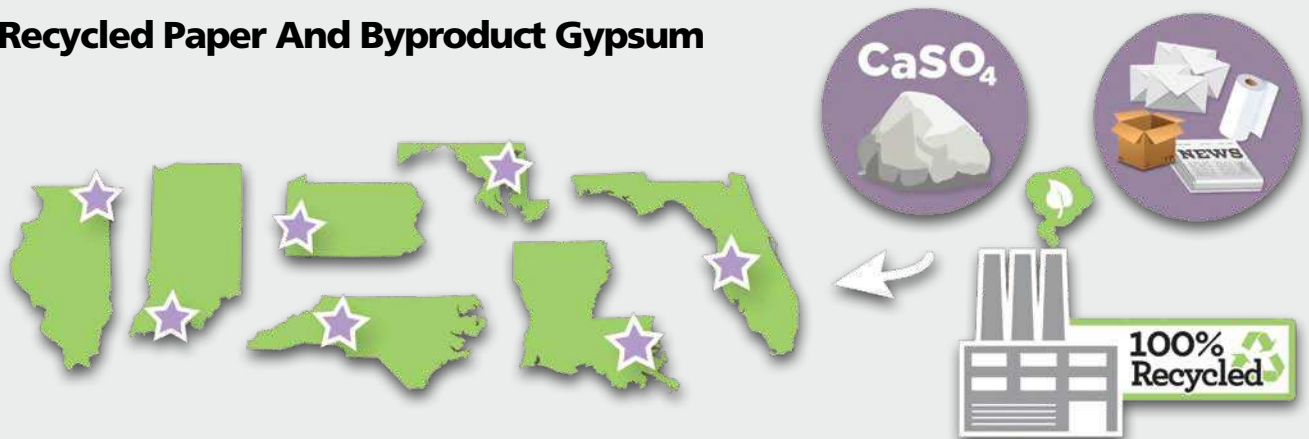
We work to reduce the weight of our products as well as the number of miles we travel. When we manufacture our products, we consider the weight of our material and how that impacts its delivery system. With lower weight products, we can ship more units per truck – lowering fuel consumption per unit of material. Another way we increase efficiency is through thoughtful mapping of our delivery routes. Within our Customer Service Center, we direct orders to the plant closest to you to reduce freight miles and improve our service model. As a result, our teams help to save thousands of gallons of diesel fuel and respective carbon emissions annually.

Design That Considers The Environment



Together, we can attain the highest level of ecological responsibility and resource-efficient technology. We are committed to developing and implementing sustainable green building policies, standards and practices. Beyond offering products that can help contribute to healthier environments and have achieved GREENGUARD Certification for indoor air quality, we can help you meet the criteria for green programs and credits, such as LEED® 2009 and LEED® v4.

Recycled Paper And Byproduct Gypsum



100 percent of our gypsum board face and back paper is produced from post-consumer recyclable content. Our three paper mills manufacture product from recycled cardboard, magazines and trimmings from print shops.

Byproduct Gypsum is the ultimate recyclable. Our byproduct gypsum comes from a process that removes sulfur dioxide from emissions at coal-fired power plants. After the power plants remove fly ash and other impurities from the coal combustion exhaust air, it is fed through a limestone slurry that removes the sulfur dioxide. The byproduct of this process is calcium sulfate, the chemical name for gypsum. Five of our plants produce exclusively with byproduct gypsum: Shippingport, PA; Apollo Beach, FL; Mt. Holly, NC; Westwego, LA; and Shoals, IN. Two of our plants – in Baltimore, MD, and Waukegan, IL – use a combination of byproduct gypsum and natural gypsum rock.

Brands That Make Your Projects Better



Start With The Best: Gold Bond® BRAND

Gold Bond® BRAND offers the industry's most complete line of gypsum board products to meet your project requirements. Whether you want to enhance acoustical performance or need additional abrasion, impact or fire resistance, Gold Bond products deliver with our mark of excellence. Gold Bond products include gypsum board, ceiling board, sheathing, shaftliner, tile backer, prefinished board and plaster products. Take a look at the complete systems you can assemble with Gold Bond products, including walls, partitions, floors and ceilings. Most products are GREENGUARD Certified for indoor air quality.



Reinforce With Gold Bond® BRAND XP®

Gold Bond® BRAND XP® is a specially treated, mold- and fire-resistant paper-faced gypsum board. It provides Xtra Protection (XP) against mold and mildew compared to standard gypsum board. Its mold- and moisture-resistant gypsum core is encased in heavy, mold-, mildew- and moisture-resistant, 100-percent recycled PURPLE® paper on the face. In addition, the XP family of products has achieved GREENGUARD Certification, signifying the highest indoor air quality standards. For optimum mold and mildew resistance, we recommend using XP gypsum board with ProForm® BRAND XP® Ready Mix Joint Compound with Dust-Tech® for low dust.



Enhance With Advanced Fiberglass Technology: Gold Bond® BRAND EXP®

Gold Bond® BRAND EXP® is a technologically advanced fiberglass-faced gypsum line utilizing Sealed Surface Technology. With enhanced moisture and mold resistance, our PURPLE® EXP product line offers a solution for most every design or building challenge you face. Our EXP products will help you construct the finest quality interior and exterior walls and ceilings. Our PURPLE® coated fiberglass facers provide excellent weather and water resistance. Dimensionally stable under changes in temperature, EXP resists warping, rippling and buckling. EXP interior products are GREENGUARD Certified for indoor air quality.

PROFORM[®] BRAND **Interior Finishing Products**

Finish Strong With ProForm[®] BRAND Interior Finishing Products

ProForm[®] BRAND Interior Finishing Products provide the right ready mix or setting compounds to finish your complex projects. ProForm offers high-quality, consistent formulas that are easy to apply, saving you time and effort. Do you need superior bonding, excellent sanding characteristics, lightweight formulas and consistent set times? You can depend on ProForm. Select products even offer added mold resistance or help reduce airborne dust. For your convenience, they are available in various weights and many formulas have achieved GREENGUARD Certification for indoor air quality. There are also ProForm Joint Tapes and ProForm Texture Products, which will help you cover, conceal or create interesting design effects. Use these products for all phases of finishing.

Perma **BASE**[®] BRAND **Cement Board**

Protect From Moisture With PermaBase[®] BRAND Cement Board

PermaBase[®] BRAND Cement Board is a rigid substrate made of Portland cement, aggregate and glass mesh. It provides an exceptionally hard, durable surface that is able to withstand prolonged exposure to moisture in both interior and exterior applications. PermaBase is ideally suited as an underlayment or backing surface for tub and shower surrounds, countertops, flooring and a variety of other interior and exterior applications. With four types of PermaBase Cement Board to choose from, you will find a match for most any project. All feature patented EdgeTech[®] Technology, allowing you to install fasteners closer to the boards' edges, and polystyrene beads, which are embedded in the core to reduce weight. PermaBase is also GREENGUARD Certified for indoor air quality.

DEXcell[®] BRAND **Roof Board**

Take Cover With DEXcell[®] BRAND Roof Board

DEXcell[®] BRAND Roof Board is a high-performance, mold-resistant product that offers your structure exceptional coverage. Three versions (cement board, glass mat and FA glass mat) give you the flexibility to meet your specific commercial roofing applications, whether mechanically fastened or fully adhered. Each product within the line offers particular benefits, allowing you to match the best type of DEXcell Roof Board to your project requirements. Use any of these roof boards as a coverboard and/or thermal barrier. DEXcell Roof Board forms one component among many in a properly designed roof assembly.

PURPLE® – The Color Of Confidence

Whether you're designing a project or installing product in the field, PURPLE® products from National Gypsum offer single-source solutions that provide the performance, support and resources to get the job done right.

Wet or dry, National Gypsum's portfolio of PURPLE XP® paper-faced and EXP® coated fiberglass-faced products delivers the confidence and peace of mind you need to stand behind your work. So be sure to ask for PURPLE®, and know you are building with the best.

EXP® FIBERGLASS FACED (PAPERLESS)

- | | |
|--|---|
| <p>1 EXP® Interior Extreme® Gypsum Panel</p> <ul style="list-style-type: none"> • For use in all rooms • Anywhere mold and moisture is a concern • 12-month exposure warranty | <p>2 EXP® Interior Extreme® AR Gypsum Panel</p> <ul style="list-style-type: none"> • Walls subject to added abuse/abrasion • Scratch and scuff resistant • 12-month exposure warranty |
| <p>3 EXP® Interior Extreme® IR Gypsum Panel</p> <ul style="list-style-type: none"> • Walls subject to impact from hard objects • Resists penetrations • 12-month exposure warranty | <p>4 EXP® Shaftliner</p> <ul style="list-style-type: none"> • For use in fire-rated shafts and stairwells • Resists mold and moisture • 12-month exposure warranty |
| <p>5 EXP® Tile Backer</p> <ul style="list-style-type: none"> • Gypsum backerboard for wet areas • Acrylic-coated facer • Eliminates need for water barrier | <p>6 EXP® Sheathing</p> <ul style="list-style-type: none"> • Accepts a variety of exterior finishes • Finishing of joints not required • 12-month exposure warranty |

XP® PAPER FACED

- | | |
|--|--|
| <p>7 XP® Gypsum Board</p> <ul style="list-style-type: none"> • For use in all rooms • Anywhere mold and moisture is a concern | <p>8 SoundBreak® XP® Gypsum Board</p> <ul style="list-style-type: none"> • Rooms requiring sound control • Reduces sound transmission through walls and ceilings |
| <p>9 Hi-Abuse® XP® Gypsum Board</p> <ul style="list-style-type: none"> • Walls subject to added abuse/abrasion • Scratch and scuff resistant | <p>10 Hi-Impact® XP® Gypsum Board</p> <ul style="list-style-type: none"> • Walls subject to impact from hard objects • Resists penetrations through the gypsum board |
| <p>11 Shaftliner XP® Gypsum Board</p> <ul style="list-style-type: none"> • For use in fire-rated shafts and stairwells • Resists mold and moisture | <p>12 PermaBase® Cement Board</p> <ul style="list-style-type: none"> • Withstands prolonged exposure to moisture • Used behind ceramic tile in wet interior areas • For exterior finishes, such as brick, stucco and stone |
| <p>13 ProForm® XP® Ready Mix with Dust-Tech®</p> <ul style="list-style-type: none"> • Reduces airborne dust • Formulated to cause dust to fall straight to the ground • Mold-resistant | <p>14 ProForm® Quick Set™ Lite Setting Compounds</p> <ul style="list-style-type: none"> • Allows same-day finishing • Consistent set times • Mold-resistant |





 **MEDICAL CENTER**

8

8

12

7

1

1

5

4

8

2

2

4

12

12


3


3


6

13

14


Product	Description	Specifications
Gold Bond® BRAND Gypsum Board	 <p>Use Gold Bond® BRAND Gypsum Board for interior, non-fire-rated wall and ceiling applications. It has a fire-resistant gypsum core encased in a heavy, natural finish with 100-percent recycled paper on the face and back sides. The face paper is folded around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth.</p>	<p>Thickness: 1/4" (6.4 mm) / Regular 3/8" (9.5 mm) / Regular 1/2" (12.7 mm) / Regular</p> <p>Width: 4' (1,219 mm) 1/2" also available in 54" (1,372 mm)</p> <p>Length: 8' – 12' (2,438 – 3,658 mm) 1/2" also available in 16' (4,877 mm)</p> <ul style="list-style-type: none"> • Tapered, Square or Sta-Smooth® Edge • Features GridMarX® guide marks • ASTM C 1396 • Federal Specification Number: SS-L-30D Type III


Gold Bond® BRAND High Strength LITE® Gypsum Board	 <p>Use Gold Bond® BRAND High Strength LITE® for interior, non-fire-rated, single-layer wall and ceiling applications. It has a fire-resistant gypsum core with a heavy, natural finish and 100-percent recycled paper on the face and back sides. This gypsum board is formulated to be 25 percent lighter in weight than Gold Bond® BRAND 1/2 in. (12.7 mm) Gypsum Board. The result is a superior board that is both sag resistant and easier to handle. The face paper is folded around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth.</p>	<p>Thickness: 1/2" (12.7 mm) / Regular</p> <p>Width: 4' (1,219 mm), 54" (1,372 mm)</p> <p>Length: 8' – 14' (2,438 – 4,267 mm)</p> <ul style="list-style-type: none"> • Tapered or Square Edge • Features GridMarX® guide marks • ASTM C 1396 • Federal Specification Number: SS-L-30D Type III
--	--	---


Gold Bond® BRAND High Strength Ceiling Board	 <p>Use Gold Bond® BRAND High Strength Ceiling Board for interior, non-fire-rated, single-layer ceiling applications. It is a specialty gypsum board encased in 100-percent recycled paper. The increased uniformity and integrity of its gypsum core makes the sag resistance equivalent to 5/8 in. (15.9 mm) Type X Gypsum Board.</p>	<p>Thickness: 1/2" (12.7 mm) / Regular</p> <p>Width: 4' (1,219 mm)</p> <p>Length: 12' (3,658 mm)</p> <ul style="list-style-type: none"> • Tapered Edge • Features GridMarX® guide marks • ASTM C 1396 • Federal Specification Number: SS-L-30D Type III
---	--	--


Gold Bond® BRAND ThermalFOIL® Gypsum Board	 <p>Use Gold Bond® BRAND ThermalFOIL® in the interior face of exterior 2x4 (38.1 mm x 88.9 mm) wood stud walls in non-fire-rated, single-layer construction with framing members spaced up to 16 in. (406 mm) o.c. The all-in-one technology eliminates flash and batt insulation systems, helping to save money on labor costs and to improve project cycle times. This gypsum board consists of a fire-resistant gypsum core encased in a heavy, natural finish with 100-percent recycled paper on the face side and a perforated foil backing. When combined with closed-cell spray polyurethane foam insulation and a defined air space, it acts as part of a reflective insulated air space, complying with 2012 and 2015 International Energy Conservation Codes.</p>	<p>Thickness: 1/2" (12.7 mm) / Regular</p> <p>Width: 4' (1,219 mm)</p> <p>Length: 8' – 12' (2,438 – 3,658 mm)</p> <ul style="list-style-type: none"> • Tapered Edge • Features GridMarX® guide marks • ASTM C 1396
---	--	--

Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

Product	Description	Specifications
Gold Bond® BRAND Fire-Shield® Gypsum Board	 <p>Use Gold Bond® BRAND Fire-Shield® for interior, fire-rated wall and ceiling applications. A specially formulated Type C core is also available where required. This gypsum board consists of a fire-resistant gypsum core with a heavy, natural finish and 100-percent recycled paper on the face and back sides. The face paper folds around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth.</p>	<p>Thickness: 1/2" (12.7 mm) / Type C 5/8" (15.9 mm) / Type X or Type C</p> <p>Width: 1/2" Type C, 4' (1,219 mm) 5/8" Type X or Type C, 4' (1,219 mm) and 54" (1,372 mm)</p> <p>Length: 6' – 16' (1,829 – 4,877 mm)</p> <ul style="list-style-type: none"> • Tapered, Square or Sta-Smooth® Edge • Features GridMarX® guide marks • ASTM C 1396 • Federal Specification Number: SS-L-30D Type III Grade X

Gold Bond® BRAND High Strength Fire-Shield® LITE® Gypsum Board	 <p>Gold Bond® BRAND High Strength Fire-Shield® LITE® features a Type X fire-resistive core for use in laboratory tested, fire-rated assemblies. This gypsum board consists of a fire-resistant gypsum core with a heavy, natural finish and 100-percent recycled paper on the face and back sides. It is formulated to be 15 percent lighter than standard Type X Gypsum Board. The face paper is folded around the long edges to reinforce and protect the core.</p>	<p>Thickness: 5/8" (15.9 mm) / Type X</p> <p>Width: 4' (1,219 mm) 54" (1,372 mm)</p> <p>Length: 8' – 12' (2,438 – 3,658 mm)</p> <ul style="list-style-type: none"> • Tapered or Square Edge • Features GridMarX® guide marks • ASTM C 1396 • Federal Specification Number: SS-L-30D Type III Grade X
---	--	---

Gold Bond® BRAND High Strength Fire-Shield® LITE® 30 Gypsum Board	 <p>Use Gold Bond® BRAND High Strength Fire-Shield® LITE® 30 for interior, 30-minute, fire-rated or non-rated wall and ceiling applications. It consists of a fire-resistant, non-Type X gypsum core with a heavy, natural finish and 100-percent recycled paper on the face and back sides. It is specially formulated to be 30 percent lighter in weight than standard Type X Gypsum Board. The result is a superior board that is both sag resistant and easier to handle. The face paper is folded around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth.</p>	<p>Thickness: 5/8" (15.9 mm)</p> <p>Width: 4' (1,219 mm)</p> <p>Length: 8' – 12' (2,438 – 3,658 mm)</p> <ul style="list-style-type: none"> • Tapered or Square Edge • Features GridMarX® guide marks • ASTM C 1396 • Federal Specification Number: SS-L-30D Type III
--	---	---

Gold Bond® BRAND 3/4" Ultra-Shield FS® Gypsum Board	 <p>Use Gold Bond® BRAND 3/4" Ultra-Shield FS® Gypsum Board in wall partitions and shaftwall assemblies to reduce material and installation labor. The core allows one layer of 3/4" Ultra-Shield FS to replace two layers of 5/8 in. Type X in specific UL assemblies. This gypsum board consists of a fire-resistant gypsum core with a heavy, natural finish and 100-percent recycled paper on the face and back. The face paper is folded around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth. 3/4" Ultra-Shield FS® Gypsum Board with mold, mildew and moisture resistance is available by special order.</p>	<p>Thickness: 3/4" (19.1 mm) / Type UltraShield</p> <p>Width: 4' (1,219 mm)</p> <p>Length: 8' – 12' (2,438 – 3,658 mm)</p> <ul style="list-style-type: none"> • Tapered Edge • Features GridMarX® guide marks • ASTM C 1396 • Federal Specification Number: SS-L-30D Type III Grade X
--	--	--

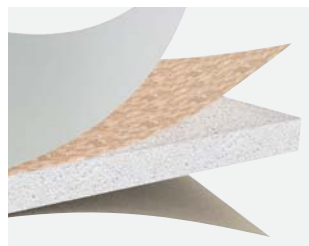
Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

Product

Description

Specifications

Gold Bond® BRAND Foil Back Gypsum Board



Use Gold Bond® BRAND Foil Back on the interior face of exterior walls and ceilings in new construction and remodeling with furred masonry, wood or steel framing. It is effective for single-layer applications and as a base layer in double-layer applications that require a vapor retarder of 1 perm or less. Foil Back has a fire-resistant gypsum core with a heavy, natural-finish paper on the face and a strong liner paper on the back. A Type III aluminum foil vapor retarder laminated to the back surface is designed to prevent condensation from occurring within the wall cavity.

Thickness: 1/2" (12.7 mm) / Regular
5/8" (15.9 mm) / Type X

Width: 4' (1,219 mm)
5/8" also available in 54" (1,372 mm)

Length: 8' – 16' (2,438 – 4,877 mm)

- Tapered or Square Edge
- Features GridMarX® guide marks
- ASTM C 1396
- Federal Specification Number: SS-L-30D Type III Form C

Gold Bond® BRAND High Flex® Gypsum Board



Use Gold Bond® BRAND High Flex® for interior, non-fire-rated wall and ceiling applications. High Flex® is ideal for concave and convex surfaces, such as walls, arches and vaulted ceilings. Apply it in double layers. This gypsum board consists of a fire-resistant gypsum core encased in a heavy, natural finish with 100-percent recycled paper on the face and back sides. The face paper is folded around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth.

Thickness: 1/4" (6.4 mm) / Regular

Width: 4' (1,219 mm)

Length: 8' (2,438 mm)

- Slightly Tapered Edge
- Features GridMarX® guide marks
- ASTM C 1396
- Federal Specification Number: SS-L-30D Type III

Gold Bond® BRAND Durasan® Prefinished Gypsum Board



Apply Durasan® Prefinished Gypsum Board directly to metal studs or as a finish layer over gypsum board. It is ideal for most demountable partition systems. Durasan® eliminates the need for joint treatment and paint, resulting in time and labor savings. It consists of a fire-resistant gypsum core in a heavy, natural finish with 100-percent recycled paper on the face and back sides and an additional vinyl covering on the panel. The long edges of all Durasan Gypsum Board are beveled and wrapped with decorative vinyl.

Thickness: 1/2" (12.7 mm) / Regular
5/8" (15.9 mm) / Type X

Width: 1/2" – 4' (1,219 mm)
5/8" – 4' (1,219 mm), 54" (1,372 mm)

Length: 8' – 10' (2,438 – 3,048 mm)

- Beveled Edge
- ASTM C 1396
- Federal Specification Number: SS-L-30D Type III Class 3, SS-L-30D Type III Grade X Class 3

Gold Bond® BRAND Gypsum Sheathing



Gold Bond® BRAND Gypsum Sheathing is a water-resistant panel installed on the outside of exterior framing as a substrate for exterior claddings. It is manufactured with a treated water-resistant core and faced with water-repellent paper on both faces and on both long edges. 5/8 in. (15.9 mm) Gypsum Sheathing has a Type X core for use in fire-rated assemblies.

Thickness: 5/8" (15.9 mm) / Type X

Width: 4' (1,219 mm)

Length: 8' – 10' (2,438 – 3,048 mm)

- Square Edge
- Features GridMarX® guide marks
- ASTM C 1396
- Federal Specification Number: SS-L-30D Type III Grade X

Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

Product	Description	Specifications
---------	-------------	----------------

Gold Bond® BRAND Fire-Shield® Shaftliner



Use Gold Bond® BRAND Fire-Shield® Shaftliner to construct lightweight fire barriers for cavity shaftwalls (1-4 hr.) and area separation fire walls (2 hr.). The long edges of Fire-Shield® Shaftliner are beveled to ease installation. This shaftliner consists of a fire-resistant Type X gypsum core encased in green, heavy paper that is 100-percent recycled on the face and back sides. The face paper is folded around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth.

Thickness: 1" (25.4 mm) / Type X
Width: 2' (610 mm)
Length: 8' – 12' (2,438 – 3,658 mm)

- Double Beveled Edge
- ASTM C1396
- Federal Specification Number: SS-L-30D Type IV Grade X

Gold Bond® BRAND Gridstone® Gypsum Ceiling Panels



Use Gold Bond® BRAND Gridstone® Gypsum Ceiling Panels in interior and unexposed exterior ceiling applications, such as soffits, parking garages, kitchens and baths. Gridstone® Gypsum Ceiling Panels are accepted by the USDA for use in food service and food processing areas. Gridstone Panels consist of a 1/2 in. (12.7 mm) non-combustible, Fire-Shield® G gypsum core with a 2-mil white, stipple-textured vinyl laminate face that combines high light reflectance with easy cleanability. Meets ASTM E1264.

Thickness: 1/2" (12.7 mm) / Type X
Width: 2' (610 mm) (Actual dimension is 23-3/4")
Length: GB 5044 – 2' (610 mm) (Actual dimension is 23-3/4")
 GB 5045 – 4' (1,219 mm) (Actual dimension is 47-3/4")

- Square Edge
- ASTM C1396

Gold Bond® BRAND Gridstone® CleanRoom Gypsum Ceiling Panels



Gold Bond® BRAND Gridstone® CleanRoom Gypsum Ceiling Panels are designed for areas requiring high levels of air cleanliness or airborne particulate levels, such as clean rooms and clean zones. They are USDA accepted for use in food service and food processing areas. Gridstone® CleanRoom Gypsum Ceiling Panels consist of a non-combustible, 1/2 in. (12.7 mm) Fire-Shield® G gypsum core with a 2-mil white, stipple-textured vinyl laminate that combines high light reflectance with easy cleanability and a clear vinyl laminate back. Meets ASTM E1264. These panels are manufactured with the exposed edges sealed, providing a durable coating that completely seals them.

Thickness: 1/2" (12.7 mm) / Type X
Width: 2' (610 mm) (Actual dimension is 23-3/4")
Length: GB 5040 – 2' (610 mm) (Actual dimension is 23-3/4")
 GB 5030 – 4' (1,219 mm) (Actual dimension is 47-3/4")

- Square Edge
- ASTM C1396

Gold Bond® BRAND Gridstone® Hi-Strength Gypsum Ceiling Panels





Use Gold Bond® BRAND Gridstone® Hi-Strength Gypsum Ceiling Panels for interior and exterior ceiling applications in protected, well-ventilated spaces that receive intermittent exposure to moisture. They are accepted by the USDA for use in food service and food processing areas. Gridstone® Hi-Strength Gypsum Ceiling Panels consist of a 5/16 in. (7.9 mm) non-combustible gypsum core with a 2-mil white, stipple-textured vinyl laminate face that combines high light reflectance with easy cleanability. The high strength gypsum core is formulated with increased uniformity and integrity that increases its sag resistance. Meets ASTM E1264.


Thickness: 5/16" (7.9 mm)
Width: 2' (610 mm) (Actual dimension is 23-3/4")
Length: GB 5020 – 2' (610 mm) (Actual dimension is 23-3/4")
 GB 5010 – 4' (1,219 mm) (Actual dimension is 47-3/4")


- Square Edge
- ASTM C1396

Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

Product	Description	Specifications
Gold Bond® BRAND Kal-Kore® Plaster Base	 <p>Use Gold Bond® BRAND Kal-Kore® Plaster Base in specific fire-rated assemblies. Kal-Kore® Plaster Base is a tapered-edge gypsum plaster base with 100-percent gray absorptive face paper surface designed to permit rapid trowel application of Kal-Kote® Basecoat, Uni-Kal® and X-KALibur® one-coat plasters.</p>	<p>Thickness: 3/8" (9.5 mm) / Regular 1/2" (12.7 mm) / Lite, Type C 5/8" (15.9 mm) / Type C, Type X</p> <p>Width: 3/8", 1/2" C – 4' (1,219 mm) 1/2" LITE, 5/8" C, 5/8" X – 4' (1,219 mm), 54" (1,372 mm)</p> <p>Length:* 8' – 12' (2,438 – 3,658 mm)</p> <ul style="list-style-type: none"> • Tapered Edge • Features GridMarX® guide marks • ASTM C 1396 • Federal Specification Number: SS-L-30D Type IV

Gold Bond® BRAND Uni-Kal® Veneer Plaster	 <p>Use Gold Bond® BRAND Uni-Kal® Smooth Finish Veneer Plaster as a single-coat application over a gypsum plaster base or as a finish coat over a gypsum plaster basecoat. Use Uni-Kal® for smooth and textured applications.</p>	<p>Packaging: 49.5 lb. (22.5 kg) / Bag</p> <p>Water Ratio: 13-15 qts. / Bag</p> <p>PSI: 1,400</p> <p>Coverage Per Bag: Approx. 135-150 sq. ft. (12-14 m²) with 3/32" (2.4 mm) applied thickness on Kal-Kore® Plaster Base</p> <p>Masonry Coverage: Approx. 70-80 sq. ft. (6.5-7.5 m²) One coat to level over masonry</p>
---	---	---

Gold Bond® BRAND X-KALibur® Extended Set Veneer Plaster	 <p>Use Gold Bond® BRAND X-KALibur® Veneer Plaster as a single-coat application over a gypsum plaster base. Or use a finish coat of X-KALibur® for interior smooth and textured application over a gypsum plaster basecoat. It has an extended setting time.</p>	<p>Packaging: 49.5 lb. (22.5 kg) / Bag</p> <p>Water Ratio: 13-15 qts. / Bag</p> <p>PSI: 1,400</p> <p>Coverage Per Bag: Approx. 135-150 sq. ft. (12-14 m²) with 3/32" (2.4 mm) applied thickness on Kal-Kore® Plaster Base</p> <p>Masonry Coverage: Approx. 70-80 sq. ft. (6.5-7.5 m²) One coat to level over masonry</p>
--	---	---

Gold Bond® BRAND Kal-Kote® Basecoat Veneer Plaster	 <p>Gold Bond® BRAND Kal-Kote® Basecoat Veneer Plaster is a high-strength basecoat veneer plaster. Apply it 1/16 in. (1.6 mm) minimum thickness over Kal-Kore® Plaster Base, masonry or monolithic concrete that has been treated with a bonding agent.</p>	<p>Packaging: 49.5 lb. (22.5 kg) / Bag</p> <p>Water Ratio: 6-8 qts. / Bag</p> <p>PSI: 2,500</p> <p>Coverage Per Bag: Approx. 93-106 sq. ft. (8.6-9.8 m²) with 1/16" (1.6 mm) applied thickness on Kal-Kore® Plaster Base</p> <p>Masonry Coverage: Approx. 50-63 sq. ft. (4.6-5.8 m²) One coat to level over masonry</p>
---	--	--

*Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

Product	Description	Specifications
---------	-------------	----------------

Gold Bond® BRAND Kal-Kote® Smooth Finish Plaster (Veneer)



Use Gold Bond® BRAND Kal-Kote® Smooth Finish Plaster for interior two-coat smooth-troweled applications over a gypsum plaster basecoat.

Packaging: 49.5 lb. (22.5 kg) / Bag
Water Ratio: 18-20 qts. / Bag
PSI: 1,000
Coverage Per Bag: Approx. 145-160 sq. ft. (13-15 m²) with 1/16" (1.6 mm) applied thickness on Kal-Kote® Basecoat

Gold Bond® BRAND Kal-Kote® Texture Finish Plaster (Veneer)



Use Gold Bond® BRAND Kal-Kote® Texture Finish Plaster for interior two-coat textured applications over a gypsum plaster basecoat.

Packaging: 49.5 lb. (22.5 kg) / Bag
Water Ratio: 11-12 qts. / Bag
PSI: 1,000
Coverage Per Bag: Approx. 145-160 sq. ft. (13-15 m²) with 1/16" (1.6 mm) applied thickness on Kal-Kote® Basecoat

Gold Bond® BRAND Two-Way Hardwall Plaster (Conventional)



Use Gold Bond® BRAND Two-Way Hardwall Plaster in interior areas as a basecoat plaster for many Gold Bond® BRAND finish plasters. It provides controlled uniformity, increased strength and fire resistance. Mechanically mixed at the jobsite, apply Two-Way Hardwall Plaster by hand or with a pump/spray plastering machine.

Packaging: 49.5 lb. (22.5 kg) / Bag
Coverage: For estimated coverage, refer to page 155.

Gold Bond® BRAND Gypsolite® Plaster (Conventional)



Use Gold Bond® BRAND Gypsolite® Plaster in interior areas as a basecoat plaster for many Gold Bond® BRAND finish plasters. It is a lightweight gypsum plaster that provides controlled uniformity, increased insulation and fire resistance. Mixed at the mill, use Gypsolite® Plaster in troweled applications over gypsum or metal lath.

Packaging: 49.5 lb. (22.5 kg) / Bag
Coverage: For estimated coverage, refer to page 156.
Water Ratio: 12-15 qts. / Bag

Product Selector

Product	Description	Specifications
---------	-------------	----------------

Gold Bond® BRAND Super-White Gauging Plaster (Conventional)



Use Gold Bond® BRAND Super-White Gauging Plaster for interior smooth-troweled applications over a gypsum plaster basecoat. Available in quick-set type or slow-set type, mix it on the jobsite with hydrated lime. Proper proportioning is essential, since gauging adds strength and hardness to the finish surface by reinforcing the plastic non-setting lime against shrinkage and cracking.

Packaging: 49.5 lb. (22.5 kg) / Bag
Coverage Approx. 113-158 sq. ft. (10.5-15 m²)
Per Bag: Based on one part plaster to two parts hydrated lime by weight.

Gold Bond® BRAND Super-White Moulding Plaster (Conventional)



Use Gold Bond® BRAND Super-White Moulding Plaster for all kinds of ornamental plaster work. Super-White Moulding Plaster's low expansion, excellent strength and hardness make it especially adaptable for casting in rubber, gelatin and other types of moulds.

Packaging: 49.5 lb. (22.5 kg) / Bag
Water Ratio: 15-18 qts. / Bag
 For casting purposes.

Gold Bond® BRAND Plaster Accelerator



Gold Bond® BRAND Plaster Accelerator provides minor adjustments to the set time for conventional and veneer plaster systems. Adding a plaster accelerator to the mix causes gypsum crystals to form at a much quicker rate.


Packaging: 1.5 lb. (0.7 kg) / Tub


Gold Bond® BRAND Plaster Retarder





Use Gold Bond® BRAND Plaster Retarder for minor to moderate lengthening of set times for plaster products. Gold Bond® Plaster Retarder slows the setting time of gypsum plasters. Due to jobsite conditions, the plastering contractor may need to alter the setting time to allow for suitable application and finishing.

Packaging: 1.67 lb. (0.8 kg) / Tub

Product	Description	Specifications
Gold Bond® BRAND XP® Gypsum Board	 <p>Use Gold Bond® BRAND XP® Gypsum Board on walls and ceilings where framing members are spaced up to 24 in. (610 mm). It is available with either a Regular, Fire-Shield® Type X or Fire-Shield® Type C gypsum core. XP® Gypsum Board consists of a mold-, mildew-, moisture- and fire-resistant core with specially designed PURPLE® paper. The PURPLE face paper is heavy, 100-percent recycled and offers superior mold, mildew and moisture resistance. The 100-percent recycled gray back paper is also mold-, mildew- and moisture-resistant.</p>	<p>Thickness: 1/2" (12.7 mm) / Regular, Type C 5/8" (15.9 mm) / Type C, Type X</p> <p>Width: 4' (1,219 mm)</p> <p>Length: 8' – 12' (2,438 – 3,658 mm)</p> <ul style="list-style-type: none"> • Tapered or Square Edge • Features GridMarX® guide marks • ASTM C 1396 • Federal Specification Number: SS-L-30D Type III Grade X

Gold Bond® BRAND 5/16" XP® Fire-Shield® Gypsum Board	 <p>Use Gold Bond® BRAND 5/16" XP® Fire-Shield® Gypsum Board to construct concave and convex corners in multi-layered applications requiring a fire-rated assembly. XP® Fire-Shield® consists of a mold-, mildew-, moisture- and fire-resistant gypsum core with a specially designed PURPLE® paper. The PURPLE paper is a heavy paper that is 100-percent recycled and offers superior mold, mildew and moisture resistance. The 100-percent recycled gray back paper is also mold-, mildew- and moisture-resistant.</p>	<p>Thickness: 5/16" (7.9 mm)</p> <p>Width: 4' (1,219 mm)</p> <p>Length: 8' (2,438 mm), 10' (3,048 mm), 12' (3,658 mm)</p> <ul style="list-style-type: none"> • Tapered Edge • Features GridMarX® guide marks • ASTM C 1396 • Federal Specification Number: SS-L-30D Type III Grade X
---	---	---

Gold Bond® BRAND Hi-Abuse® XP® Gypsum Board	 <p>Use Gold Bond® BRAND Hi-Abuse® XP® Gypsum Board for interior wall and ceiling applications. Hi-Abuse® XP® consists of a mold-, mildew-, moisture- and fire-resistant Type X gypsum core with a specially designed PURPLE® paper. The PURPLE face paper is heavy and offers superior abrasion, mold, mildew and moisture resistance. The 100-percent recycled gray back paper is also mold-, mildew- and moisture-resistant.</p>	<p>Thickness: 5/8" (15.9 mm) / Type X</p> <p>Width: 4' (1,219 mm)</p> <p>Length: 8' – 12' (2,438 – 3,658 mm)</p> <ul style="list-style-type: none"> • Tapered Edge • Features GridMarX® guide marks • ASTM C 1396 • Federal Specification Number: SS-L-30D Type III Grade X
--	--	--

Gold Bond® BRAND Hi-Impact® XP® Gypsum Board	 <p>Use Gold Bond® BRAND Hi-Impact® XP® Gypsum Board for interior wall and ceiling applications and in areas with limited water exposure. It consists of a mold-, mildew-, moisture- and fire-resistant Type X gypsum core with a specially designed PURPLE® paper. The PURPLE face paper is a heavy paper that is 100-percent recycled and offers superior abrasion, mold, mildew and moisture resistance. The 100-percent recycled gray back paper is also mold-, mildew- and moisture-resistant. Additionally, it has a fiberglass mesh embedded into the core, providing more impact and penetration resistance.</p>	<p>Thickness: 5/8" (15.9 mm) / Type X</p> <p>Width: 4' (1,219 mm)</p> <p>Length: 8' – 12' (2,438 – 3,658 mm)</p> <ul style="list-style-type: none"> • Tapered Edge • Features GridMarX® guide marks • ASTM C 1396 • Federal Specification Number: SS-L-30D Type III Grade X
---	---	--

Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

Product	Description	Specifications
---------	-------------	----------------

Gold Bond® BRAND SoundBreak® XP® Gypsum Board



Use Gold Bond® BRAND SoundBreak® XP® Gypsum Board for high Sound Transmission Class (STC) rated wall and ceiling assemblies, where sound transmission between room or dwelling units is a concern. This acoustically enhanced, fire-resistant gypsum core is encased in heavy paper that is 100-percent recycled on both sides and offers superior abrasion, mold, mildew and moisture resistance. SoundBreak® XP® consists of two pieces of high-density mold- and mildew-resistant gypsum board laminated together with a sound-damping, viscoelastic polymer with a specially designed PURPLE® paper.

- Thickness:** 1/2" (12.7 mm) / Regular
5/8" (15.9 mm) / Type X
3/4" (19.1 mm) / SoundBreak
- Width:** 1/2" and 5/8", 4' (1,219 mm)
3/4", 4' (1,219 mm)
- Length:*** 1/2" and 5/8", 8' – 12' (2,438 – 3,658 mm)
3/4", 8' – 10' (2,438 – 3,048 mm)
- Slightly Tapered Edge
 - Features GridMarX® guide marks
 - ASTM C1396, ASTM C1766
 - Federal Specification Number: SS-L-30D Type III Grade X

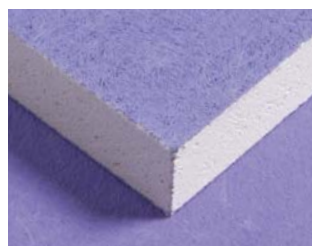
Gold Bond® BRAND Shaftliner XP® Gypsum Board



Use Gold Bond® BRAND Shaftliner XP® Gypsum Board to construct lightweight fire barriers for cavity shaftwalls (1-4 hr.) and area separation fire walls (2 hr.). Shaftliner XP® consists of a mold-, mildew-, moisture- and fire-resistant core with a specially designed, 100-percent recycled PURPLE® paper on the face and back sides. The face paper is folded around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth. Long edges are double beveled for ease of installation.

- Thickness:** 1" (25.4 mm) / Type X
- Width:** 2' (610 mm)
- Length:*** 8' – 12' (2,438 – 3,658 mm)
- Double Beveled Edge
 - Features GridMarX® guide marks
 - ASTM C1396
 - Federal Specification Number: SS-L-30D Type III Grade X

Gold Bond® BRAND EXP® Sheathing



Use Gold Bond® BRAND EXP® Sheathing for attachment to the outside of a wall and soffit framing as a substrate for exterior cladding. It is available with either a Regular or Type X gypsum core. EXP® Sheathing consists of a moisture- and mold-resistant gypsum core encased in a coated, specially designed PURPLE® fiberglass mat on the face, back and sides. The glass mat is folded around the long edges to reinforce and protect the core, and it provides superior weather resistance.

- Thickness:** 1/2" (12.7 mm) / Regular
5/8" (15.9 mm) / Type X
- Width:** 4' (1,219 mm)
- Length:*** 8' – 10' (2,438 – 3,048 mm)
- Square Edge
 - Features GridMarX® guide marks
 - ASTM C1177
 - Federal Specification Number: SS-L-30D Type II Grade X

Gold Bond® BRAND EXP® Shaftliner



Use Gold Bond® BRAND EXP® Shaftliner to construct lightweight fire barriers for cavity shaftwalls (1-4 hr.) and area separation fire walls (2 hr.). EXP® Shaftliner consists of a moisture- and mold-resistant gypsum core encased in a specially designed PURPLE® fiberglass mat on the face, back and sides. It is available in a Type X core. The glass mat is folded around the long edges to reinforce and protect the core.

- Thickness:** 1" (25.4 mm) / Type X
- Width:** 2' (610 mm)
- Length:*** 8' – 12' (2,438 – 3,658 mm)
- Double Beveled Edge
 - ASTM C1658
 - Federal Specification Number: SS-L-30D Type II Grade X

Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

Product	Description	Specifications
---------	-------------	----------------

Gold Bond® BRAND EXP® Tile Backer



Use Gold Bond® BRAND EXP® Tile Backer as a substrate for tile applications in high moisture areas, including showers, bathrooms, indoor swimming pools, laundry rooms and kitchens. It is also a code-compliant substrate for tile and other finishes in both wet and non-wet areas, areas of high humidity and fire-rated assemblies. It is ideally suited for a variety of interior applications. EXP® Tile Backer consists of a moisture- and mold-resistant gypsum core encased in a coated, specially designed fiberglass mat on the face, back and sides. The facer utilizes a gray acrylic coating for use with tile applications. It is available in either a Regular or Type X core. The glass mat is folded around the long edges to reinforce and protect the core.

Thickness: 1/2" (12.7 mm) / Regular
5/8" (15.9 mm) / Type X

Width: 4' (1,219 mm)

Length: 8' (2,438 mm)

- Square Edge
- ASTM C1178
- Federal Specification Number: SS-L-30D Type II Grade X

Gold Bond® BRAND EXP® Interior Extreme® Gypsum Panels



Use Gold Bond® BRAND EXP® Interior Extreme® Gypsum Panels wherever gypsum board is specified in interior applications for the entire project, wood or metal framing, that require increased resistance to incidental moisture. These gypsum panels consist of a moisture- and mold-resistant gypsum core encased in a coated, specially designed fiberglass mat on the face, back and sides. EXP® Interior Extreme Gypsum Panels are available in a Regular, Type X or Type C core (often specified where the weight and number of gypsum board layers are a concern). The glass mat is folded around the long edges to reinforce and protect the core.

Thickness: 1/2" (12.7 mm) / Regular, Type C
5/8" (15.9 mm) / Type C, Type X

Width: 4' (1,219 mm)

Length: 8' – 12' (2,438 – 3,658 mm)

- Tapered Edge
- ASTM C1658
- Federal Specification Number: SS-L-30D Type II Grade X

Gold Bond® BRAND EXP® Interior Extreme® Abuse Resistant (AR) Gypsum Panels



Use Gold Bond® BRAND EXP® Interior Extreme® AR Gypsum Panels for interior applications in areas prone to surface abrasion and indentation, including corridors, entryways, lobby areas and warehouses. These gypsum panels consist of an abuse-, moisture- and mold-resistant gypsum core encased in a coated, specially designed fiberglass mat on the face and back sides. In addition to providing moisture and mold resistance, the AR panel has a denser core and an enhanced glass mat for increased resistance to indentation and abrasion. The glass mat is folded around the long edges to reinforce and protect the core.

Thickness: 5/8" (15.9 mm) / Type X

Width: 4' (1,219 mm)

Length: 8' – 12' (2,438 – 3,658 mm)

- Tapered Edge
- Features GridMarX® guide marks
- ASTM C1658
- Federal Specification Number: SS-L-30D Type II Grade X

Gold Bond® BRAND EXP® Interior Extreme® Impact Resistant (IR) Gypsum Panels



Use Gold Bond® BRAND EXP® Interior Extreme® IR Gypsum Panels for interior applications requiring increased resistance to incidental moisture and wall penetrations. Use these gypsum panels in areas prone to cavity penetration. EXP® Interior Extreme® IR consist of an impact/moisture/mold-resistant gypsum core encased in a coated, fiberglass mat on the face and back sides. In addition to providing moisture and mold resistance, the IR Panel has a denser core and an enhanced glass mat for increased resistance to indentation and impact. The glass mat is folded around the long edges to reinforce and protect the core. Additionally, it has a fiberglass mesh embedded into the core, providing more impact and penetration resistance.

Thickness: 5/8" (15.9 mm) / Type X

Width: 4' (1,219 mm)

Length: 8' – 12' (2,438 – 3,658 mm)

- Tapered Edge
- Features GridMarX® guide marks
- ASTM C1658
- Federal Specification Number: SS-L-30D Type II Grade X

Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

Product Selector

Product Selector

Product	Description	Specifications
---------	-------------	----------------

PermaBase® BRAND Cement Board



Use PermaBase® BRAND Cement Board as an underlayment or backing surface in a variety of interior and exterior applications, including (but not limited to) tub and shower surrounds, countertops, flooring, and Cement Board Stucco and Masonry Veneer Wall Systems. PermaBase® Cement Board is a rigid substrate made of Portland cement, aggregate and fiberglass mesh. It has an exceptionally hard, durable surface that can withstand prolonged exposure to moisture.

- Thickness:** 1/2" (12.7 mm)
5/8" (15.9 mm)
- Width:** 32" (813 mm), 36" (914 mm),
48" (1,219 mm)
- Length:** 4' (1,219 mm), 5' (1,524 mm),
6' (1,829 mm), 8' (2,438 mm)
- Round Edge
 - ASTM C 1325

PermaBase PLUS® Cement Board



Use PermaBase PLUS® Cement Board for all interior applications and select exterior applications, such as outdoor kitchens, grills and decks. PermaBase PLUS® Cement Board is a lightweight, rigid substrate made of Portland cement, aggregate and fiberglass mesh. It provides an exceptionally hard, durable surface and is able to withstand prolonged exposure to moisture.

- Thickness:** 7/16" (11.1 mm)
- Width:** 36" (914 mm)
- Length:** 5' (1,524 mm)
- Round Edge
 - ASTM C 1325

PermaBase UltraBacker® 1/4" Cement Board Underlayment



Use PermaBase UltraBacker® 1/4" Cement Board Underlayment as an underlayment for ceramic tile on floors, countertops, tub decks and outdoor kitchen counters. PermaBase UltraBacker® is a rigid substrate made of Portland cement, aggregate and fiberglass mesh and mat facer. It provides an exceptionally hard, smooth and durable surface that is able to withstand prolonged exposure to moisture.

- Thickness:** 1/4" (6.4 mm)
- Width:** 36" (914 mm)
- Length:** 5' (1,524 mm)
- Round Edge
 - ASTM C 1325

PermaBase 1/4" Cement Board Underlayment



Use PermaBase 1/4" Cement Board Underlayment as an underlayment for ceramic tile on countertops, floors, tub decks and outdoor kitchens. PermaBase 1/4" Cement Board Underlayment is a rigid substrate made of Portland cement, aggregate and fiberglass mesh that provides an exceptionally hard, durable surface that is able to withstand prolonged exposure to moisture.

- Thickness:** 1/4" (6.4 mm)
- Width:** 36" (914 mm), 48" (1,219 mm)
- Length:** 4' (1,219 mm), 5' (1,524 mm)
- Round Edge
 - ASTM C 1325

Product	Description	Specifications
---------	-------------	----------------

PermaBase Flex® Cement Board



Use PermaBase Flex® Cement Board as a backing surface around ceilings, beams, columns, arches and archways, walls and anywhere an evenly curved surface is required. PermaBase Flex® Cement Board is a polymer-modified cement board reinforced with an alkali-resistant fiber mesh. This board is extremely flexible, making it the ideal substrate for curved applications.

Thickness: 1/2" (12.7 mm)
Width: 36" (914 mm), 48" (1,219 mm)
Length: 6' (1,829 mm), 8' (2,438 mm)

- Round Edge
- ASTM C1325

PermaBase® BRAND Fiberglass Mesh Tape



Use PermaBase® BRAND Fiberglass Mesh Tape to reinforce PermaBase® Cement Board joints and corners. It is polymer coated and alkali resistant.

Width: **For interior applications** 2" (50.8 mm)
For exterior applications 4" (102 mm)

PermaBase® BRAND Screws



Use PermaBase® BRAND Screws with PermaBase® BRAND Cement Boards. Available for both wood and metal framing, they are corrosion resistant and feature a large-diameter, low-profile head for easy and secure installation.

For wood framing:
 Use 1-1/4" (31.8 mm) or 1-5/8" (41.3 mm) long screws

For 20-gauge or heavier steel framing:
 Use Type S-12 screws or equivalent, 1-1/4" (31.8 mm) or 1-5/8" (41.3 mm) long screws

Galvanized roofing nails for wood framing:
 Use 1-1/2" (38.1 mm) long with hot-dipped galvanized coating. Nails should meet Federal Specification #FF-N105B/type 2 style 20.

ProForm® BRAND Ultra Lite®



Use ProForm® BRAND Ultra Lite® for all phases of finishing, from embedding joint tape to final coats. The lightest formula available, it weighs up to 40 percent less than standard ready mix. This formula allows more open time, provides an excellent bond, pulls and sands easily, and works well in all taping and finishing tools.

Packaging: 4.5 gal. (17 L) / Pail
 3.5 gal. (13.2 L) / Carton
 4.5 gal. (17 L) / Carton, Midwest only

Coverage: Approx. 123-140 lbs. (9 gal.) / 1,000 sq. ft.

- ASTM C475
- Federal Specification Number: SS-J-570B

Product Selector

Product

Description

Specifications

ProForm® BRAND Lite Blue



Use ProForm® BRAND Lite Blue to finish joints and cornerbead, spot fasteners and texture. ProForm® Lite Blue reduces shrinkage by up to 33 percent. It lessens pocking and pinholing, pulls and sands easily, provides a superior finish, and covers metal beads in two coats.

- Packaging:** 4.5 gal. (17 L) / Pail
3.5 gal. (13.2 L) / Carton
4.5 gal. (17 L) / Carton, Midwest only
- Coverage:** Approx. 123-140 lbs. (9 gal.) / 1,000 sq. ft.
- ASTM C475
 - Federal Specification Number: SS-J-570B

ProForm® BRAND XP® Lite with Dust-Tech®



Use ProForm® BRAND XP® Lite with Dust-Tech® to finish joints and cornerbead, spot fasteners, skim and texture, and repair cracks in plaster walls. ProForm® XP® Lite reduces airborne dust by 60 percent, reduces shrinkage by up to 33 percent, resists mold growth, provides a superior finish, and sands without clogging the sanding tool.

- Packaging:** 4.5 gal. (28 kg) / Pail
3.5 gal. (22.7 kg) / Carton
- Coverage:** Approx. 123-140 lbs. (9 gal.) / 1,000 sq. ft.
- ASTM C475
 - Federal Specification Number: SS-J-570B

ProForm® BRAND XP® with Dust-Tech®



Use ProForm® BRAND XP® with Dust-Tech® for taping, to finish joints and cornerbead, spot fasteners, skim and texture and repair cracks in plaster walls. It is great for the first phases of finishing. This formula reduces airborne dust by 60 percent, resists mold growth, applies easily and provides an excellent bond, and lessens pocking and pinholing.

- Packaging:** 61.7 lbs. (28 kg) / Pail
50 lbs. (22.7 kg) / Carton
- Coverage:** Approx. 123-140 lbs. (9 gal.) / 1,000 sq. ft.
- ASTM C475
 - Federal Specification Number: SS-J-570B

ProForm® BRAND Multi-Use



Use ProForm® BRAND Multi-Use for all phases of finishing, from embedding joint tape to final coats. ProForm® Multi-Use weighs up to 20 percent less than standard ready mix. It shrinks less than the all-purpose formula, provides an excellent bond and lessens pocking and pinholing.

- Packaging:** 4.5 gal. (17 L) / Pail
3.5 gal. (13.2 L) / Carton
- Coverage:** Approx. 123-140 lbs. (9 gal.) / 1,000 sq. ft.
- ASTM C475
 - Federal Specification Number: SS-J-570B

Product	Description	Specifications
---------	-------------	----------------

ProForm® BRAND All Purpose



Use ProForm® BRAND All Purpose for taping, to finish joints and cornerbead, spot fasteners, skim and texture and repair cracks in plaster walls. It works great for the first phases of finishing, applies easily and provides an excellent bond. ProForm® All Purpose has a highly durable surface, and lessens pocking and pinholing.

Packaging: 61.7 lbs. (28 kg) / Pail
 12 lbs. (1 gal.) (5.4 kg) / Pail
 47 lbs. (21.3 kg) / Carton
 48 lbs. (21.8 kg) / Carton
 50 lbs. (22.7 kg) / Carton
 61.7 lbs. (28 kg) / Carton

Coverage: Approx. 123-140 lbs. (9 gal.) / 1,000 sq. ft.

- ASTM C475
- Federal Specification Number: SS-J-570B

ProForm® BRAND Taping



Use ProForm® BRAND Taping for taping, to adhere cornerbead and laminate gypsum board. ProForm® Taping enhances the bond when embedding tape. It works well with automatic taping tools.

Packaging: 61.7 lbs. (28 kg) / Pail
 46 lbs. (20.8 kg) / Carton

Coverage: Approx. 123-140 lbs. (9 gal.) / 1,000 sq. ft.

- ASTM C475
- Federal Specification Number: SS-J-570B

ProForm® BRAND All Purpose Machine Grade



Use ProForm® BRAND All Purpose Machine Grade for taping, to finish joints, spot fasteners, skim and texture and repair cracks in plaster walls. This formula works great for the first phases of finishing as well as for automatic taping and finishing tools. It applies easily, provides an excellent bond, has a highly durable surface and lessens pocking and pinholing.

Packaging: 61.7 lbs. (28 kg) / Pail
 50 lbs. (22.7 kg) / Carton

Coverage: Approx. 123-140 lbs. (9 gal.) / 1,000 sq. ft.

- ASTM C475
- Federal Specification Number: SS-J-570B

ProForm® BRAND All Purpose Heavy Viscosity



Use ProForm® BRAND All Purpose Heavy Viscosity for taping, to finish joints, spot fasteners, skim and texture and repair cracks in plaster walls. ProForm® All Purpose Heavy Viscosity applies easily, provides an excellent bond, has a highly durable surface, and lessens pocking and pinholing. It is an all-purpose formula.

Packaging: 61.7 lbs. (28 kg) / Pail
 50 lbs. (22.7 kg) / Carton

Coverage: Approx. 123-140 lbs. (9 gal.) / 1,000 sq. ft.

- ASTM C475
- Federal Specification Number: SS-J-570B

Product

Description

Specifications

ProForm® BRAND Topping



Use ProForm® BRAND Topping to finish joints and cornerbead, spot fasteners and texture. ProForm® Topping spreads and sands easily, and lessens pocking and pinholing.

- Packaging:** 61.7 lbs. (28 kg) / Pail
50 lbs. (22.7 kg) / Carton
- Coverage:** Approx. 123-140 lbs. (9 gal.) / 1,000 sq. ft.
- ASTM C475
 - Federal Specification Number: SS-J-570B

ProForm® BRAND Concrete-Cover Compound



Use ProForm® BRAND Concrete-Cover Compound for many applications: to smooth and texture monolithic concrete ceilings or columns; laminate; for a first-fill coat on fastener beads or trim. It sprays, brushes, rolls and applies by trowel, gypsum board finishing boxes or taping tools.

- Packaging:** 61.7 lbs. (28 kg) / Pail
48 lbs. (21.8 kg) / Carton
61.7 lbs. (28 kg) / Carton
- Coverage:** Approx. 123-140 lbs. (9 gal.) / 1,000 sq. ft.
- ASTM C475
 - Federal Specification Number: SS-J-570B

ProForm® BRAND Tinted-Lite



ProForm® BRAND Tinted-Lite Joint Compound is a vinyl base color-tinted ready mix lightweight joint compound. Approximately 30 percent lighter than conventional ready mix, Tinted-Lite pulls and sands easier, pocks less and reduces shrinkage by up to 33 percent.

- Packaging:** 4.5 gal. (17 L) / Pail
- Coverage:** Approx. 123-140 lbs. (9 gal.) / 1,000 sq. ft.

ProForm® BRAND Paper Joint Tape



Use ProForm® BRAND Paper Joint Tape on gypsum panel joints and interior angles (crease side in); with ready mix joint compounds; and embed in joint compound, removing excess. This tape adds strength to joints, provides a superior bond, folds easily at corners and resists distortions, such as stretching, wrinkling and tearing.

- Packaging:** 75' (22.9 m) rolls, 20 rolls / Carton
250' (76.2 m) rolls, 20 rolls / Carton
500' (152.4 m) rolls, 10 rolls / Carton
- Coverage:** 375' (114 m) tape / 1,000 sq. ft. (93 m²) of gypsum board

Product	Description	Specifications
---------	-------------	----------------

ProForm® BRAND Paper Joint Tape – Heavy



Use ProForm® BRAND Paper Joint Tape – Heavy with ready mix or setting-type joint compounds and gypsum veneer systems to conceal and reinforce joints. This tape offers superior tensile strength and resists distortions, such as stretching, wrinkling and tearing.

- Packaging:** 500' (152.4 m) rolls, 10 rolls / Carton
Coverage: 500' (152.4 m) tape / 1,330 sq. ft. 124 m² of gypsum board
- ASTM C475
 - Federal Specification Number: SS-J-570B

ProForm® BRAND Fiberglass Mesh Tape



Use ProForm® BRAND Fiberglass Mesh Tape on gypsum panel joints and corners; and with setting joint compounds only (Quick Set™ or Quick Set™ Lite). Apply this tape to a joint or corner before applying the setting joint compound. ProForm® Fiberglass Mesh Tape eliminates the need for an embedding coat, resists mold and mildew and meets ASTM C475.

- Packaging:** 300' (91.4 m) rolls, 12 rolls / Carton
Coverage: 375' (114 m) tape / 1,000 sq. ft. 93 m² of gypsum board
- ASTM C475

ProForm® BRAND Multi-Flex® Tape



Use ProForm® BRAND Multi-Flex® Tape for inside and outside corners and for vaulted ceilings. Apply this tape with metal side to face of gypsum boards and embed it in joint compounds. ProForm® Multi-Flex® Tape applies easily, conceals and reinforces joints and works well for hard angles (less or greater than 90 degrees).

- Packaging:** 100' (30.5 m) rolls, 10 rolls / Carton

ProForm® BRAND Quick Set™



Use ProForm® BRAND Quick Set™ for heavy fills, to bead, trim, finish joints and laminate gypsum boards. ProForm® Quick Set™ streamlines scheduling – recoat once previous coat sets. This formula provides an excellent bond and has a highly durable surface. It also shrinks less and dries white, mixes easily and provides extra protection against mold.

- Packaging:** 25 lbs. (11.3 kg) / Bag
Coverage: Approx. 45-55 lbs. / 1,000 sq. ft. (22-29 kg / 93 m²)
Mixture per Bag: 13-14 pts. (6.2-6.6 L) clean, room temperature, drinkable water
- ASTM C475
 - Federal Specification Number: SS-J-570B

Product

Description

Specifications

ProForm® BRAND Quick Set™ Lite



Use ProForm® BRAND Quick Set™ Lite for heavy fills, to bead, trim, finish joints and laminate gypsum boards. ProForm® Quick Set™ Lite is 30 percent lighter than Quick Set™ and streamlines scheduling – recoat once previous coat sets. This formula provides an excellent bond and has a highly durable surface. It mixes and sands easily, and provides extra protection against mold.

- Packaging:** 18 lbs. (8.2 kg) / Bag
- Coverage:** Approx. 45-55 lbs. / 1,000 sq. ft. (22-29 kg / 93 m²)
- Mixture per Bag:** 11-12 pts. (5.2-5.5 L) clean, room temperature, drinkable water
- ASTM C475
- Federal Specification Number: SS-J-570B

ProForm® BRAND FS-90 Fire-Shield® Compound (Through-Penetration Fire Stop)



ProForm® BRAND FS-90 Fire-Shield® Compound meets multiple standards to qualify as UL Listed for: use in fire and smoke-stop; for through-wall and floor penetrations; and for head of wall. ProForm® FS-90 Fire-Shield Compound blocks fire and smoke and dries red for easy identification. It also saves money and reduces waste – mix only what you need for the job.

- Packaging:** 25 lbs. (11.3 kg) / Bag
- Coverage per Bag:** Approx. 850 cu. in.
- Mixture per Bag:** 12-13 pts. (5.7-6.2 L) clean, room temperature, drinkable water.
- Note: If you need less than a full bag, mix at a ratio of 2 parts dry powder to 1 part water.

ProForm® BRAND Perfect Spray® Medium (Aggregated Texture Spray)



Use ProForm® BRAND Perfect Spray® Medium on interior ceilings with new, primed or previously painted gypsum board or monolithic concrete/plaster. This formula achieves a bright white appearance, providing a bold accent and hiding minor surface defects. It also mixes easily, works with standard spray equipment, and provides low fallout.

- Packaging:** 40 lbs. (18.2 kg) / Bag
- Coverage per Bag:** Approx. 300-400 sq. ft. (27-37 m²)
- Mixture per Bag:** 3-4 gals. (11.3-15.1 L) clean, room temperature, drinkable water.
- ASTM C475
- Federal Specification Number: SS-J-570B

ProForm® BRAND Wall & Ceiling (Non-Aggregated Texture Spray)



Use ProForm® BRAND Wall & Ceiling on walls and ceilings. It applies without overspray impacting the ceiling, and you can use it on a surface finished with a coat of paint or concrete coated with an alkali-resistant primer/sealer. This formula creates a variety of textures, including spray spatter, spatter knockdown and orange peel. ProForm® Wall & Ceiling offers textures in several light-reflecting finishes, and it mixes and pumps easily.

- Packaging:** 50 lbs. (22.7 kg) / Bag
- Coverage per Bag:** Approx. 500-1,500 sq. ft. (46-136 m²)
- Mixture per Bag:** 4-5 gals. (15-19 L) clean, room temperature, drinkable water.
- ASTM C475
- Federal Specification Number: SS-J-570B

Product	Description	Specifications
---------	-------------	----------------

ProForm® BRAND All Purpose Texture Grade



ProForm® BRAND All Purpose Texture Grade works well for any non-aggregated texture and a variety of textures, including stipple, knockdown, skip trowel and orange peel. This formula allows great pattern versatility, conceals minor cracks and other imperfections, and applies easily and provides an excellent bond.

Packaging: 40 lbs. (18.2 kg) / Bag
Coverage: Approx. 123-140 lbs. (9 gal.) / 1,000 sq. ft. (93 m²)

DEXcell® BRAND Glass Mat Roof Board



Use DEXcell® BRAND Glass Mat Roof Board for a wide variety of roofing systems, including mechanically attached and ballasted single-ply membranes, thermal barriers and metal roofing. It has coated fiberglass facers and an enhanced mold-resistant gypsum core. This mold- and moisture-resistant gypsum board is a coverboard and/or thermal barrier for commercial roofing applications.

Thickness: 1/4" (6.4 mm) / Regular
 1/2" (12.7 mm)
 5/8" (15.9 mm) / Type X
Width: 4' (1,219 mm)
Length: 4' (1,219 mm), 8' (2,438 mm)
 • Square Edge
 • ASTM C1177

DEXcell® BRAND FA Glass Mat Roof Board



Use DEXcell® BRAND FA Glass Mat Roof Board for a wide variety of roofing systems, including fully adhered, modified bitumen, fluid applied, spray foam and metal roofs. It also serves as a fire barrier and thermal barrier. DEXcell FA Glass Mat Roof Board has heavy duty coated fiberglass facers and an enhanced mold-resistant gypsum core. This mold- and moisture-resistant gypsum board is a coverboard and/or thermal barrier for commercial roofing applications.

Thickness: 1/4" (6.4 mm) / Regular
 1/2" (12.7 mm)
 5/8" (15.9 mm) / Type X
Width: 4' (1,219 mm)
Length: 4' (1,219 mm), 8' (2,438 mm)
 • Square Edge
 • ASTM C1177

DEXcell® BRAND Cement Roof Board



Use DEXcell® BRAND Cement Roof Board for a variety of roofing systems, including fully adhered, mechanically attached and ballasted roofs, using single-ply membranes, modified bitumen, built-up roofing, spray foam and metal. DEXcell® Cement Roof Board provides an exceptionally hard, durable surface that withstands prolonged exposure to moisture.

Thickness: 7/16" (11.1 mm)
Width: 4' (1,219 mm)
Length: 4' (1,219 mm), 8' (2,438 mm)
 • Square Edge
 • ASTM C1325

Fire And Sound Selector

Fire and Sound Ratings

FIRE RATINGS

Fire resistance is the ability of an assembly constructed in a laboratory to contain a fire in a carefully controlled test setting for a specified period of time. ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, is the test standard for determining the fire-resistance rating of partitions, floor-ceiling assemblies, roof-ceiling assemblies, beams and columns. Fire tests may be conducted at any one of several recognized facilities.

Fire-resistance ratings represent the results of tests on assemblies made up of specific materials in a specific configuration. When selecting construction designs to meet certain fire-resistance requirements, caution must be used to ensure that each component of the assembly is the one specified in the test. Further, precaution should be taken that assembly procedures are in accordance with those of the tested assembly. **For copies of specific tests, call 1-800-NATIONAL.**

SOUND RATINGS

Gypsum board assemblies are laboratory tested to establish their sound insulation characteristics. Airborne sound insulation is reported as the Sound Transmission Class (STC). Impact noise, tested on floor-ceiling systems only, is reported as the Impact Insulation Class (IIC). ASTM E90, *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements*, is the test standard for airborne sound reduction. The test measures the sound transmission loss at 16 one-third octave frequencies to generate a single-number acoustical rating.

When selecting systems based on laboratory performance ratings, it should be understood that field conditions such as flanking paths or air leaks caused by design or workmanship can reduce acoustical performance. For this reason, National Gypsum Company cannot guarantee the performance ratings of specific assemblies in the field.

To achieve maximum sound isolation from an assembly, follow published construction details completely. Use non-hardening acoustical sealant at penetrations and floor, ceiling and wall intersections to prevent flanking paths for sound.

General Notes Regarding Fire-Rated Assemblies

1. Unless otherwise specified, the face layers of all assemblies, except those with predecorated surfaces or exterior gypsum sheathing, shall have joints taped and fastener heads treated (minimum Level 1 as specified in GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*). Base layers in multi-layer assemblies shall not be required to have joints or fasteners taped or covered with joint compound.
2. When not specified as a component of a fire-tested wall or partition assembly, mineral fiber, glass fiber, or cellulose fiber insulation of a thickness not exceeding that of the stud depth shall be permitted to be added within the stud cavity.
3. In floor-ceiling or roof-ceiling assemblies, the addition or deletion of mineral wool or glass fiber insulation in the concealed space between the ceiling membrane and the floor or roof structure could possibly reduce the fire-resistance rating. The addition of insulation to any one- or two-hour fire-resistance rated floor-ceiling or roof-ceiling assembly is permitted provided that one additional layer of gypsum board of the same type specified in the design is added to the ceiling.
4. Additional layers of gypsum board are permitted to be added to any assembly.
5. Stud sizes specified in wood- or steel-stud assemblies are minimums.
6. Stud spacings specified in wood- or steel-stud assemblies are maximums.
7. Beam, joist and truss dimensions specified in floor-ceiling or roof-ceiling assemblies are minimums.
8. Beam, joist and truss spacings specified in floor-ceiling or roof-ceiling assemblies are maximums.
9. The distance between parallel rows of studs in wood- or steel-stud assemblies are minimums.
10. Ceilings supported directly from structural members are permitted to be suspended provided the in place stiffness is equivalent to the tested assembly.

The following gypsum board system details are intended solely as technical support incident to the sale and use of National Gypsum Company products. They may be used as a reference by architects, engineers, other design professionals, contractors, building code officials, or other competent construction industry trade personnel considering the selection, specification and use of National Gypsum Company products in these systems.

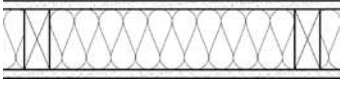
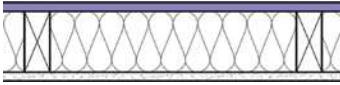
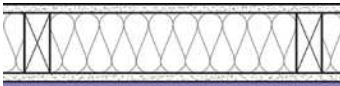
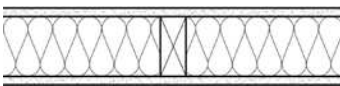
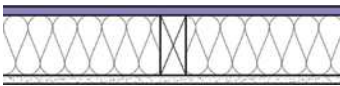
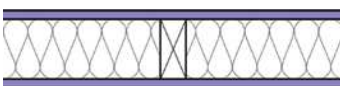
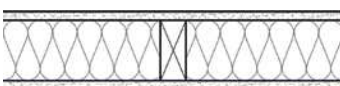
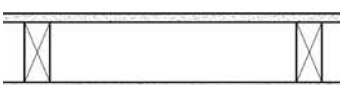
Architects, engineers, designers or contractors involved should review these details with the governing code or inspection official at the time of the job submittal to determine if there are any discrepancies with local code or regulatory requirements. In any event, they must NOT be used without a complete evaluation by the owner's design professional to verify the suitability of the system for a given application.

These system details may be printed and/or transferred electronically as needed by the user, subject to terms and limitations of any applicable license agreement. Any unauthorized duplication or reuse of the material contained herein is a violation of law.

For fire-safety information relating to certain systems described in this guide, please refer to the information on National Gypsum Company's website at:

<http://nationalgypsum.com/ng/resources/fire-safety.htm>.

Fire And Sound Selector

GYPSUM BOARD PARTITIONS – WOOD FRAMING (LOAD BEARING)					
Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
1	Not Rated	N/A	 <p>1/2 in. (12.7 mm) Gold Bond Gypsum Board applied vertically to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-1/4 in. (31.8 mm) Type W screws 12 in. (305 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.</p>	36	NGC 2012051
2	Not Rated	N/A	 <p>1/2 in. (12.7 mm) SoundBreak XP Gypsum Board applied vertically to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-1/4 in. (31.8 mm) Type W screws 12 in. (305 mm) o.c. 1/2 in. (12.7 mm) Gold Bond Gypsum Board applied vertically to opposite side of studs with 1-1/4 in. (31.8 mm) Type W screws 12 in. (305 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.</p>	39	NGC 2009047
3	Not Rated	N/A	 <p>1/2 in. (12.7 mm) Gold Bond Gypsum Board applied vertically to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-1/4 in. (31.8 mm) Type W screws 12 in. (305 mm) o.c. 1/2 in. (12.7 mm) SoundBreak XP Gypsum Board applied vertically to one side of studs with 1-5/8 in. (41.3 mm) Type W screws 12 in. (305 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.</p>	43	NGC 2009040
4	Not Rated	N/A	 <p>1/2 in. (12.7 mm) Gold Bond Gypsum Board applied vertically to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 24 in. (610 mm) o.c. with 1-1/4 in. (31.8 mm) Type W screws 12 in. (305 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.</p>	42	NGC 2012065
5	Not Rated	N/A	 <p>1/2 in. (12.7 mm) SoundBreak XP Gypsum Board applied vertically to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 24 in. (610 mm) o.c. with 1-1/4 in. (31.8 mm) Type W screws 12 in. (305 mm) o.c. 1/2 in. (12.7 mm) Gold Bond Gypsum Board applied vertically to opposite side of studs with 1-1/4 in. (31.8 mm) Type W screws 12 in. (305 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.</p>	49	NGC 2009027
6	Not Rated	N/A	 <p>1/2 in. (12.7 mm) SoundBreak XP Gypsum Board applied vertically to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 24 in. (610 mm) o.c. with 1-1/4 in. (31.8 mm) Type W screws 12 in. (305 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.</p>	51	NGC 2009029
7	Not Rated	N/A	 <p>1/2 in. (12.7 mm) Gold Bond Gypsum Board applied vertically to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 24 in. (610 mm) o.c. with 1-1/4 in. (31.8 mm) Type W screws 12 in. (305 mm) o.c. 1/2 in. (12.7 mm) SoundBreak XP Gypsum Board applied vertically to one side of studs with 1-5/8 in. (41.3 mm) Type W screws 12 in. (305 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.</p>	51	NGC 2009028
8	30 Min.	W411	 <p>5/8 in. (15.9 mm) High Strength Fire-Shield LITE 30 Gypsum Board applied vertically or horizontally to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c.</p> <p>Sound rating with 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.</p>	33 34	NGC 2014046 NGC 2014045

GYPSUM BOARD PARTITIONS – WOOD FRAMING (LOAD BEARING) – CONTINUED

Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
9	30 Min.	W411	5/8 in. (15.9 mm) High Strength Fire-Shield LITE 30 Gypsum Board applied vertically or horizontally to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Resilient channels 24 in. (610 mm) o.c. applied horizontally to opposite side of studs with 1 in. (25.4 mm) Type S screws. 5/8 in. (15.9 mm) High Strength Fire-Shield LITE 30 Gypsum Board applied vertically or horizontally to channels with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	45	NGC 2014044
10	45 Min.	U317	1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-5/8 in. (41.3 mm) long, 5d coated nails 7 in. (178 mm) o.c. Joints staggered on opposite sides.	34	NGC 2161
			Sound rating with 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	36	NGC 2012051
11	45 Min.	U317	1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-5/8 in. (41.3 mm) long, 5d coated nails 7 in. (178 mm) o.c. 1/2 in. (12.7 mm) SoundBreak XP Gypsum Board applied vertically to one side with 1-1/4 in. (31.8 mm) Type S screws 16 in. (406 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	43	NGC 2009040
12	1 Hr.	U305 WP 3605	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. Joints staggered on opposite sides.	35	NGC 2403
			Sound rating with 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	36	NGC 2008029
13	1 Hr.	U305 WP 3605	5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to opposite side of studs with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	42	NGC 2009020
14	1 Hr.	U305 WP 3605	5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	45	NGC 2009019
15	1 Hr.	U305	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-1/4 in. (31.8 mm) Type W screws 8 in. (203 mm) o.c. Resilient channels 24 in. (610 mm) o.c. applied horizontally to opposite side of studs with 1-1/4 in. (31.8 mm) Type W screws. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to channel with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	51	NGC 2011071

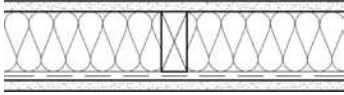
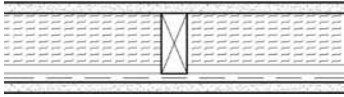
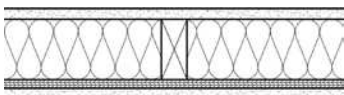
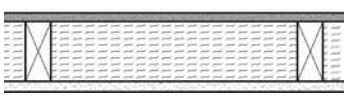

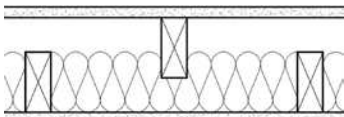
Fire And Sound Selector

GYPSUM BOARD PARTITIONS – WOOD FRAMING (LOAD BEARING) – CONTINUED

Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
16	1 Hr.	U305	5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-1/4 in. (31.8 mm) Type W screws 8 in. (203 mm) o.c. Resilient channels 24 in. (610 mm) o.c. applied horizontally to opposite side of studs with 1-1/4 in. (31.8 mm) Type W screws. 5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to channel with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	54	NGC 2011066
17	1 Hr.	U305	Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-1/4 in. (31.8 mm) Type W screws 8 in. (203 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically with 1-7/8 in. (47.6 mm) Type W screws 12 in. (305 mm) o.c. Resilient channels 24 in. (610 mm) o.c. applied horizontally to opposite side of studs with 1-1/4 in. (31.8 mm) Type W screws. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to channel with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	55	NGC 2011070
18	1 Hr.	U305	5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-1/4 in. (31.8 mm) Type W screws 8 in. (203 mm) o.c. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically with 1-7/8 in. (47.6 mm) Type W screws 12 in. (305 mm) o.c. Resilient channels 24 in. (610 mm) o.c. applied horizontally to opposite side of studs with 1-1/4 in. (31.8 mm) Type W screws. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to channel with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	58	NGC 2011067
19	1 Hr.	WP 3341	Base layer 1/4 in. (6.4 mm) Gold Bond Gypsum Board applied vertically to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-1/2 in. (38.1 mm) long, 4d coated nails 12 in. (305 mm) o.c. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to each side with 1/4 in. (6.4 mm) beads of laminating compound 2 in. (50.8 mm) o.c. and with 1-7/8 in. (47.6 mm) long, 6d coated nails 6 in. (152 mm) o.c. at top and bottom plates. Joints staggered each layer and side.	45	NGC 2321
20	1 Hr.	U309 WP 3510	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 24 in. (610 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. Joints staggered on opposite sides.	38	NGC 2404
21	1 Hr.	U309 WP 3510	5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 24 in. (610 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to opposite side of studs with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	50	NGC 2009015
22	1 Hr.	U309 WP 3510	5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 24 in. (610 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	53	NGC 2009016

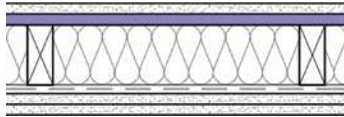
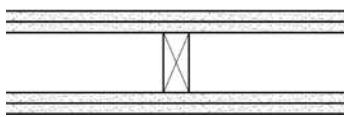
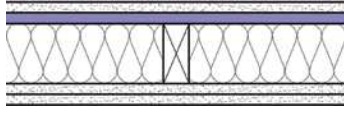
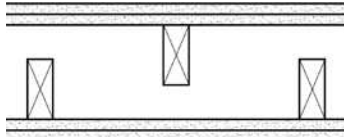
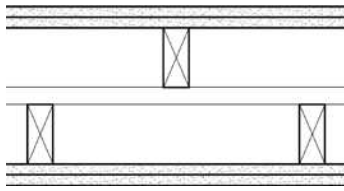
Fire / Sound Selector

GYPSON BOARD PARTITIONS – WOOD FRAMING (LOAD BEARING) – CONTINUED

Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
	1 Hr.	U309	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 24 in. (610 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. Resilient channels 24 in. (610 mm) o.c. applied horizontally to opposite side of studs with 1-1/4 in. (31.8 mm) Type W screws. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to channel with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. 3 in. (76.2 mm) glass fiber insulation between studs fastened with staples 24 in. (610 mm) o.c. Joints staggered on opposite sides.	50	NRCC TL-93-196
	1 Hr.	U311 WP 3241	5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied horizontally to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 24 in. (610 mm) o.c. with 1-1/4 in. (31.8 mm) Type W screws 12 in. (305 mm) o.c. Resilient channels 24 in. (610 mm) o.c. applied horizontally to opposite side of studs with 1-1/4 in. (31.8 mm) Type W screws. 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied horizontally to channel with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Vertical joints located between studs and back-blocked with 20 in. (508 mm) long resilient channel. Horizontal joints not required to be staggered. Vertical joints staggered on opposite sides. 3 in. (76.2 mm) mineral wool insulation between studs fastened with staples 24 in. (610 mm) o.c.		
	1 Hr.	U344	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 24 in. (610 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. 15/32 in. (11.9 mm) wood structural panels applied vertically to opposite side with 1-7/8 in. (47.6 mm) long, 6d coated nails 6 in. (152 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs with vertical joints staggered and horizontal joints backed by wood blocking. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally and fastened to studs through wood structural panels with 2-3/8 in. (60.3 mm) long, 8d coated nails 7 in. (178 mm) o.c. 3-1/2 in. (88.9 mm) foil-faced glass fiber insulation friction fit between studs.		
	1 Hr.	U392	1/2 in. (12.7 mm) PermaBase Cement Board applied vertically or horizontally to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-1/4 in. (31.8 mm) cement board screws at 8 in. (203 mm) o.c. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally to opposite side with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. 3 1/2 in. (88.9 mm) mineral fiber insulation friction fit in stud cavity.		
	1 Hr.	U340	5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied vertically or horizontally to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 24 in. (610 mm) o.c. staggered 12 in. (305 mm) on each side of 2x6 (38.1 mm x 140 mm) wood plate with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. Joints staggered on opposite sides.		
	1 Hr.	U340 WP 5513	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. staggered 8 in. (203 mm) on each side of 2x6 (38.1 mm x 140 mm) wood plate with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	45	NGC 2375

Fire And Sound Selector

GYPSUM BOARD PARTITIONS – WOOD FRAMING (LOAD BEARING) – CONTINUED					
Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
29	1 Hr.	WP 5513	5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. staggered 8 in. (203 mm) on each side of 2x6 (38.1 mm x 140 mm) wood plate with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to opposite side of studs with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. Joints staggered on opposite sides. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	53	NGC 2011003
30	1 Hr.	U341	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally to each side of double row of 2x4 (38.1 mm x 88.9 mm) wood studs 24 in. (610 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. Joints staggered on opposite sides. Sound rating with studs 16 in. (406 mm) o.c. and 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity in one row only. Sound rating with studs 16 in. (406 mm) o.c. and 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity in each row.	51 54	NGC 2191 NGC 2198
31	1 Hr.	U341	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side of double row of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. Joints staggered on opposite sides. Face layer of SoundBreak XP Gypsum Board applied vertically to one side with 2 in. (50.8 mm) Type S screws 16 in. (406 mm) o.c. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity in one row only.	64	RAL TL07-147
32	2 Hr.	U301	Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d coated nails 6 in. (152 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally with 2-3/8 in. (60.3 mm) long, 8d coated nails 8 in. (203 mm) o.c. Vertical joints located over studs. Joints staggered each layer and side. Sound rating with 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	40 41	NGC 2363 NGC 2364
33	2 Hr.	U301	Base layer 5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-1/4 in. (31.8 mm) Type W screws 8 in. (203 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side with 2-3/8 in. (60.3 mm) Type W screws 8 in. (203 mm) o.c. Vertical joints located over studs. Joints staggered each layer and side. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	45	NGC 2009017
34	2 Hr.	U301	Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-1/4 in. (31.8 mm) Type W screws 8 in. (203 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied with 2 in. (50.8 mm) Type W screws 8 in. (203 mm) o.c. Resilient channels 24 in. (610 mm) o.c. applied horizontally to opposite side with 1-1/4 in. (31.8 mm) Type W screws. Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to channels with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Vertical joints located over studs. Joints staggered each layer and side. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	58	NGC 2011069

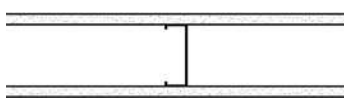
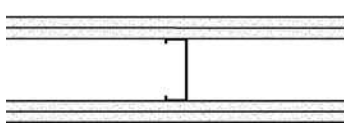
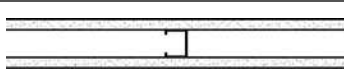
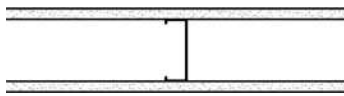
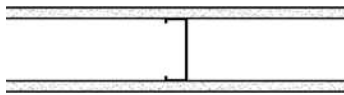
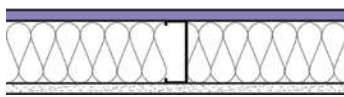
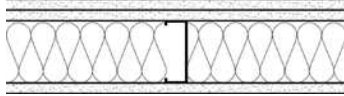
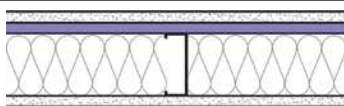
GYPSUM BOARD PARTITIONS – WOOD FRAMING (LOAD BEARING) – CONTINUED					
Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
35	2 Hr.	U301	 <p>Base layer 5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-1/4 in. (31.8 mm) Type W screws 8 in. (203 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied with 2 in. (50.8 mm) Type W screws 8 in. (203 mm) o.c. Resilient channels 24 in. (610 mm) o.c. applied horizontally to opposite side with 1-1/4 in. (31.8 mm) Type W screws. Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to channels with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Vertical joints located over studs. Joints staggered each layer and side. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.</p>	61	NGC 2011068
36	2 Hr.	WP 4135	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied horizontally to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 24 in. (610 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d coated nails 24 in. (610 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied horizontally with 2-3/8 in. (60.3 mm) long, 8d coated nails 8 in. (203 mm) o.c. Joints staggered each layer and side. Sound rating with 16 in. (406 mm) o.c. framing.</p>	40	NGC 2363
37	2 Hr.	WP 4135	 <p>Base layer 5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied horizontally to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 24 in. (610 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d coated nails 24 in. (610 mm) o.c. Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied horizontally to opposite side with 1-7/8 in. (47.6 mm) long, 6d coated nails 24 in. (610 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied horizontally to each side with 2-3/8 in. (60.3 mm) long, 8d coated nails 8 in. (203 mm) o.c. Joints staggered each layer and side. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.</p>	54	NGC 2009016
38	2 Hr.	WP 3910	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied horizontally to each side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. staggered 8 in. (203 mm) on each side of 2x6 (38.1 mm x 140 mm) wood plate with 1-7/8 in. (47.6 mm) long, 6d coated nails 24 in. (610 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied horizontally to each side with 2-3/8 in. (60.3 mm) long, 8d coated nails 8 in. (203 mm) o.c. Joints staggered each layer and side.</p>	51	NGC 2377
39	2 Hr.	WP 3820	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied horizontally to each side of double row of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. on separate plates 1 in. (25.4 mm) apart with 1-7/8 in. (47.6 mm) long, 6d coated nails 24 in. (610 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied horizontally with 2-3/8 in. (60.3 mm) long, 8d coated nails 8 in. (203 mm) o.c. Joints staggered each layer and side. Sound rating with 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.</p>	58	NGC 3056

Fire And Sound Selector

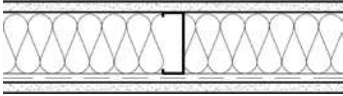
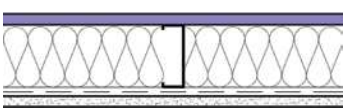
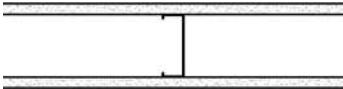

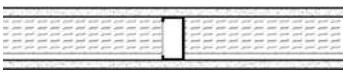
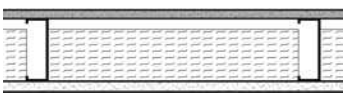
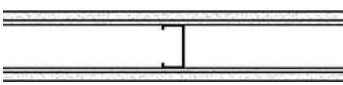
GYPSUM BOARD PARTITIONS – WOOD FRAMING (LOAD BEARING) – EXTERIOR WALLS

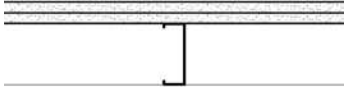
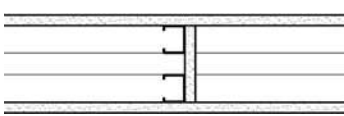
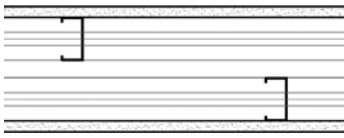
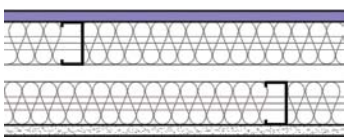
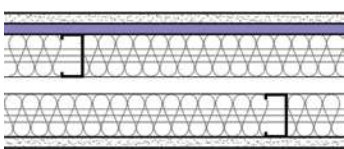
Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
40	1 Hr.	U309 WP 8105	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally to interior side of 2x4 (38.1 mm x 88.9 mm) wood studs 24 in. (610 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. 5/8 in. (15.9 mm) Gold Bond Gypsum Sheathing applied horizontally to exterior side with 1-3/4 in. (44.5 mm) galvanized roofing nails 4 in. (102 mm) o.c. at vertical joints and 7 in. (178 mm) o.c. at intermediate studs and top and bottom plates. Exterior cladding to be fastened through sheathing to studs.		
41	1 Hr.	U356	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to one side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d coated nails 7 in. (178 mm) o.c. 7/16 in. (11.1 mm) wood structural panels applied vertically or horizontally to opposite side with 1-7/8 in. (47.6 mm) long, 6d coated nails 6 in. (152 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. Vertical joints staggered and horizontal joints backed by wood blocking. 3-1/2 in. (88.9 mm) glass fiber or mineral wool insulation friction fit between studs. Vinyl, particle board, wood, aluminum or fiber-cement siding, stucco, EIFS, or brick veneer applied over wood structural panels. Fire rating from interior side only unless brick veneer is used.		
42	1 Hr.	WHI 651-0319	5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied horizontally to 2x4 (38.1 mm x 88.9 mm) wood girts 24 in. (610 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d cement-coated nails on 6x6 (140 mm x 140 mm) wood columns 8 ft. (2.44 m) o.c. Metal cladding applied vertically with 1-1/2 in. (38.1 mm) long hex-head screws to girts. 3 in. (76.2 mm) mineral fiber insulation nailed to interior of exterior girts.		
43	2 Hr.	U302 WP 8410	Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally to interior side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d coated nails 8 in. (203 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally with 2-3/8 in. (60.3 mm) long, 8d coated nails 8 in. (203 mm) o.c. Vertical joints located over studs. Joints staggered each layer. 1/2 in. (12.7 mm) Gold Bond Gypsum Sheathing applied horizontally to exterior side of wood studs with 1-3/4 in. (44.5 mm) galvanized roofing nails 6 in. (152 mm) o.c. Vertical joints located over studs and staggered between adjacent rows. Exterior clay brick veneer with 1 in. (25.4 mm) air space between brick and exterior sheathing and 20-gauge corrugated wall ties fastened to each stud with 2-3/8 in. (60.3 mm) long, 8d coated nails every 6th course.		
44	2 Hr.	U371	Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally to interior side of 2x4 (38.1 mm x 88.9 mm) wood studs 16 in. (406 mm) o.c. with 1-1/4 in. (31.8 mm) type S screws 12 in. (305 mm) o.c. Face layer applied horizontally with 2 in. (50.8 mm) Type S screws 12 in. (305 mm) o.c. 5/8 in. (15.9 mm) Gold Bond Gypsum Sheathing applied vertically or horizontally to exterior side with 1-3/4 in. (44.5 mm) galvanized roofing nails or 2 in. (50.8 mm) Type S screws, 8 in. (203 mm) o.c. Joints staggered each layer and side. Pre-furred wire stucco netting applied with 1 in. (25.4 mm) long steel staples 7 in. (178 mm) o.c. 3/4 in. (19.1 mm) Portland cement stucco applied over stucco net. 3 in. (76.2 mm) mineral wool insulation in stud cavity.		

GYPSUM BOARD PARTITIONS – STEEL FRAMING (NON-LOAD BEARING)

Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
	30 Min.	W411 WP 0703	5/8 in. (15.9 mm) High Strength Fire-Shield LITE 30 Gypsum Board applied vertically or horizontally to each side of 3-5/8 in. (92.1 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c.	36	NGC 2014006
			Sound rating with 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	46	NGC 2015005
	1 Hr.	W411	Base layer 5/8 in. (15.9 mm) High Strength Fire-Shield LITE 30 Gypsum Board applied vertically or horizontally to each side of 3-5/8 in. (92.1 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 16 in. (406 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield LITE 30 Gypsum Board applied vertically or horizontally with 1-5/8 in. (41.3 mm) Type S screws 16 in. (406 mm) o.c.	54	NGC 2014008
			Sound rating with 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	54	NGC 2014008
	1 Hr.	WP 1340	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side of 1-5/8 in. (41.3 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs.	38	NGC 2384
			Sound rating with 2-1/2 in. (63.6 mm) steel studs.	40	NGC 2438
	1 Hr.	V438 U465 WP 1081	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side of 3-5/8 in. (92.1 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs.	47	NGC 2386
			Sound rating with 2-1/2 in. (63.6 mm) glass fiber insulation in stud cavity.	47	NGC 2386
	1 Hr.	V438 U465	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied horizontally to each side of 3-5/8 in. (92.1 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c.		
	1 Hr.	V438 U465	5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to one side of 3-5/8 in. (92.1 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to opposite side of studs with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	55	OL14-0404
	1 Hr.	V438 U465 WP 1081	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side of 3-5/8 in. (92.1 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to one side with 1-5/8 in. (41.3 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. 2-1/2 in. (63.6 mm) glass fiber insulation in stud cavity.	49	NGC 2392
	1 Hr.	V438 U465 WP 1081	5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to one side of 3-5/8 in. (92.1 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to opposite side of studs with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to studs through the SoundBreak XP with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	57	RAL-TL06-334

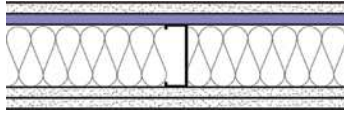
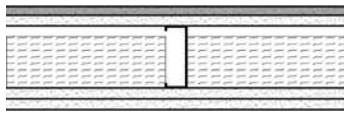
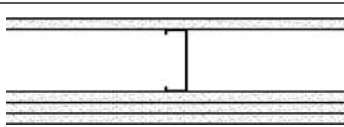
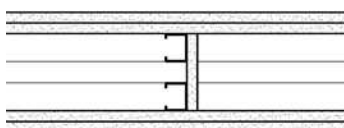
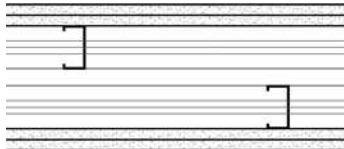
Fire And Sound Selector

GYPSUM BOARD PARTITIONS – STEEL FRAMING (NON-LOAD BEARING) – CONTINUED					
Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
9	1 Hr.	V438 U465	 <p>5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to one side of 3-5/8 in. (92.1 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. Resilient channels 24 in. (610 mm) o.c. applied horizontally to opposite side with 1/2 in. (12.7 mm) Type S-12 screws. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to channels with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.</p>	50	NGC 2013019
10	1 Hr.	V438 U465	 <p>5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to one side of 3-5/8 in. (92.1 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. Resilient channels 24 in. (610 mm) o.c. applied horizontally to opposite side with 1/2 in. (12.7 mm) Type S-12 screws. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to channels with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.</p>	54	NGC 2013020
11	1 Hr.	V450 V438 U465	 <p>5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to both sides of 3-5/8 in. (92.1 mm) steel studs 24 in. (610 mm) o.c. with 1-1/4 in. (31.8 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs.</p>	39	RAL TL05-078
12	1 Hr.	V483	 <p>5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to one side of 3-5/8 in. (92.1 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to opposite side of studs with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. 3 in. (76.2 mm) mineral fiber insulation friction fit in stud cavity.</p>	54	RAL TL07-389
13	1 Hr.	V401 V438 WP 1070 WP 1071	 <p>1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically or horizontally to each side of 2-1/2 in. (63.6 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. 2 in. (50.8 mm) mineral fiber insulation, 2.5 pcf (40 kg/m³), friction fit in stud cavity.</p>	45	NGC 2179
14	1 Hr.	V452 WP 1082	 <p>1/2 in. (12.7 mm) PermaBase Cement Board applied vertically or horizontally to one side of 3-5/8 in. (92.1 mm) steel studs 16 in. (406 mm) o.c. with 1-1/8 in. (28.6 mm) cement board screws at 8 in. (203 mm) o.c. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to opposite side with 1-1/4 in. (31.8 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. 3 in. (76.2 mm) mineral fiber insulation friction fit in stud cavity.</p>		
15	1 Hr.	WP 1051	 <p>Base layer 1/4 in. (6.4 mm) Gypsum Board applied vertically to each side of 2-1/2 in. (63.6 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to each side with 1/4 in. (6.4 mm) beads of laminating compound 2 in. (50.8 mm) o.c. to full field of face layer and 1-5/8 in. (41.3 mm) Type S screws 8 in. (203 mm) o.c. at floor and ceiling runners. Joints staggered 24 in. (610 mm) each layer and side.</p> <p>Sound rating with 2 in. (50.8 mm) glass fiber insulation in stud cavity.</p>	45 53	NGC 2328 NGC 2318

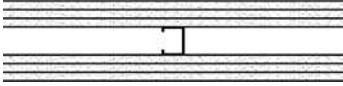
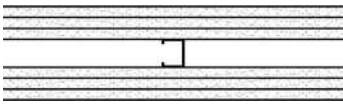
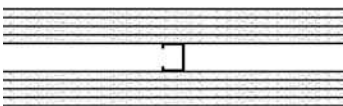
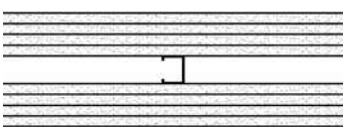
GYPSUM BOARD PARTITIONS – STEEL FRAMING (NON-LOAD BEARING) – CONTINUED					
Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
16	1 Hr.	V497	 <p>Base layer 5/8 in. (15.9 mm) Fire Shield Gypsum Board applied vertically to one side of 3-5/8 in. (92.1 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. ProForm Quick Set Joint Compound applied to base layer with 1/4 in. x 1/4 in. (6.4 mm x 6.4 mm) notched trowel producing continuous beads. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to studs with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. starting 6 in. (152 mm) from the bottom of the gypsum board.</p> <p>Sound rating with studs 16 in. (406 mm) o.c. and 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.</p>	38	NGC 2013013
17	1 Hr.	U420 WP 5015	 <p>5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to double row of 1-5/8 in. (41.3 mm) steel studs 24 in. (610 mm) o.c. and minimum 1 in. (25.4 mm) apart with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints 12 in. (305 mm) o.c. at intermediate studs. 5/8 in. (15.9 mm) gypsum board gussets 12 in. (305 mm) long and minimum 4-1/2 in. (114 mm) wide located at 1/3 points used as cross braces fastened to stud pairs with three 1 in. (25.4 mm) Type S screws at each stud. Optionally, 25-gauge minimum 4-1/2 in. (114 mm) long stud or runner pieces may be used as cross braces and applied with two 1/2 in. (12.7 mm) self-drilling screws at each end. Joints staggered on opposite sides.</p> <p>Sound rating with 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.</p>	52	TL 76-155
18	1 Hr.	V488	 <p>5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally to each side of a double row of 2-1/2 in. (63.6 mm) steel studs 24 in. (610 mm) o.c. evenly staggered between the two rows and a minimum 1 in. (25.4 mm) apart. Horizontally applied gypsum board fastened with 1 in. (25.4 mm) Type S or S-12 screws 8 in. (203 mm) o.c. in the field and 12 in. (305 mm) o.c. at floor and ceiling runners. Vertically applied gypsum board fastened with 1 in. (25.4 mm) Type S or S-12 screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs and floor and ceiling runners. Lateral bracing provided at each row of studs. Joints staggered on opposite sides.</p> <p>Sound rating with 2-1/2 in. (63.6 mm) glass fiber insulation in each stud cavity.</p>	56	NGC 2015108
19	1 Hr.	V488	 <p>5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to one side of a double row of 2-1/2 in. (63.6 mm) steel studs 24 in. (610 mm) o.c. evenly staggered between the two rows and a minimum 1 in. (25.4 mm) apart. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to opposite side with 1 in. (25.4 mm) Type S or S-12 screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs and floor and ceiling runners. Lateral bracing provided at each row of studs. Joints staggered on opposite sides. 2-1/2 in. (63.6 mm) glass fiber insulation in each stud cavity.</p>	60	NGC 2015107
20	1 Hr.	V488	 <p>5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to one side of a double row of 2-1/2 in. (63.6 mm) steel studs 24 in. (610 mm) o.c. evenly staggered between the two rows and a minimum 1 in. (25.4 mm) apart. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to opposite side with 1 in. (25.4 mm) Type S or S-12 screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs and floor and ceiling runners. Fire-Shield Gypsum Board applied vertically to studs through the SoundBreak XP with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Lateral bracing provided at each row of studs. Joints staggered on opposite sides. 2-1/2 in. (63.6 mm) glass fiber insulation in each stud cavity.</p>	62	NGC 2015110

Fire And Sound Selector

GYPSUM BOARD PARTITIONS – STEEL FRAMING (NON-LOAD BEARING) – CONTINUED					
Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
21	2 Hr.	W432	3/4 in. (19.1 mm) Ultra-Shield FS Gypsum Board applied vertically or horizontally to each side of 3-5/8 in. (92.1 mm) steel studs 24 in. (610 mm) o.c. with 1-1/4 in. (31.8 mm) Type S screws 8 in. (203 mm) o.c. 3 in. (76.2 mm) mineral fiber insulation, 2.5 pcf (40 kg/m ³), friction fit in stud cavity.	50	NGC 2015062
22	2 Hr.	V438	Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally to each side of 2-1/2 in. (63.6 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 16 in. (406 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side with 1-5/8 in. (41.3 mm) Type S screws 16 in. (406 mm) o.c. at vertical joints and intermediate studs and 12 in. (305 mm) o.c. at floor and ceiling runners. Joints staggered each layer and side.		
23	2 Hr.	V438	Base layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to each side of 1-5/8 in. (41.3 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 16 in. (406 mm) o.c. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically or horizontally with 1-5/8 in. (41.3 mm) Type S screws 16 in. (406 mm) o.c. Screws offset 8 in. (203 mm) from base layer. Joints staggered each layer and side.		
24	2 Hr.	V438 U411 WP 1548	Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side of 2-1/2 in. (63.5 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 16 in. (406 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side with 1-5/8 in. (41.3 mm) Type S screws 16 in. (406 mm) o.c. at vertical joints and intermediate studs and 12 in. (305 mm) o.c. at floor and ceiling runners. Joints staggered each layer and side. Sound rating with 3-5/8 in. (92.1 mm) steel studs and 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	56	NGC 3022
25	2 Hr.	V484	Base layer 5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to one side of 3-5/8 in. (92.1 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 16 in. (406 mm) o.c. Base layer of 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to opposite side with 1 in. (25.4 mm) Type S screws 16 in. (406 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum board applied vertically to each side with 1-5/8 in. (41.3 mm) Type S screws 16 in. (406 mm) o.c. Joints staggered each layer and side. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	60	RAL TL07-168
26	2 Hr.	V438 U412 WP 1615	Base layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to each side of 2-1/2 in. (63.5 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered each layer and side. Sound rating with 3-5/8 in. (92.1 mm) steel studs. 48 Sound rating with 3-5/8 in. (92.1 mm) steel studs and 3 in. (76.2 mm) glass fiber insulation in stud cavity. 53	48 53	NGC 2282 NGC 2288
27	2 Hr.	V450	Base layer 5/8 in. (15.9 mm) Fire-Shield or EXP Gypsum Sheathing applied vertically to both sides of 3-5/8 in. (92.1 mm) steel studs at 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 16 in. (406 mm) o.c. at vertical joints and intermediate studs and 12 in. (305 mm) o.c. at floor and ceiling runners. Face layer 5/8 in. (15.9 mm) Fire-Shield or EXP Gypsum Sheathing applied vertically with 1-5/8 in. (41.3 mm) Type S screws 16 in. (406 mm) o.c. at vertical joints and intermediate studs and 12 in. (305 mm) o.c. at floor and ceiling runners. Joints staggered each layer and side. Sound rating with 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	56	NGC 3022

GYPSUM BOARD PARTITIONS – STEEL FRAMING (NON-LOAD BEARING) – CONTINUED					
Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
28	2 Hr.	V484	 <p>Base layer 5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to one side of 3-5/8 in. (92.1 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Base layer of 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to opposite side with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered each layer and side. 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.</p>	60	RAL TL07-168
29	2 Hr.	V452 WP 1565	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield or 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to each side of 3-5/8 in. (92.1 mm) steel studs 16 in. (406 mm) o.c. with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield or 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to one side with 1-5/8 in. (41.3 mm) Type S screws 16 in. (406 mm) o.c. 1/2 in. (12.7 mm) PermaBase Cement Board applied vertically to opposite side with 1-5/8 in. (41.3 mm) cement board screws 8 in. (203 mm) o.c. 3 in. (76.2 mm) mineral fiber insulation friction fit in stud cavity. Joints staggered each layer and side.</p>		
30	2 Hr.	WP 1943 V449	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side of 3-1/2 in. (88.9 mm) steel studs 24 in. (610 mm) o.c. with 1-1/8 in. (28.6 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. Second layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to one side with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Face layer Fire-Shield Gypsum Board applied vertically to one side with 2-1/4 in. (57.2 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. Joints staggered each layer and side.</p>		
31	2 Hr.	U420 WP 5105	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side of a double row of 1-5/8 in. (41.3 mm) steel studs 24 in. (610 mm) o.c. and not less than 1 in. (25.4 mm) apart with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically with 1-5/8 in. (41.3 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. Gypsum board pieces 12 in. (305 mm) long by not less than 4-1/2 in. (114 mm) wide located at 1/3 points used as cross braces fastened to stud pairs with three 1 in. (25.4 mm) Type S screws at each end of brace. Optionally, 25-gauge studs or runner pieces not less than 4-1/2 in. (114 mm) long may be used as cross braces and fastened with two No. 8 x 1/2 in. (12.7 mm) self-drilling steel screws at each end. Joints staggered each layer and side.</p> <p>Sound rating with 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.</p>	57	TL 76-156
32	2 Hr.	V488	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally to each side of a double row of 2-1/2 in. (63.6 mm) steel studs 24 in. (610 mm) o.c. evenly staggered between the two rows with 1 in. (25.4 mm) Type S or S-12 screws 16 in. (406 mm) o.c. Face layer Fire-Shield Gypsum Board applied vertically or horizontally to each side with 1-5/8 in. (41.3 mm) Type S or S-12 screws 16 in. (406 mm) o.c. Screws offset 8 in. (203 mm) from screws in base layer. Joints staggered each layer and side.</p> <p>Sound rating with 2-1/2 in. (63.6 mm) glass fiber insulation in stud cavity on each side.</p>	64	NGC 2015112

Fire And Sound Selector

GYPSUM BOARD PARTITIONS – STEEL FRAMING (NON-LOAD BEARING) – CONTINUED					
Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
33	3 Hr.	V438	 <p>Base layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to each side of 1-5/8 in. (41.3 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Second layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to each side with 1-5/8 in. (41.3 mm) Type S screws 24 in. (610 mm) o.c. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically or horizontally to each side with 2-1/4 in. (57.2 mm) Type S screws 12 in. (305 mm) o.c. Screws offset 6 in. (152 mm) from layer below. Joints staggered each layer and side.</p> <p>Sound rating with 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.</p>	48	NGC 2631
34	3 Hr.	V438	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side of 1-5/8 in. (41.3 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Second layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side with 1-5/8 in. (41.3 mm) Type S screws 24 in. (610 mm) o.c. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally to each side with 2-1/4 in. (57.2 mm) Type S screws 12 in. (305 mm) o.c. Screws offset 6 in. (152 mm) from layer below. Joints staggered each layer and side.</p>		
35	4 Hr.	V438	 <p>Base layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to each side of 1-5/8 in. (41.3 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Second layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to each side with 1-5/8 in. (41.3 mm) Type S screws 24 in. (610 mm) o.c. Third layer: 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to each side with 2-1/4 in. (57.2 mm) Type S screws 24 in. (610 mm) o.c. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically or horizontally to each side with 2-5/8 in. (66.7 mm) Type S screws, 12 in. (305 mm) o.c. Screws offset 6 in. (152 mm) from layer below. Joints staggered each layer and side.</p> <p>Sound rating with 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.</p>	51	NGC 2633
36	4 Hr.	V438	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side of 1-5/8 in. (41.3 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Second layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side with 1-5/8 in. (41.3 mm) Type S screws 24 in. (610 mm) o.c. Third layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side with 2-5/8 in. (66.7 mm) Type S screws 24 in. (610 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally to each side with 3 in. (76.2 mm) Type S screws 12 in. (305 mm) o.c. Screws offset 6 in. (152 mm) from layer below. Joints staggered each layer and side.</p>		

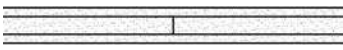
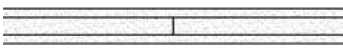

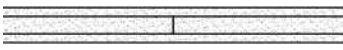
GYPSUM BOARD PARTITIONS – STEEL FRAMING (LOAD BEARING)

Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
1	1 Hr.	U425 WP 1706	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side of 3-1/2 in. (88.9 mm) 20-gauge steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S-12 screws at 12 in. (305 mm) o.c. Studs laterally braced and fastened to tracks. Joints staggered on opposite sides.		
2	2 Hr.	U425 WP 1716	Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side of 3-1/2 in. (88.9 mm) 20-gauge steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S-12 screws 12 in. (305 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to each side with 1-5/8 in. (41.3 mm) Type S-12 screws 12 in. (305 mm) o.c. Studs laterally braced and fastened to tracks. Joints staggered each layer and side.		
3	3 Hr.	U426	Base layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to each side of 3-1/2 in. (88.9 mm) 20-gauge steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S-12 screws 48 in. (1,219 mm) o.c. Second layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to each side with 1-5/8 in. (41.3 mm) Type S-12 screws 48 in. (1,219 mm) o.c. Third layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to each side with 2-1/4 in. (57.2 mm) Type S-12 screws 48 in. (1,219 mm) o.c. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically or horizontally to each side with 2-5/8 in. (66.7 mm) Type S-12 screws 12 in. (305 mm) o.c. Horizontally applied face layer fastened to inner layers with 1-1/2 in. (38.1 mm) Type G screws midway between studs. Studs laterally braced and fastened to tracks. Joints staggered each layer and side.		

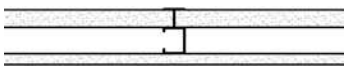
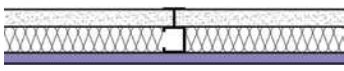
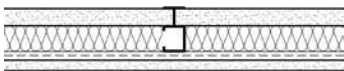
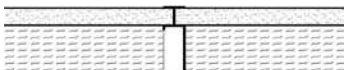
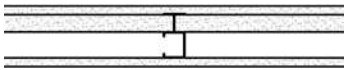
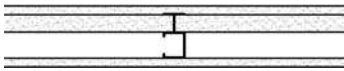
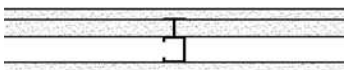
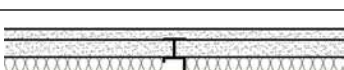
GYPSUM BOARD PARTITIONS – DURASAN PREFINISHED GYPSUM PANELS

1	1 Hr.	U405 WP 6040	5/8 in. (15.9 mm) Durasan applied vertically to each side of 2-1/2 in. (63.6 mm) steel studs 24 in. (610 mm) o.c. with steel batten retainers fastened to each stud with 1-1/4 in. (31.8 mm) Type S screws 9 in. (229 mm) o.c. Joints staggered on opposite sides.		
			Sound rating with 3 in. (76.2 mm) glass fiber insulation in stud cavity.	41	G&H NG-145FT
2	2 Hr.	U411	Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to 2-1/2 in. (63.6 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. at vertical joints and 12 in. (305 mm) o.c. at intermediate studs. Face layer 5/8 in. (15.9 mm) Durasan laminated to base layer with joint compound applied with a notched spreader producing continuous 3/8 in. (9.5 mm) beads 2 in. (50.8 mm) o.c. and fastened to floor and ceiling runners with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered each layer and side.		
			Sound rating with 3 in. (76.2 mm) glass fiber insulation in stud cavity.	56	NGC 3022

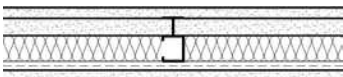
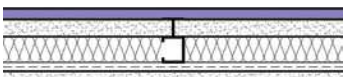
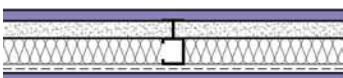
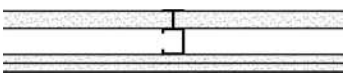
Fire And Sound Selector

SOLID GYPSUM BOARD PARTITIONS						
Item No.		Fire Rating	UL/GA Design	Description	STC	Test No.
1		1 Hr.	WP 1311	1 in. (25.4 mm) Fire-Shield Shaftliner applied to 25-gauge, 1 in. (25.4 mm) x 2-1/4 in. (57.2 mm) high steel angles along floor and ceiling with two 1-5/16 in. (33.3 mm) Type S screws at top and bottom. 1/2 in. (12.7 mm) Gold Bond Gypsum Board applied vertically to each side with ProForm Quick Set Setting Compound combed over entire contact surface and 1-5/16 in. (33.3 mm) Type S screws 24 in. (610 mm) o.c. horizontally and vertically and fastened to angles with 1-7/8 in. (47.6 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered each layer and side.	34	NGC 2359
2		2 Hr.	U525 WP 1841	1 in. (25.4 mm) Fire-Shield Shaftliner applied to 25-gauge, 1 in. (25.4 mm) x 2-1/4 in. (57.2 mm) high steel angles along floor and ceiling with two 1-5/16 in. (33.3 mm) Type S screws at top and bottom. 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to each side with ProForm Quick Set Setting Compound combed over entire contact surface and 1-5/16 in. (33.3 mm) Type S screws 24 in. (610 mm) o.c. horizontally and vertically and fastened to angles with 1-7/8 in. (47.6 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered each layer and side.	34	NGC 2359
3		2 Hr.	U505 WP 7210	22-gauge, 3/4 in. (19.1 mm) x 1-1/4 in. (31.8 mm) high steel angle along floor and 22-gauge, 3/4 in. (19.1 mm) x 1-1/4 in. (31.8 mm) x 30 in. (762 mm) long steel angles fastened to end walls and spaced maximum 5 ft. (1,524 mm) o.c. 25-gauge, 1 in. (25.4 mm) x 1-5/8 in. (41.3 mm) steel channel fastened to ceiling with one leg aligned with wall angles and oriented so the first two layers of gypsum board can be inserted into the channel. 25-gauge, 3/4 in. (19.1 mm) x 1-1/4 in. (31.8 mm) horizontal bracing angles spaced 5 ft. (1,524 mm) o.c. with 1-1/4 in. (31.8 mm) leg fastened to 1-1/4 in. (31.8 mm) leg of wall angles. Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically with top edge inserted into ceiling channel to floor, wall, and bracing angles with 1 in. (25.4 mm) Type S screws 16 in. (406 mm) o.c. Second layer 1 in. (25.4 mm) Fire-Shield Shaftliner applied vertically with top edge inserted into ceiling channel with ProForm Quick Set Setting Compound combed over entire contact surface and to floor, wall and bracing angles with 2-1/4 in. (57.2 mm) Type S-12 screws 12 in. (305 mm) o.c. Additional angles fastened to floor and end walls with 1-1/4 in. (31.8 mm) leg flat against the shaftliner panel. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically with ProForm Quick Set Setting Compound combed over entire contact surface and to ceiling channel and floor and wall angles with 1 in. (25.4 mm) Type S screws 16 in. (406 mm) o.c. Joints staggered each layer and side.		
4		2 Hr.	U529	25-gauge 1 in. (25.4 mm) x 2 in. (50.8 mm) steel angles fastened to floor, ceiling and end walls. Base layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to angles with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Second layer 1 in. (25.4 mm) Fire-Shield Shaftliner applied vertically with ProForm Quick Set Setting Compound combed over entire contact surface and 1-1/2 in. (38.1 mm) Type G screws 24 in. (610 mm) o.c. vertically and horizontally. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically with ProForm Quick Set Setting Compound combed over entire contact surface and 1-1/2 in. (38.1 mm) Type G screws 24 in. (610 mm) o.c. vertically and horizontally. Joints staggered each layer and side.		

Fire / Sound Selector

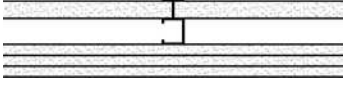
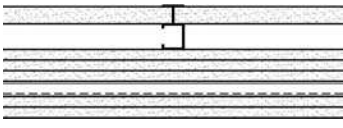
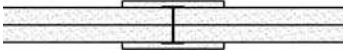
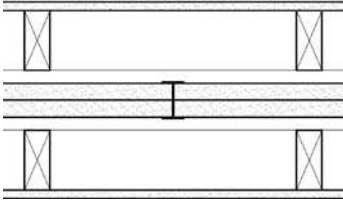
GYPSUM BOARD PARTITIONS – SHAFTWALL SYSTEMS					
Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
1	1 Hr.	W419 U499 WP 6905	 <p>1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H or I studs 24 in. (610 mm) o.c. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally to studs with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. on side opposite shaftliner panel.</p>	37	NGC 2001003
			<p>Sound rating with 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.</p>	42	NGC 2542
2	1 Hr.	W419 U499	 <p>1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H or I studs 24 in. (610 mm) o.c. 5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to studs with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. on side opposite shaftliner panel. 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.</p>	44	NGC 2015033
3	1 Hr.	W419 U499	 <p>1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H or I studs 24 in. (610 mm) o.c. Resilient channels applied horizontally to studs 24 in. (610 mm) o.c. with 1/2 in. (12.7 mm) pan-head screws on side opposite shaftliner panel. 5/8 in. (19.1 mm) Fire-Shield Gypsum Board applied vertically to channels with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.</p>	48	NGC 2541
4	2 Hr.	W441	 <p>1 in. (25.4 mm) EXP Shaftliner inserted between flanges of 4 in. (102 mm) steel C-T or C-H studs 24 in. (610 mm) o.c. 3/4 in. (19.1 mm) Ultra-Shield FS Gypsum Board applied to studs with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. on side opposite shaftliner panel. 3 in. (76.2 mm) mineral wool insulation in stud cavity.</p>	51	NGC 2015043
5	2 Hr.	U429 WP 7084	 <p>1 in. (25.4 mm) Fire-Shield Shaftliner installed between flanges of 2-1/2 in. (63.6 mm) steel C-T or C-H studs 24 in. (610 mm) o.c. 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to each side with 1 in. (25.4 mm) Type S screws at 12 in. (305 mm) o.c.</p>	42	NGC 2535
			<p>Sound rating with 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.</p>	48	NGC 2534
6	2 Hr.	W419 U498 WP 7079 ASW 1215	 <p>1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H or I studs 24 in. (610 mm) o.c. 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically or horizontally to each side of studs with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c.</p>	42	NGC 2535
			<p>Sound rating with 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.</p>	48	NGC 2534
7	2 Hr.	W419 U498 WP 7077	 <p>1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H or I studs 24 in. (610 mm) o.c. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically or horizontally to each side of studs with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered each side.</p>	42	NGC 2535
			<p>Sound rating with 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.</p>	48	NGC 2534
8	2 Hr.	W419 U498	 <p>1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H or I studs 24 in. (610 mm) o.c. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to shaftliner side of studs with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. 5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to opposite side with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered each side. 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.</p>	53	NGC 2015036

Fire And Sound Selector

GYPSUM BOARD PARTITIONS – SHAFTWALL SYSTEMS – CONTINUED					
Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
9	2 Hr.	W419 U498 WP 7062	 <p>1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H or I studs 24 in. (610 mm) o.c. 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically or horizontally to shaftliner side of studs with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Resilient channels applied horizontally to studs 24 in. (610 mm) o.c. with 1/2 in. (12.7 mm) pan-head screws on side opposite shaftliner panel. 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to channels with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered on opposite sides. 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.</p>	50	NGC 2610
10	2 Hr.	W419 U498	 <p>1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H or I studs 24 in. (610 mm) o.c. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to shaftliner side of studs with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Resilient channels applied horizontally to studs 24 in. (610 mm) o.c. with 1/2 in. (12.7 mm) pan-head screws on side opposite shaftliner panel. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to channels with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered on opposite sides. 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.</p>	52	NGC 2538
11	2 Hr.	W419 U498	 <p>1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H or I studs 24 in. (610 mm) o.c. 5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to shaftliner side of studs with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Resilient channels applied horizontally to studs 24 in. (610 mm) o.c. with 1/2 in. (12.7 mm) pan-head screws on side opposite shaftliner panel. 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to channels with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered on opposite sides. 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.</p>	55	NGC 2015041
12	2 Hr.	W419 U498	 <p>1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H or I studs 24 in. (610 mm) o.c. 5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to shaftliner side of studs with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Resilient channels applied horizontally to studs 24 in. (610 mm) o.c. with 1/2 in. (12.7 mm) pan-head screws on side opposite shaftliner panel. 5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to channels with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered on opposite sides. 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.</p>	56	NGC 2015040
13	2 Hr.	U428 WP 7051	 <p>1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T or C-H studs 24 in. (610 mm) o.c. Base layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied horizontally to studs with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. on side opposite shaftliner panel. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered each layer.</p>	40	NGC 2615
			<p>Sound rating with 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.</p>	47	NGC 2616

GYPSUM BOARD PARTITIONS – SHAFTWALL SYSTEMS – CONTINUED					
Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
14	2 Hr.	W419 U497	1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H or I studs 24 in. (610 mm) o.c. Base layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to studs with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. on side opposite shaftliner panel. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered each layer.	40	NGC 2615
			Sound rating with 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.	47	NGC 2616
15	2 Hr.	W419 U497 WP 7076	1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H or I studs 24 in. (610 mm) o.c. Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to studs with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. on side opposite shaftliner panel. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered each layer.	41	NGC 2508
			Sound rating with 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.	48	NGC 2507
16	2 Hr.	W419 U497	1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H or I studs 24 in. (610 mm) o.c. Base layer 5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to studs with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. on side opposite shaftliner panel. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered each layer. 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.	51	NGC 2015037
17	2 Hr.	W419 U497 WP 7064	1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H or I studs 24 in. (610 mm) o.c. Resilient channels applied horizontally to studs 24 in. (610 mm) o.c. with 1/2 in. (12.7 mm) pan-head screws on side opposite shaftliner panel. Base layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to channels with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered each layer. 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.	51	NGC 2609
18	2 Hr.	W419 U497	1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H or I studs 24 in. (610 mm) o.c. Resilient channels applied horizontally to studs 24 in. (610 mm) o.c. with 1/2 in. (12.7 mm) pan-head screws on side opposite shaftliner panel. Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to channels with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered each layer. 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.	51	NGC 2540
19	2 Hr.	W419 U497	1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H or I studs 24 in. (610 mm) o.c. Resilient channels applied horizontally to studs 24 in. (610 mm) o.c. with 1/2 in. (12.7 mm) pan-head screws on side opposite shaftliner panel. Base layer 5/8 in. (15.9 mm) SoundBreak XP Gypsum Board applied vertically to channels with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Joints staggered each layer.	53	NGC 2015039
	Sound rating with 1-1/2 in. (38.1 mm) glass fiber insulation in stud cavity.				

GYPSUM BOARD PARTITIONS – SHAFTWALL SYSTEMS – CONTINUED

Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
20	3 Hr.	W419 W414 WP 7493	 <p>1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H or I studs 24 in. (610 mm) o.c. Base layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied vertically to studs with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. on side opposite shaftliner panel. Second layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied vertically to studs with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Second layer fastened to base layer 2 in. (50.8 mm) from each side of vertical joints with 1-1/2 in. (38.1 mm) Type G screws 12 in. (305 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied vertically to studs with 2-1/4 in. (57.2 mm) Type S screws 12 in. (305 mm) o.c. starting 6 in. (152 mm) from the bottom of the gypsum board. Face layer fastened to inner layers 2 in. (50.8 mm) from each side of vertical joints with 1-1/2 in. (38.1 mm) Type G screws 12 in. (305 mm) o.c.</p>		
21	4 Hr.	W419 V451 WP 7691	 <p>1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel C-T, C-H, or I studs 24 in. (610 mm) o.c. Base layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied vertically to studs on side opposite shaftliner panel with 1-1/8 in. (28.6 mm) Type S screws 12 in. (305 mm) o.c. Second layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied vertically to studs with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Third layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied vertically to studs with 2-1/4 in. (57.2 mm) Type S screws 12 in. (305 mm) o.c. and fastened to inner layers of gypsum board with 1-1/2 in. (38.1 mm) Type G screws 12 in. (305 mm) o.c. centered between Type S screws. Hat-shaped furring channels applied horizontally over third layer to studs 16 in. (406 mm) o.c. with 2-1/4 in. (57.2 mm) Type S screws. Fourth layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied vertically to furring channels with 1-1/8 in. (28.6 mm) Type S screws 12 in. (305 mm) o.c. and 8 in. (203 mm) o.c. at horizontal joints. Fifth layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied vertically to furring channels with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. and 8 in. (203 mm) o.c. at horizontal joints and to fourth layer with 1-1/2 in. (38.1 mm) Type G screws 16 in. (406 mm) o.c. centered between the furring channels. Joints staggered each layer.</p>		
AREA SEPARATION FIRE WALLS					
1	2 Hr.	WHI 694-0220.6	 <p>Two layers of 1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2 in. (50.8 mm) steel H-studs 24 in. (610 mm) o.c. H-studs and tracks covered by 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board in 6 in. (152 mm) wide strips.</p>	35	NGC 2827
2	2 Hr.	U347 ASW 0988	 <p>Two layers of 1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2 in. (50.8 mm) steel H-studs 24 in. (610 mm) o.c. 3/4 in. (19.1 mm) air space each side. 2x4 (38.1 mm x 88.9 mm) wood stud partition with one layer of 1/2 in. (12.7 mm) Gold Bond Gypsum Board on each side.</p> <p>Sound rating with 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity on each side.</p>	61	RAL-TL05-199

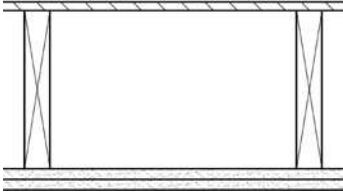
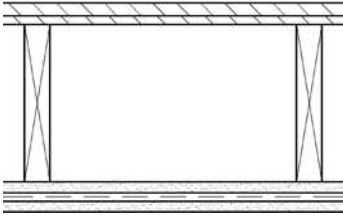
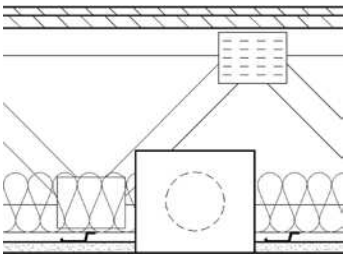
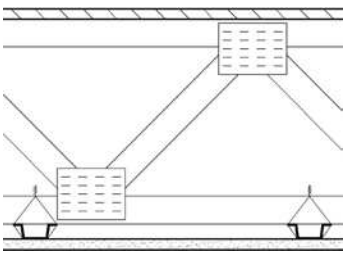
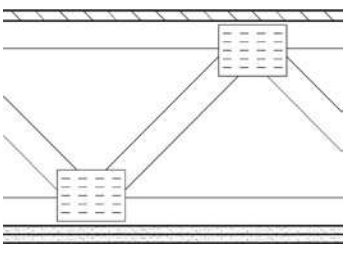
AREA SEPARATION FIRE WALLS – CONTINUED

Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
3	2 Hr.	U347	Two layers of 1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2 in. (50.8 mm) steel H-studs 24 in. (610 mm) o.c. 3/4 in. (19.1 mm) air space each side. 2x4 (38.1 mm x 88.9 mm) wood stud partition with one layer of 1/2 in. (12.7 mm) SoundBreak XP Gypsum Board on each side and 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity on each side.	65	NGC 2012081
4	2 Hr.	U347 ASW 0800	Two layers of 1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2 in. (50.8 mm) steel H-studs 24 in. (610 mm) o.c. 3/4 in. (19.1 mm) air space and adjacent construction each side. Sound rating with 2x4 (38.1 mm x 88.9 mm) wood stud partition and one layer of 5/8 in. (15.9 mm) SoundBreak XP Gypsum Board each side with 3-1/2 in. (88.9 mm) glass fiber insulation in stud cavity.	67	NRCC B-3451.1

GYPSON BOARD FLOOR/CEILING ASSEMBLIES – WOOD FRAMED

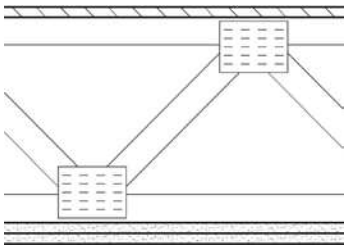
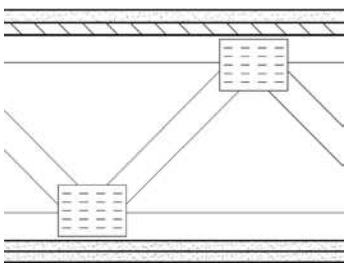
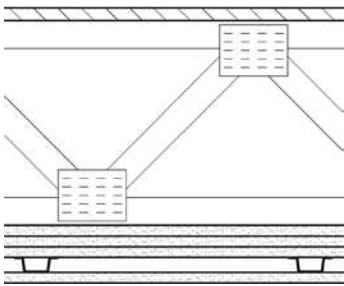
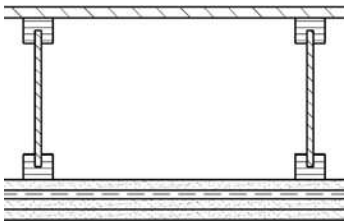
1	1 Hr.	L522 FC 5410	1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied at right angles to 2x10 (38.1 mm x 241 mm) wood joists 16 in. (406 mm) o.c. with 1-3/4 in. (44.5 mm) long, 5d nails 6 in. (152 mm) o.c. Wood joists supporting 15/32 in. (11.9 mm) wood structural panels and nominal 1 in. (25.4 mm) wood finish floor or floor topping mixture. IIC: No carpet – 32 IIC: Carpet and pad – 66	37	NGC 4084
2	1 Hr.	L501 FC 5420	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to 2x10 (38.1 mm x 241 mm) wood joists 16 in. (406 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d nails 6 in. (152 mm) o.c. Wood joists supporting 15/32 in. (11.9 mm) wood structural panels and nominal 1 in. (25.4 mm) wood finish floor or floor topping mixture. IIC: No carpet – 32 IIC: Carpet and pad – 66	37	NGC 4024
3	1 Hr.	L515 FC 5300	1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied at right angles to resilient channels 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. at ends and 12 in. (305 mm) o.c. at intermediate channels. Gypsum board end joints located midway between continuous channels and fastened to additional channels 64 in. (1.6 m) long with screws 8 in. (203 mm) o.c. Resilient channels applied at right angles to 2x10 (38.1 mm x 241 mm) wood joists 16 in. (406 mm) o.c. with 1-7/8 in. (47.6 mm) long, 6d coated nails. Wood joists supporting 15/32 in. (11.9 mm) wood structural panels and nominal 1 in. (25.4 mm) wood finish floor or floor topping mixture.	45	NGC 4010

Fire And Sound Selector

GYPSUM BOARD FLOOR/CEILING ASSEMBLIES – WOOD FRAMED – CONTINUED					
Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
4	1 Hr.	FC 5406	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to 2x10 (38.1 mm x 241 mm) wood joists 24 in. (610 mm) o.c. with 1-1/4 in. (31.8 mm) Type W or S screws 24 in. (610 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to joists with 1-7/8 in. (47.6 mm) Type W or S screws 12 in. (305 mm) o.c. at joints and intermediate joists and 1-1/2 in. (38.1 mm) Type G screws 12 in. (305 mm) o.c. placed 2 in. (50.8 mm) from each side of end joints. Joints staggered each layer. Wood joists supporting 1/2 in. (12.7 mm) plywood. Ceiling provides 1-hour fire-resistance protection for framing, including trusses.</p>		
5	2 Hr.	L505 FC 5724	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to 2x10 (38.1 mm x 241 mm) wood joists 16 in. (406 mm) o.c. with 2-1/2 in. (63.6 mm) long, 8d nails 7 in. (178 mm) o.c. Resilient channels applied at right angles to wood joists through base layer 24 in. (610 mm) o.c. with 2-1/2 in. (63.6 mm) long, 8d nails. Face layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to channels with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Wood joists supporting 15/32 in. (11.9 mm) wood structural panels and nominal 1 in. (25.4 mm) wood finish floor or floor topping mixture.</p>		
6	1 Hr.	L558 FC 5514	 <p>5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to resilient channels 12 in. (305 mm) o.c. with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. Gypsum board end joints fastened with screws 8 in. (203 mm) o.c. to additional channels 60 in. (1.5 m) long located 3 in. (76.2 mm) from end joint. Resilient channels applied at right angles to 18 in. (457 mm) deep parallel chord wood trusses 24 in. (610 mm) o.c. with 1-1/4 in. (31.8 mm) Type S or W screws. Glass fiber or mineral fiber batt or loose fill insulation installed directly over gypsum board. Wood trusses supporting 23/32 in. (18.3 mm) wood structural panels and 15/32 in. (11.9 mm) wood structural panels finish floor or floor topping mixture.</p>		
7	1 Hr.	L528 FC 5516	 <p>5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to 7/8 in. (22.2 mm) rigid furring channels 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. and 1-1/2 in. (38.1 mm) from edges. Gypsum board end joints located midway between continuous channels and fastened to additional channels 60 in. (1.5 m) long with screws 12 in. (305 mm) o.c. Rigid furring channels applied at right angles to 12 in. (305 mm) deep parallel chord wood trusses 24 in. (610 mm) o.c. with double-strand 18-gauge galvanized steel wire ties 48 in. (1,219 mm) o.c. Wood trusses supporting 23/32 in. (18.3 mm) wood structural panels.</p>		
8	1 Hr.	FC 5512	 <p>Base layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied at right angles to parallel chord wood trusses 24 in. (610 mm) o.c. with 1-1/4 in. (31.8 mm) Type S screws 24 in. (610 mm) o.c. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied at right angles to trusses with 1-7/8 in. (47.6 mm) Type S screws 12 in. (305 mm) o.c. and 1-1/2 in. (38.1 mm) Type G screws 12 in. (305 mm) o.c. placed 3 in. (76.2 mm) from each side of end joints. Joints staggered each layer. Trusses supporting 19/32 in. (15.1 mm) plywood.</p>		

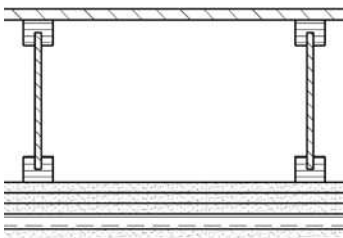
Fire / Sound Selector

GYPSUM BOARD FLOOR/CEILING ASSEMBLIES – WOOD FRAMED – CONTINUED

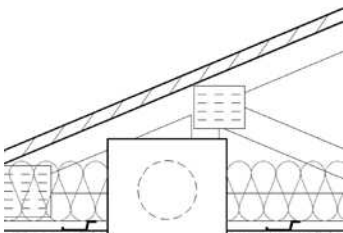
Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
9	1 Hr.	FC 5407	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to wood I-joists 24 in. (610 mm) o.c. with 1-1/4 in. (31.8 mm) Type W or S screws 24 in. (610 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to joists with 1-7/8 in. (47.6 mm) Type W or S screws 12 in. (305 mm) o.c. at joints and intermediate joists and 1-1/2 in. (38.1 mm) Type G screws 12 in. (305 mm) o.c. placed 2 in. (50.8 mm) from each side of end joints. Joints staggered each layer. Wood joists supporting 1/2 in. (12.7 mm) plywood applied at right angles to joists with 8d nails. Ceiling provides 1-hour fire-resistance protection for framing, including trusses.</p>		
10	2 Hr.	M500	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to 12 in. (305 mm) deep parallel chord wood trusses with 1-5/8 in. (41.3 mm) Type S screws 8 in. (203 mm) o.c. Resilient furring channels 12 in. (305 mm) o.c. applied at right angles to wood trusses through base layer with 1-7/8 in. (47.6 mm) Type S screws. Second layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to resilient channels with 1 in. (25.4 mm) Type S-12 screws 8 in. (203 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to resilient channels through second layer with 1-5/8 in. (41.3 mm) Type S-12 screws 8 in. (203 mm) o.c. Joints staggered each layer. Mineral wool or glass fiber insulation draped over gypsum board. Trusses supporting 23/32 in. (18.3 mm) wood structural panels and floor topping mixture.</p>		
11	2 Hr.	L556 FC 5751	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to 18 in. (457 mm) deep parallel chord wood trusses 24 in. (610 mm) o.c. with 1-1/4 in. (31.8 mm) Type W screws 12 in. (305 mm) o.c. Second layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to trusses with 2 in. (50.8 mm) Type W screws 12 in. (305 mm) o.c. Joints staggered 24 in. (610 mm) from base layer. Third layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to trusses with 2-1/2 in. (63.6 mm) Type W screws 12 in. (305 mm) o.c. Joints staggered 12 in. (50.8 mm) from second layer. 7/8 in. (22.2 mm) rigid furring channels 24 in. (610 mm) o.c. applied at right angles to trusses over third layer with two 2-1/2 in. (63.6 mm) Type W screws at each truss. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to furring channels with 1-1/8 in. (28.6 mm) Type S screws 12 in. (305 mm) o.c. Trusses supporting 3/4 in. (19.1 mm) plywood.</p>		
12	2 Hr.	L538	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to 9-1/2 in. (241 mm) wood I-joists 19.2 in. (488 mm) o.c. with 1-5/8 in. (41.3 mm) Type S screws 8 in. (203 mm) o.c. Resilient channels 16 in. (406 mm) o.c. applied at right angles to wood joists through base layer with 1-7/8 in. (47.6 mm) Type S screws at each joist. Second layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to resilient channels with 1 in. (25.4 mm) Type S-12 screws 8 in. (203 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to resilient channels through second layer with 1-5/8 in. (41.3 mm) Type S-12 screws 8 in. (203 mm) o.c. Joints staggered minimum 16 in. (406 mm) from second layer. I-joists supporting 5/8 in. (15.9 mm) wood structural panel floor applied at right angle to joists.</p>		

Fire And Sound Selector

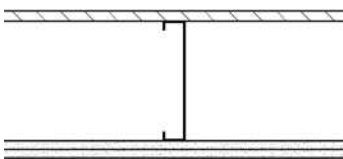
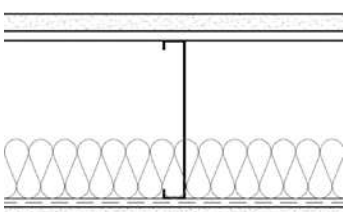
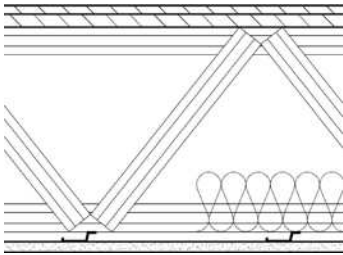
GYPSUM BOARD FLOOR/CEILING ASSEMBLIES – WOOD FRAMED – CONTINUED

Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
13	2 Hr.	L556 FC 5750	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to 9-1/2 in. (241 mm) wood I-joists 24 in. (610 mm) o.c. with 1-1/4 in. (31.8 mm) Type W screws 12 in. (305 mm) o.c. Second layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to I-joists with 2 in. (50.8 mm) Type W screws 12 in. (305 mm) o.c. Joints staggered 24 in. (610 mm) from base layer. Third layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to I-joists with 2-1/2 in. (63.6 mm) Type W screws 12 in. (305 mm) o.c. Joints staggered 12 in. (305 mm) from second layer. 7/8 in. (22.2 mm) rigid furring channels 24 in. (610 mm) o.c. applied at right angles to I-joists over third layer with two 2-1/2 in. (63.6 mm) Type W screws at each truss. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to furring channels with 1-1/8 in. (28.6 mm) Type S screws 12 in. (305 mm) o.c. I-joists supporting 3/4 in. (19.1 mm) plywood.</p>		

GYPSUM BOARD ROOF/CEILING ASSEMBLIES – WOOD FRAMED

1	1 Hr.	P533 RC 2603	 <p>5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to resilient channels 12 in. (305 mm) o.c. with 1-1/8 in. (28.6 mm) Type S screws 8 in. (203 mm) o.c. Resilient channels applied at right angles to bottom chord of wood trusses 24 in. (610 mm) o.c. with 1-1/4 in. (31.8 mm) Type S screws. Glass fiber insulation draped over the back of the channels. Wood trusses supporting 15/32 in. (11.9 mm) wood structural panels.</p>		
---	-------	-----------------	---	--	--

GYPSUM BOARD FLOOR/CEILING ASSEMBLIES – STEEL FRAMED

1	1 Hr.	L524 FC 4502	 <p>Base layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied at right angles to 7 in. (178 mm) deep, 18-gauge steel joists 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S-12 screws 8 in. (203 mm) o.c. at ends and 12 in. (305 mm) o.c. at intermediate joists. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied at right angles to joists with 1-1/2 in. (38.1 mm) Type G screws 8 in. (203 mm) o.c. at ends located between joists and 1-5/8 in. (41.3 mm) Type S-12 screws 12 in. (305 mm) o.c. at joists. Joints offset from base layer joints. Steel joists supporting 19/32 in. (15.1 mm) wood structural panels.</p>		
2	1 Hr.	G560	 <p>5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to resilient channels 12 in. (305 mm) o.c. with 1 in. (25.4 mm) Type S screws 1-1/2 in. (38.1 mm) and 4 in. (102 mm) from board edges and 8 in. (203 mm) o.c. in the field. Resilient channels fastened to 9-1/4 in. (235 mm) deep, steel joists 24 in. (610 mm) o.c. with 1/2 in. (12.7 mm) Type S screws. Joists supporting 9/16 in. (14.3 mm) steel deck and floor topping mixture.</p>		
3	1 Hr.	L565 FC 4515	 <p>5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to resilient channels 16 in. (406 mm) o.c. with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Gypsum board end joints fastened to additional channels 60 in. (1,524 mm) long with screws 12 in. (305 mm) o.c. located 3 in. (76.2 mm) from end joint. Resilient channels applied at right angles to light gauge steel trusses 48 in. (1,219 mm) o.c. with 1/2 in. (12.7 mm) Type S-12 screws. Steel trusses supporting 23/32 in. (18.3 mm) wood structural panels and 15/32 in. (11.9 mm) wood structural panel finish floor or floor topping mixture. Optional mineral wool or glass fiber insulation draped over resilient channels. Resilient channels spaced 12 in. (305 mm) o.c. when insulation is used.</p>		

GYPSUM BOARD FLOOR/CEILING ASSEMBLIES – STEEL FRAMED – CONTINUED

Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
4	1 Hr.	FC 1105	1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied at right angles to 3-5/8 in. (92.1 mm) steel studs 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Studs fastened to steel bar joists 24 in. (610 mm) o.c. with wire ties 8ft. (2.4 m) o.c. 3/8 in. (9.5 mm) rib lath supporting 2-1/2 in. (63.6 mm) concrete slab.		
5	1-1/2 Hr.	L527	Base layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to resilient channels with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to channels through base layer with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Edge joints offset 16 in. (406 mm) from base layer joints. Butt joints of face layer fastened to base layer between resilient channels with 1-1/2 in. (38.1 mm) Type G screws 8 in. (203 mm) o.c. Resilient channels 16 in. (406 mm) o.c. applied at right angles to 9-3/8 in. (238 mm) deep, 16-gauge steel joists with 1/2 in. (12.7 mm) Type S-12 pan-head screws 24 in. (610 mm) o.c. Steel joists supporting 3/4 in. (19.1 mm) plywood.		
6	1-1/2 Hr.	G259 FC 1290	2 ft. x 4 ft. (610 mm x 1,219 mm) Gridstone Gypsum Ceiling Panels laid in fire-rated metal grid system suspended from steel joists supporting 2-1/2 in. (63.6 mm) concrete slab.		
7	2 Hr.	L556 FC 4750	Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to 8 in. (203 mm) deep, 18-gauge steel joists 24 in. (610 mm) o.c. with 1-1/4 in. (31.8 mm) Type S-12 screws 12 in. (305 mm) o.c. Second layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to joists with 2 in. (50.8 mm) Type S-12 screws 12 in. (305 mm) o.c. Joints staggered 24 in. (102 mm) from base layer. Third layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to joists with 2-1/2 in. (63.6 mm) Type S-12 screws 12 in. (305 mm) o.c. Joints staggered 12 in. (305 mm) from second layer. 7/8 in. (22.2 mm) rigid furring channels 24 in. (610 mm) o.c. applied at right angles to joists over third layer with two 2-1/2 in. (63.6 mm) Type S-12 screws at each truss. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to furring channels with 1-1/8 in. (28.6 mm) Type S screws 12 in. (305 mm) o.c. Steel joists supporting 3/4 in. (19.1 mm) plywood.		

Fire And Sound Selector

GYPSUM BOARD FLOOR/CEILING ASSEMBLIES – STEEL FRAMED – CONTINUED					
Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
8	2 Hr.	G503	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to rigid furring channels 12 in. o.c. (305 mm) with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. Furring channels fastened to or suspended from steel bar joists 24 in. (610 mm) o.c. Bar joists supporting 2-1/2 in. (63.6 mm) concrete slab.		
9	2 Hr.	G563	5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to resilient channels 12 in. (305 mm) o.c. with 1 in. (25.4 mm) Type S screws 8 in. (203 mm) o.c. Resilient channels fastened to 9-1/4 in. (235 mm) deep proprietary steel joists. Joists supporting steel deck and floor topping mixture.		
10	2 Hr.	G514 FC 2030	1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied at right angles to rigid furring channels 24 in. (610 mm) o.c. with 1 in. (25.4 mm) type S screws 12 in. (305 mm) o.c. Furring channels fastened to or suspended from steel bar joists 24 in. (610 mm) o.c. with wire ties 48 in. (1,219 mm) o.c. Bar joists supporting 2-1/2 in. (63.6 mm) concrete slab. IIC: No carpet – 21 IIC: Carpet and pad – 67	53	NGC 4075
11	2 Hr.	G523	1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied at right angles to cross tees of metal suspension system with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Ceiling grid suspended from steel bar joists 24 in. (610 mm) o.c. supporting 2-1/2 in. (63.6 mm) concrete slab.		
12	2 Hr.	D502	5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to cross tees of metal suspension system with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Ceiling grid suspended from 2-1/2 in. (63.6 mm) concrete slab on steel deck.		

Fire / Sound Selector

GYPSUM BOARD FLOOR/CEILING ASSEMBLIES – STEEL FRAMED – CONTINUED

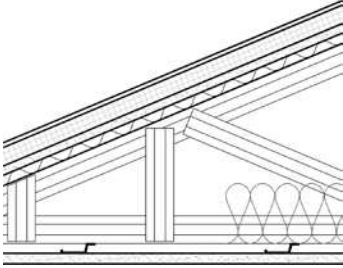
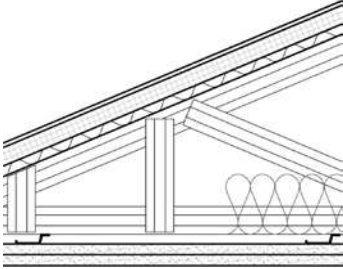
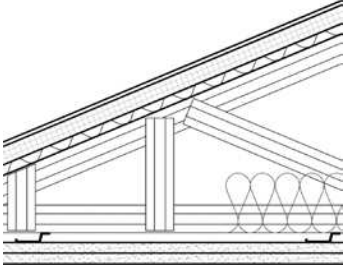
Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
13	2 Hr.	G222 FC 2190	2 ft. x 2 ft. (610 mm x 610 mm) Gridstone Gypsum Ceiling Panels laid in fire-rated metal grid system suspended from steel joists supporting 2-1/2 in. (63.6 mm) concrete slab.		
14	3 Hr.	G512 FC 3012	5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to rigid furring channels 24 in. (610 mm) o.c. with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Furring channels fastened to bar joists 24 in. (610 mm) o.c. with wire ties. Bar joists supporting 2-1/2 in. (63.6 mm) concrete slab.		

HORIZONTAL SHAFTWALL MEMBRANES AND DUCT PROTECTION SYSTEMS

1	2 Hr.	WHI 694-0300.1	1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 2-1/2 in. (63.6 mm) steel I-studs 24 in. (610 mm) o.c. Base layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied parallel to studs with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Second layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied parallel to studs with 1-5/8 in. (41.3 mm) o.c. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied at right angles to studs with 2-1/4 in. (57.2 mm) Type S screws 12 in. (305 mm) o.c.		
2	2 Hr.	G586	1 in. (25.4 mm) Fire-Shield Shaftliner inserted between flanges of 4 in. (102 mm) steel C-T studs 24 in. (610 mm) o.c. C-T studs supported by J-Tracks fastened to each side of 6 in. (152 mm) steel track 8 ft. (2.4 m) o.c. 6 in. (152 mm) steel track suspended from deck with 8-gauge steel wires. 2 in. x 6 in. (50.8 mm x 152 mm) strips of mineral wool insulation draped over J-Tracks on each side of 6 in. (152 mm) track. Base layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to studs with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Second layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to studs with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied with long dimension parallel to studs with 2-1/4 in. (57.2 mm) Type S screws 12 in. (305 mm) o.c.		

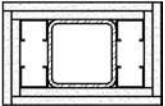
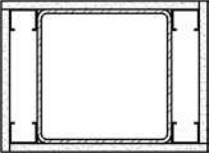
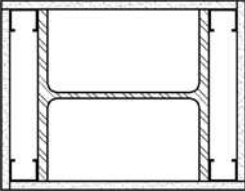
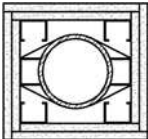
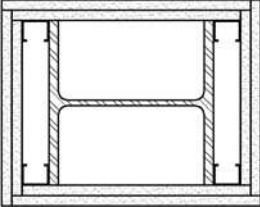
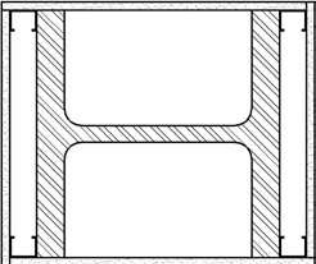
Fire And Sound Selector

GYPSUM BOARD ROOF/CEILING ASSEMBLIES – STEEL FRAMED

Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
1	1 Hr.	P540 RC 2501	 <p>5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to resilient channels 16 in. (406 mm) o.c. with 1-1/8 in. (28.6 mm) Type S screws 12 in. (305 mm) o.c. Gypsum board end joints fastened to additional channels 60 in. (1.5 m) long with screws 12 in. (305 mm) o.c. located 3 in. (76.2 mm) from end joint. Resilient channels fastened to steel trusses 48 in. (1,219 mm) o.c. with 1/2 in. (12.7 mm) S-12 screws. Resilient channels spaced 12 in. (305 mm) o.c. when insulation is used. Steel trusses supporting steel roof deck covered by 1/2 in. (12.7 mm) Gold Bond Gypsum Sheathing. Insulation boards laid over gypsum sheathing and covered with a class A, B or C roofing system. Optional mineral wool or glass fiber insulation draped over resilient channels. Resilient channels spaced 12 in. (305 mm) o.c. when insulation is used.</p>		
2	1 Hr.	P541	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied at right angles to resilient channels 24 in. (610 mm) o.c. with 1-1/8 in. (28.6 mm) Type S screws 8 in. (203 mm) o.c. at ends and 12 in. (305 mm) o.c. at intermediate channels. Gypsum board end joints fastened to additional channels extending 3 in. (76.2 mm) beyond ends of end joints. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied with long dimension perpendicular to channels with 1-3/4 in. (44.5 mm) Type S screws 8 in. (203 mm) o.c. Resilient channels fastened to steel trusses 48 in. (1,219 mm) o.c. with 1/2 in. (12.7 mm) Type S screws 8 in. (203 mm) o.c. Steel trusses supporting steel roof deck and covered with a class A, B or C roofing system. Optional mineral wool or glass fiber insulation draped over resilient channels. Resilient channels spaced 12 in. (305 mm) o.c. when insulation is used.</p>		
3	2 Hr.	P543 FC 2752	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board applied at right angles to resilient channels 16 in. (406 mm) o.c. with 1-1/8 in. (28.6 mm) Type S screws 12 in. (305 mm) o.c. Face layer Fire-Shield C Gypsum Board applied at right angles to channels through base layer with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Resilient channels fastened to steel trusses 48 in. (1,219 mm) o.c. with 1/2 in. (12.7 mm) Type S-12 screws. Resilient channels spaced 12 in. (305 mm) o.c. when insulation is used. Steel trusses supporting steel roof deck covered by 1/2 in. (12.7 mm) Gold Bond Gypsum Sheathing. Insulation boards laid over gypsum sheathing and covered with a class A, B or C roofing system.</p>		

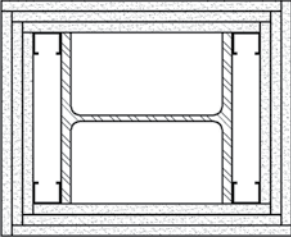
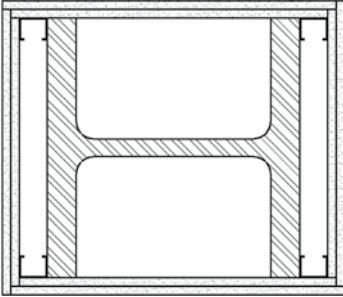
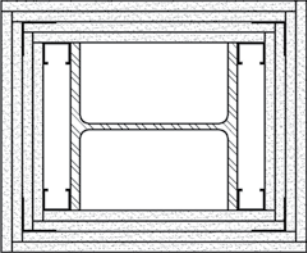
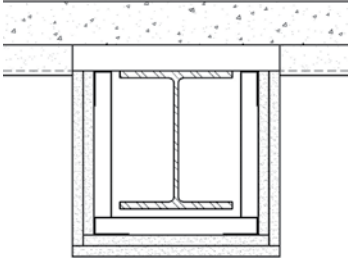
Fire / Sound Selector

GYPSUM BOARD FIREPROOFING – STEEL COLUMNS

Item No.		Fire Rating	UL/GA Design	Description	STC	Test No.
1		1 Hr.	X528 CM 1452	Base layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to 1-5/8 in. (41.3 mm) steel studs at each corner of TS 4x4x0.188 steel tube column with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically with 1-3/4 in. (44.5 mm) Type S screws 12 in. (305 mm) o.c.		
2		1 Hr.	X528 CM 1851	5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to 1-5/8 in. (41.3 mm) steel studs at each corner of TS 8x8x.250 steel tube column with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c.		
3		1 Hr.	X528 CM 1001	1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to 1-5/8 in. (41.3 mm) steel studs at each corner of W10x49 steel column with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c.		
4		1-1/2 Hr.	X531	Base layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to 1-5/8 in. (41.3 mm) steel studs at each corner of 4-1/2 in. (114 mm) OD steel pipe column with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c.		
5		2 Hr.	X528 CM 2017	Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to 1-5/8 in. (41.3 mm) steel studs at each corner of W10x49 steel column with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically with 1-3/4 in. (44.5 mm) Type S screws 12 in. (305 mm) o.c.		
6		2 Hr.	X520 CM 2110	1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to 1-5/8 in. (41.3 mm) steel studs at each corner of W14x228 steel column with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c.		

Fire And Sound Selector

GYPSUM BOARD FIREPROOFING – STEEL COLUMNS – CONTINUED

Item No.	Fire Rating	UL/GA Design	Description	STC	Test No.
7	3 Hr.	X510 CM 3120	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to 1-5/8 in. (41.3 mm) steel studs at each corner of W10x49 steel column with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Second layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. and wire tied with two strands 18-gauge wire 24 in. (610 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically with 2-1/4 in. (57.2 mm) Type S screws 12 in. (305 mm) o.c.</p>		
8	3 Hr.	X513 CM 3130	 <p>Base layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to 1-5/8 in. (41.3 mm) steel studs at each corner of W14x228 steel column with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Face layer 1/2 in. (12.7 mm) Fire-Shield C Gypsum Board applied vertically to studs with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c.</p>		
9	4 Hr.	X501	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically to 1-5/8 in. (41.3 mm) steel studs at each corner of W10x49 steel column with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. Second layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically with 1-5/8 in. (41.3 mm) Type S screws 24 in. (610 mm) o.c. 2 in. x 2 in. (50.8 mm x 50.8 mm) 25-gauge steel angles applied to corners with 1-5/8 in. (41.3 mm) Type S screws 24 in. (610 mm) o.c. Third layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically and fastened to angles with 1 in. (25.4 mm) Type S screws 12 in. (305 mm) o.c. and wire tied with two strands 18-gauge wire 24 in. (610 mm) o.c. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied vertically and fastened to angles with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c.</p>		
GYPSUM BOARD FIREPROOFING – STEEL BEAMS					
1	2 Hr.	N501 BM 2120	 <p>Base layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied with 1-1/4 in. (31.8 mm) Type S screws 16 in. (406 mm) o.c. to steel frames 24 in. (610 mm) o.c. fabricated from 25-gauge, 1 in. (25.4 mm) x 2 in. (50.8 mm) steel angles. Face layer 5/8 in. (15.9 mm) Fire-Shield Gypsum Board applied to frames with 1-3/4 in. (44.5 mm) Type S screws 8 in. (203 mm) o.c.</p>		

Fire / Sound Selector



Gypsum Board

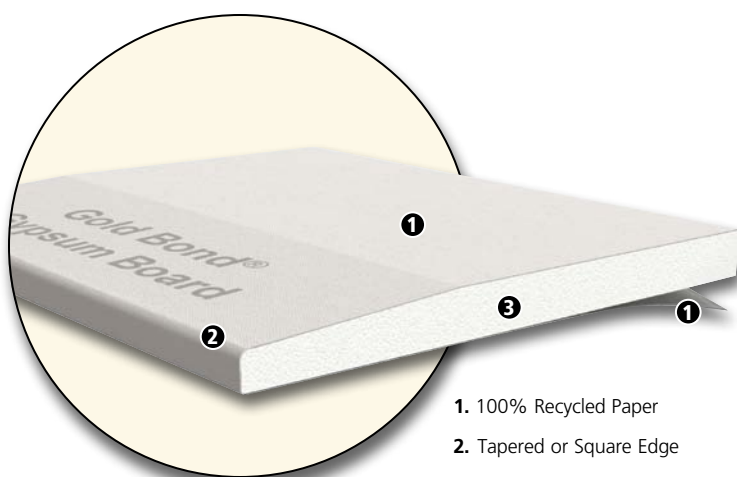
Gold Bond® BRAND Gypsum Board consists of a fire-resistant gypsum core encased in a heavy, natural finish with 100-percent recycled paper on the face and back sides. The face paper is folded around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth.

Use it for interior, non-fire-rated wall and ceiling applications.

For speed of installation, GridMarX® guide marks are printed on the paper surface.

Sizes: 1/4 in. (6.4 mm) and 3/8 in. (9.5 mm) thick Gypsum Boards are available in 4 ft. (1,219 mm) widths and standard lengths of 8 ft. (2,438 mm) to 12 ft. (3,658 mm). 1/2 in. (12.7 mm) thick Gypsum Boards are available in 4 ft. (1,219 mm) and 54 in. (1,372 mm) widths and standard lengths of 8 ft. (2,438 mm) to 16 ft. (4,877 mm).

Finishing: Long edges are tapered or square. Tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set™ Setting Compounds.



1. 100% Recycled Paper
2. Tapered or Square Edge
3. Gypsum Core

**Gold
Bond**
BRAND
Gypsum Board

National
Gypsum®

Basic Uses

APPLICATIONS

- **1/2 in. (12.7 mm)** – For use on interior walls and ceilings in non-fire-rated applications.
- **3/8 in. (9.5 mm)** – Lightweight for interior use in wall systems and for repair and remodel applications.
- **1/4 in. (6.4 mm)** – Lightweight, low-cost utility gypsum board for interior use over existing wall and ceiling surfaces. Also applicable for forming curved surfaces with short radii.

ADVANTAGES

- Lightweight and cost-efficient material that is compatible with a wide range of decorative finishes.
- Cuts easily for quick installation, permitting painting or other decoration and the installation of metal or wood trim almost immediately.
- Fire-resistant material with a gypsum core that will not support combustion or transmit temperatures greatly in excess of 212°F (100°C) until completely calcined, a slow process.
- Dimensionally stable under changes in temperature and relative humidity and resists warping, rippling, buckling and sagging.
- Features the GridMarX® preprinted fastening guide on the board to allow for faster and more accurate installation.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Installation Recommendations

GENERAL

- Install gypsum board in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.
- GridMarX provides quick identification and uniform nail/screw patterns. Use GridMarX to make accurate cuts without drawing lines. GridMarX guide marks run the length of the board at five points in 4 in. (102 mm) increments. Marks run along the edge in both tapers and at 16 in. (406 mm), 24 in. (610 mm) and 32 in. (813 mm) in the field of the board. The marks cover easily with no bleed-through using standard paint products.
- Apply gypsum board first to ceilings at right angles to framing members, then to walls. Use boards of maximum practical length so that the minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.
- Install batt or blanket ceiling insulation BEFORE the gypsum board on ceilings when installing a vapor retarder behind the gypsum board. Install the insulation IMMEDIATELY after the gypsum board when using loose fill insulation. Avoid installation practices that might allow condensation to form behind boards.
- Cut gypsum board to allow for a minimum 1/4 in. (6.4 mm) gap between gypsum board and floor to prevent potential wicking.
- Locate gypsum board joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.

TECHNICAL DATA

PHYSICAL PROPERTIES			
	1/4" Gold Bond Gypsum Board	3/8" Gold Bond Gypsum Board	1/2" Gold Bond Gypsum Board
Thickness¹, Nominal	1/4" (6.4 mm)	3/8" (9.5 mm)	1/2" (12.7 mm)
Width¹, Nominal	4' (1,219 mm)	4' (1,219 mm)	4' (1,219 mm), 54" (1,372 mm)
Length^{1,4}, Standard	8' – 12' (2,438 – 3,658 mm)	8' – 12' (2,438 – 3,658 mm)	8' – 16' (2,438 – 4,877 mm)
Weight, Nominal	1.1 lbs. / sq. ft. (5.37 k/m ²)	1.3 lbs. / sq. ft. (6.35 k/m ²)	1.6 lbs. / sq. ft. (7.81 k/m ²)
Edges¹	Square or Tapered	Square or Tapered	Square or Tapered
Flexural Strength¹, Perpendicular	≥ 46 lbf. (205 N)	≥ 77 lbf. (343 N)	≥ 107 lbf. (476 N)
Flexural Strength¹, Parallel	≥ 16 lbf. (71 N)	≥ 26 lbf. (116 N)	≥ 36 lbf. (160 N)
Humidified Deflection¹	N/A	≤ 15/8" (47.6 mm)	≤ 10/8" (31.8 mm)
Nail Pull Resistance¹	≥ 36 lbf. (160 N)	≥ 56 lbf. (249 N)	≥ 77 lbf. (343 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)
Bending Radius	5' (1,524 mm)	7'6" (2,286 mm)	10' (3,048 mm)
Thermal Resistance⁵	N/A	R = .33	R = .45
Product Standard Compliance	ASTM C1396	ASTM C1396	ASTM C1396
Fire-Resistance Characteristics			
Core Type	Regular	Regular	Regular
UL Type Designation	N/A	N/A	N/A
Combustibility²	Non-combustible Core	Non-combustible Core	Non-combustible Core
Surface Burning Characteristics³	Class A	Class A	Class A
Flame Spread³	15	15	15
Smoke Development³	0	0	0
Applicable Standards and References			
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products			
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus			
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board			
ASTM C1396 Standard Specification for Gypsum Board			
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials			
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C			
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>			
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>			
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>			
National Gypsum Company, <i>NGC Construction Guide</i>			

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

- Hold gypsum board in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the face paper of the gypsum board. Remove improperly driven nails or screws.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the gypsum board and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.
- Double nailing is an alternate method of attachment devised to minimize nail pops. This system requires doubling up on the field nails. The total quantity of nails used does not double, however, since maximum nail spacing is increased to 12 in. (305 mm) o.c. and conventional nailing is used on the perimeter. Application is accomplished by first single nailing the field of the board, starting at the center and working toward ends and edges. Another nail is then driven in close proximity (2 in. [50.8 mm] to 2-1/2 in. [63.6 mm]) to each of the first nails. The first series of nails are then struck again to ensure the board is drawn tightly to the framing member.
- When using adhesive to attach gypsum board, apply drywall adhesive to the face of studs or joists in continuous beads. Reference ASTM C840 Section 10.

CURVED SURFACES

To apply gypsum board over a curved surface, place a stop at one end of the board and then gently and gradually push on the other end, forcing the center against the framing until the curve is complete. Shorter radii than shown in the accompanying table may be obtained by moistening the face and back papers of the board with water and allowing the water to soak into the core. When the board is dry, it will regain its original hardness.

Apply gypsum board to curved surfaces in accordance with the following:

GYPSUM BOARD BENDING RADII		
Gypsum Panel	Bending Lengthwise	Bending Widthwise
1/4" (6.4 mm)	5'0" (1,524 mm)	15'0" (4,572 mm)
3/8" (9.5 mm)	7'6" (2,286 mm)	25'0" (7,620 mm)
1/2" (12.7 mm)	10'0" (3,048 mm)	—

To achieve tighter bending radii, use Gold Bond® BRAND 1/4 in. High Flex® Gypsum Board.

FINISHING

Refer to GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*, to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

DECORATION

Ensure gypsum board surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

CRITICAL LIGHTING AREAS

Wall and ceiling areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal minor surface imperfections. Light striking

the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paints and dark-toned paint finishes highlight surface defects; consider the use of textures to hide these minor visual imperfections.

Limitations

- Avoid exposure to excessive or continuous moisture and extreme temperatures. Do not expose gypsum board to temperatures exceeding 125°F (52°C) for extended periods of time.
- Properly ventilate or condition attic spaces to remove moisture buildup above gypsum board ceilings. If required, a vapor retarder may be installed in exterior ceilings behind gypsum board.
- Avoid installing gypsum board directly over insulation blankets with facer flanges placed continuously across the face of the framing members; recess insulation blankets and attach flanges to the sides of framing.
- Isolate gypsum board from contact with building structure in locations where structural movement may impose direct loads on gypsum board assemblies.
- Provide control joints spaced not more than 30 ft. (9,144 mm) where employing long continuous runs of walls, partitions or ceilings without perimeter relief.
- Avoid gypsum board joints within 12 in. (305 mm) of the corners of window or door frames unless installing control joints at these locations.
- Apply 1/4 in. (6.4 mm) gypsum board only to existing surfaces and do not apply directly to framing members, except when used with other thicknesses in double-layer systems tested for specific purposes. Existing walls and ceilings should be sound, flat, level and without void spaces. Apply 1/4 in. (6.4 mm) thick gypsum board with a combination of nails or screws and adhesive that will bond to the substrate surface covering. Framing spacing should not exceed 24 in. (610 mm) o.c. Apply adhesive to the substrate between framing members to bond the gypsum board.
- All ends and edges of gypsum board should occur over framing members or other solid backing except where treated joints occur at right angles to framing or furring members.
- Apply 1/2 in. (12.7 mm) gypsum board ceilings to be decorated with water-based spray texture perpendicular to the framing, spaced a maximum of 16 in. (406 mm) o.c.
- Space supporting framing for single-layer application of 1/2 in. (12.7 mm) gypsum board a maximum of 24 in. (610 mm) o.c. Space framing for single-layer application of 3/8 in. (9.5 mm) gypsum board a maximum of 16 in. (406 mm) o.c.
- To prevent objectionable sag in gypsum board ceilings, the weight of overlaid unsupported insulation should not exceed the following recommendations:

CEILING-SUPPORTED INSULATION				
	Regular	Regular	Regular	High Strength Ceiling Board
Thickness, Nominal	3/8" (9.5 mm)	1/2" (12.7 mm)	1/2" (12.7 mm)	1/2" (12.7 mm)
Framing Spacing	16" (406 mm) o.c.	16" (406 mm) o.c.	24" (610 mm) o.c.	24" (610 mm) o.c.
Weight of Ceiling – Supported Insulation	None Allowed	2.2 psf (10.7 kg/m ²)	1.6 psf (7.8 kg/m ²)	2.2 psf (10.7 kg/m ²)

Gold Bond® BRAND Gypsum Board

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.

High Strength LITE®

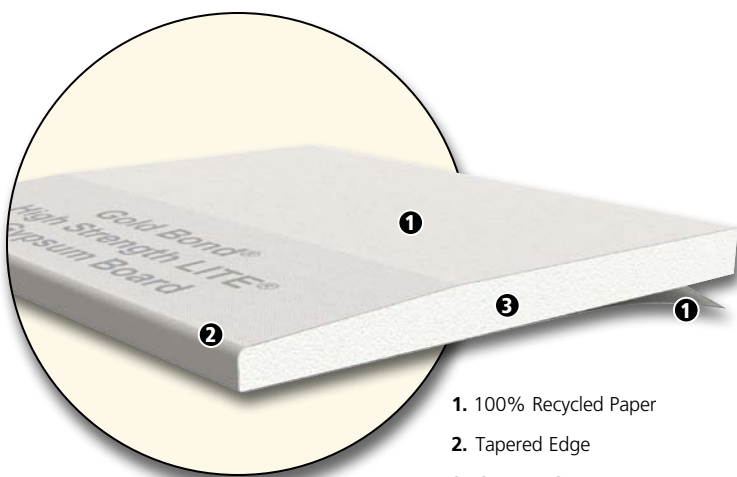
Gypsum Board

Gold Bond® BRAND High Strength LITE® Gypsum Board consists of a fire-resistant gypsum core with a heavy, natural finish and 100-percent recycled paper on the face and back sides. It is formulated to be 25 percent lighter in weight than Gold Bond® BRAND 1/2 in. (12.7 mm) Gypsum Board. The result is a superior board that is both sag resistant and easier to handle. The face paper is folded around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth. Use it for interior, non-fire-rated wall and ceiling applications.

For speed of installation, GridMarX® guide marks are printed on the paper surface.

Sizes: 1/2 in. (12.7 mm) thick boards are available in 4 ft. (1,219 mm) widths and in standard lengths of 8 ft. (2,438 mm) to 14 ft. (4,267 mm). 1/2 in. (12.7 mm) thick boards are also available in 54 in. (1,372 mm) widths and in standard lengths of 12 ft. (3,658 mm) and 14 ft. (4,267 mm).

Finishing: Long edges are tapered. Tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set™ Setting Compounds.



1. 100% Recycled Paper
2. Tapered Edge
3. Gypsum Core

**Gold
Bond**
BRAND
Gypsum Board

National
Gypsum®

Basic Uses

APPLICATIONS

Use High Strength LITE® for walls and ceilings in non-fire-rated construction where framing members are spaced up to 24 in. (610 mm) o.c.

ADVANTAGES

- 25 percent lighter than 1/2 in. (12.7 mm) Gold Bond® BRAND Gypsum Board, which results in easier handling.
- Excellent working properties, including improved score and snap, reduced dust and improved strength-to-weight ratio.
- Excellent sag resistance. Test results show overall sag resistance on tested assembly to be equivalent to 5/8 in. (15.9 mm) Type X Gypsum Board.
- Fire-resistant material with a gypsum core that will not support combustion or transmit temperatures greatly in excess of 212°F (100°C) until completely calcined, a slow process.
- Dimensionally stable under changes in temperature and relative humidity and resists warping, rippling, buckling and sagging.
- Features the GridMarX® preprinted fastening guide on the board to allow for faster and more accurate installation.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Installation Recommendations

GENERAL

- Install gypsum board in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.
- GridMarX provides quick identification and uniform nail/screw patterns. Use GridMarX to make accurate cuts without drawing lines. GridMarX guide marks run the length of the board at five points in 4 in. (102 mm) increments. Marks run along the edge in both tapers and at 16 in. (406 mm), 24 in. (610 mm) and 32 in. (813 mm) in the field of the board. The marks cover easily with no bleed-through using standard paint products.
- Apply gypsum board first to ceilings at right angles to framing members, then to walls. Use boards of maximum practical length so that the minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.
- Install batt or blanket ceiling insulation BEFORE the gypsum board on ceilings when installing a vapor retarder behind the gypsum board. Install the insulation IMMEDIATELY after the gypsum board when using loose fill insulation. Avoid installation practices that might allow condensation to form behind boards.
- Cut gypsum board to allow for a minimum 1/4 in. (6.4 mm) gap between gypsum board and floor to prevent potential wicking.
- Locate gypsum board joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Hold gypsum board in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the face paper of the gypsum board. Remove improperly driven nails or screws.

TECHNICAL DATA

PHYSICAL PROPERTIES	
	High Strength LITE Gypsum Board
Thickness¹, Nominal	1/2" (12.7 mm)
Width¹, Nominal	4' (1,219 mm) 54" (1,372 mm)
Length^{1,4}, Standard	8' – 14' (2,438 – 4,267 mm) 12' – 14' (3,657 – 4,267 mm)
Weight, Nominal	1.3 – 1.4 lbs. / sq. ft. (6.35 – 6.84 k/m ²)
Edges¹	Tapered
Flexural Strength¹, Perpendicular	≥ 107 lbf. (476 N)
Flexural Strength¹, Parallel	≥ 36 lbf. (160 N)
Humidified Deflection¹	≤ 10/8" (31.8 mm)
Nail Pull Resistance¹	≥ 77 lbf. (343 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)
Bending Radius	10' (3,048 mm)
Thermal Resistance⁵	R = .45
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	Regular
UL Type Designation	N/A
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	15
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>	
Gypsum Association GA-216, <i>Application and Finishing of Gypsum Panel Products</i>	
Gypsum Association GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

High Strength LITE® Gypsum Board

- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the gypsum board and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.

CURVED SURFACES

To apply gypsum board over a curved surface, place a stop at one end of the board and then gently and gradually push on the other end, forcing the center against the framing until the curve is complete. Shorter radii than shown in the accompanying table may be obtained by moistening the face and back papers of the board with water and allowing the water to soak into the core. When the board is dry, it will regain its original hardness.

Apply gypsum board to curved surfaces in accordance with the following:

GYPSUM BOARD BENDING RADII

Gypsum Panel	Bending Lengthwise	Bending Widthwise
1/2" (12.7 mm)	10'0" (3,048 mm)	—

To achieve tighter bending radii, use Gold Bond® BRAND 1/4 in. High Flex® Gypsum Board.

FINISHING

Refer to GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*, to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

DECORATION

Ensure gypsum board surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

CRITICAL LIGHTING AREAS

Wall and ceiling areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal even minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paints and dark-toned paint finishes highlight surface defects; consider the use of textures to hide these minor visual imperfections.

Limitations

- Avoid exposure to excessive or continuous moisture and extreme temperatures. Do not expose gypsum board to temperatures exceeding 125°F (52°C) for extended periods of time.
 - Properly ventilate or condition attic spaces to remove moisture buildup above gypsum board ceilings. If required, install a vapor retarder in exterior ceilings behind gypsum board.
 - Avoid installing gypsum board directly over insulation blankets with facer flanges placed continuously across the face of the framing members; recess insulation blankets and attach flanges to the sides of framing.
 - Isolate gypsum board from contact with building structure in locations where structural movement may impose direct loads on gypsum board assemblies.
 - Space control joints no more than 30 ft. (9,144 mm) where employing long continuous runs of walls, partitions or ceilings without perimeter relief.
 - Avoid gypsum board joints within 12 in. (305 mm) of the corners of window or door frames unless installing control joints at these locations.
- All ends and edges of gypsum board should occur over framing members or other solid backing except where treated joints occur at right angles to framing or furring members.
 - Apply 1/2 in. (12.7 mm) Gold Bond® BRAND High Strength LITE® to ceilings to be decorated with water-based spray texture perpendicular to framing, spaced a maximum of 24 in. (610 mm) o.c.
 - To prevent objectionable sag in gypsum paneled ceilings, the weight of overlaid unsupported insulation should not exceed the following recommendations:

CEILING-SUPPORTED INSULATION

Thickness, Nominal	1/2" (12.7 mm)
Framing Spacing	24" (610 mm) o.c.
Weight of Ceiling-Supported Insulation	2.2 psf (10.7 kg/m ²)

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.

High Strength Ceiling Board

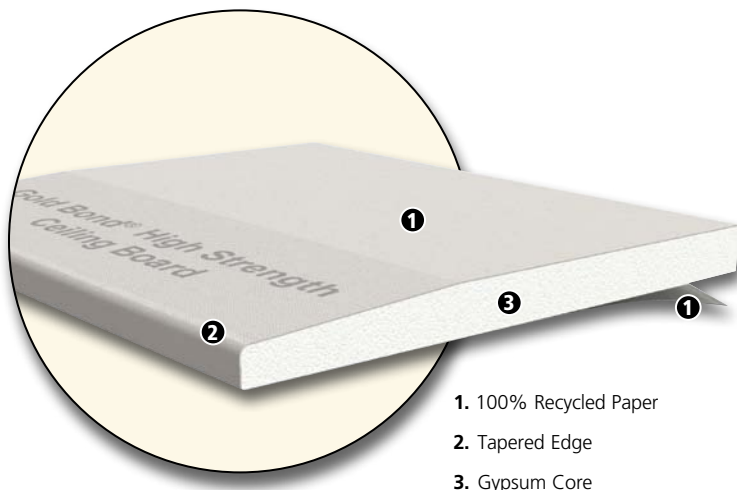
Gold Bond® BRAND High Strength Ceiling Board is a specialty gypsum board encased in 100-percent recycled paper. The increased uniformity and integrity of its gypsum core makes the sag resistance equivalent to 5/8 in. (15.9 mm) Type X Gypsum Board.

Use it for interior, non-fire-rated wall and ceiling applications.

For speed of installation, GridMarX® guide marks are printed on the paper surface.

Sizes: 1/2 in. (12.7 mm) thick ceiling boards are available in 4 ft. (1,219 mm) widths and in standard lengths of 12 ft. (3,658 mm).

Finishing: Long edges are tapered. Tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds, or ProForm® BRAND Quick Set™ Setting Compounds.



1. 100% Recycled Paper
2. Tapered Edge
3. Gypsum Core

**Gold
Bond**[®]
BRAND
Gypsum Board

National 
Gypsum[®]

Basic Uses

APPLICATIONS

Use High Strength Ceiling Board for ceilings in non-fire-rated construction where framing members are spaced up to 24 in. (610 mm) o.c.

ADVANTAGES

- Excellent sag resistance. In independent tests, High Strength Ceiling Board exhibited an average sag of only .033 in. (.84 mm) (approx. 1/32 in.) on joists spaced to 24 in. (610 mm) o.c. with a spray texture applied.
- Exhibits sag-resistant properties equal to 5/8 in. Type X Gypsum Board when tested in accordance with ASTM C473.
- Eliminates the need for two gypsum board thicknesses on the job. Reduces the scrap from the ceiling since you can also use the material on walls.
- Install on ceilings 24 in. (610 mm) o.c. using a water-based textured finish; supports overlaid insulation.
- Lighter weight board is easy to handle.
- Excellent working properties, including improved score and snap properties, which reduce the need for rasping.
- Improved strength-to-weight ratio and greater nail-holding power.
- The gypsum core will not support combustion or transmit temperatures greatly in excess of 212°F (100°C) until completely calcined, a slow process.
- Features the GridMarX® preprinted fastening guide on the board to allow for faster and more accurate installation.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Installation Recommendations

GENERAL

- Install gypsum board in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.
- GridMarX provides quick identification and uniform nail/screw patterns. Use GridMarX to make accurate cuts without drawing lines. GridMarX guide marks run the length of the board at five points in 4 in. (102 mm) increments. Marks run along the edge in both tapers and at 16 in. (406 mm), 24 in. (610 mm) and 32 in. (813 mm) in the field of the board. The marks cover easily with no bleed-through using standard paint products.
- Apply gypsum board first to ceilings at right angles to framing members, then to walls. Use boards of maximum practical length so that a minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.
- Install batt or blanket ceiling insulation BEFORE the gypsum board when installing a polyethylene vapor barrier on ceilings behind the gypsum board. Install the insulation IMMEDIATELY after the gypsum board when using loose fill insulation. Avoid installation practices that might allow condensation to form behind boards.
- Locate gypsum board joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Hold gypsum board in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the face paper of the gypsum board. Remove improperly driven nails or screws.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.

TECHNICAL DATA

PHYSICAL PROPERTIES	
	High Strength Ceiling Board
Thickness¹, Nominal	1/2" (12.7 mm)
Width¹, Nominal	4' (1,219 mm)
Length¹, Standard	12' (3,658 mm)
Weight, Nominal	1.8 lbs. / sq. ft. (8.79 k/m ²)
Edges¹	Tapered
Flexural Strength¹, Perpendicular	≥ 107 lbf. (476 N)
Flexural Strength¹, Parallel	≥ 36 lbf. (160 N)
Humidified Deflection¹	≤ 10/8" (31.8 mm)
Nail Pull Resistance¹	≥ 77 lbf. (343 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)
Bending Radius	10' (3,048 mm)
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	Regular
UL Type Designation	N/A
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	15
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>	
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>	
Gypsum Association, GA-238 <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

High Strength Ceiling Board

- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the gypsum board and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.

FINISHING

Refer to GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*, to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

DECORATION

Ensure gypsum board surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finished characteristics is the responsibility of the architect or contractor.

Prepare and prime gypsum board prior to decoration. Prime with sealer-type latex primer and allow to dry thoroughly.

CRITICAL LIGHTING AREAS

Ceiling areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paint, and dark-toned paint finishes highlight surface defects; consider the use of textures to hide these minor visual imperfections.

Limitations

- Not recommended for high moisture areas, such as baths, saunas, steam rooms, gang showers and indoor swimming pools.
- Avoid exposure to extreme temperatures. Do not expose gypsum board to temperatures exceeding 125°F (52°C) for extended periods of time.
- Properly ventilate or condition attic spaces to remove moisture buildup above gypsum board ceilings. If required, install a vapor retarder in exterior ceilings behind gypsum board.
- Do not allow weight of insulation to exceed 2.2 psf (10.7 kg/m²) when installing ceiling insulation. Apply insulation and polyethylene vapor barrier (if used) before installation.
- To prevent objectionable sag in gypsum paneled ceilings, the weight of overlaid unsupported insulation should not exceed the following recommendations:

CEILING-SUPPORTED INSULATION

Thickness, Nominal	1/2" (12.7 mm)
Framing Spacing	24" (610 mm) o.c.
Weight of Ceiling-Supported Insulation	2.2 psf (10.7 kg/m ²)

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



ThermalFOIL®

Gypsum Board

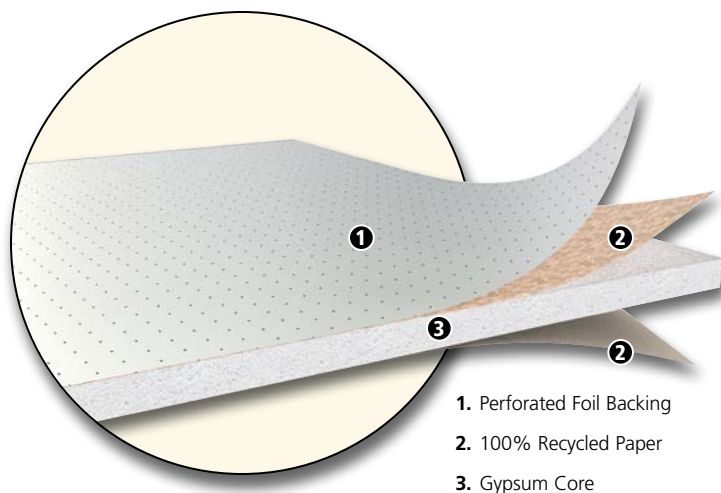
Gold Bond® BRAND ThermalFOIL® Gypsum Board consists of a fire-resistant gypsum core encased in a heavy, natural finish with 100-percent recycled paper on the face side and a perforated foil backing. When combined with closed-cell spray polyurethane foam insulation and a defined air space, it acts as part of a reflective insulated air space, complying with 2012 and 2015 International Energy Conservation Codes.

Use it in the interior face of exterior 2x4 (38.1 mm x 88.9 mm) wood stud walls in non-fire-rated construction with framing members spaced 16 in. (406 mm) o.c. The all-in-one technology eliminates flash and batt insulation systems, helping to save money on labor costs and to improve project cycle times.

GridMarX® guide marks are printed on the paper surface.

Sizes: 1/2 in. (12.7 mm) thick boards are available in 4 ft. (1,219 mm) widths and 8 ft. (2,438 mm) and 12 ft. (3,658 mm) standard lengths.

Finishing: Long edges are tapered. Tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set™ Setting Compounds.



Gold Bond®
BRAND
Gypsum Board

National
Gypsum®

Basic Uses

APPLICATIONS

Use 1/2 in. (12.7 mm) Gold Bond® BRAND ThermalFOIL® Gypsum Board for the interior face of exterior 2x4 (38.1 mm x 88.9 mm) wood stud walls in non-fire-rated construction where framing members are spaced 16 in. (406 mm) o.c.

ADVANTAGES

- Enables compliance with 2012 and 2015 International Energy Conservation Codes with 2x4 (38.1 mm x 88.9 mm) wood construction in most climate zones.
- Installs like regular gypsum board while offering a defined R-value system.
- Saves time and labor versus the two-step "flash and batt" methods.
- Saves cost over completely filling the cavity with closed-cell spray foam.
- Enables pulling of wire or pipes through the cavity after wall is completed.
- Excellent working properties, including score and snap, reduced dust and improved strength-to-weight ratio.
- Features the GridMarX® preprinted fastening guide on the board to allow for faster and more accurate installation.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Installation Recommendations

GENERAL

- Install gypsum board in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.
- GridMarX provides quick identification and uniform nail/screw patterns. Use GridMarX to make accurate cuts without drawing lines. GridMarX guide marks run the length of the board at five points in 4 in. (102 mm) increments. Marks run along the edge in both tapers and at 16 in. (406 mm), 24 in. (610 mm) and 32 in. (813 mm) in the field of the board. The marks cover easily with no bleed-through using standard paint products.
- Apply gypsum board first to ceilings at right angles to framing members, then to walls. Use boards of maximum practical length so that the minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.
- Install batt or blanket ceiling insulation BEFORE the gypsum board on ceilings when installing a vapor retarder behind the gypsum board. Install the insulation IMMEDIATELY after the gypsum board when using loose fill insulation. Avoid installation practices that might allow condensation to form behind boards.
- Cut gypsum board to allow for a minimum 1/4 in. (6.4 mm) gap between gypsum board and floor to prevent potential wicking.
- Locate gypsum board joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Hold gypsum board in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the face paper of the gypsum board. Remove improperly driven nails or screws.

TECHNICAL DATA

PHYSICAL PROPERTIES	
	ThermalFOIL Gypsum Board
Thickness¹, Nominal	1/2" (12.7 mm)
Width¹, Nominal	4' (1,219 mm)
Length¹, Standard	8' (2,438 mm), 12' (3,658 mm)
Weight, Nominal	1.3 – 1.4 lbs. / sq. ft. (6.35 – 6.84 k/m ²)
Edges¹	Tapered
Flexural Strength¹, Perpendicular	≥ 107 lbf. (476 N)
Flexural Strength¹, Parallel	≥ 36 lbf. (160 N)
Humidified Deflection¹	≤ 10/8" (31.8 mm)
Nail Pull Resistance¹	≥ 77 lbf. (343 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)
Bending Radius	10' (3,048 mm)
Thermal Resistance⁴	R = .45
Permeance⁵	> 5 perms
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	Regular
UL Type Designation	N/A
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	15
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>	
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>	
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Tested in accordance with ASTM C518.

5. Tested in accordance with ASTM E96.

Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

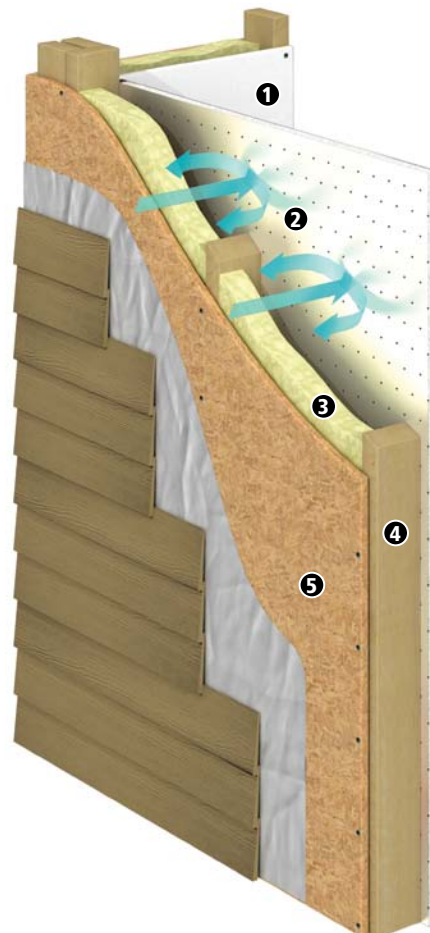
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the gypsum board and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.

ThermalFOIL® INSTALLATION

- Once you install exterior sheathing and weather resistant barrier, 2 lbs./cu. ft. (32 kg/m³) density closed-cell spray polyurethane foam is sprayed to the average depth needed to meet code when combined with the R-value of the ThermalFOIL plus air space.
- Refer to the spray polyurethane foam manufacturer's written installation instructions. Verify edges of the cavity are sealed by the spray polyurethane foam and that a consistent air space depth is maintained across all cavities.
- Following spray polyurethane foam installation, install ThermalFOIL in accordance with GA-216 and National Gypsum Company's *NGC Construction Guide*.
- To preserve the low-emittance performance of ThermalFOIL, repair damaged foil area using foil tape prior to installing gypsum board.
- To minimize airflow, seal penetrations, such as outlets and switches, using pads or caulk.
- ThermalFOIL is not intended to act as a vapor barrier. Do not use ThermalFOIL in areas other than the interior face of exterior wall assemblies.

ThermalFOIL® Installation

1. 1/2" ThermalFOIL®
2. Reflective Air Space
3. 2 lb. Closed Cell Spray Foam
4. 2x4 Studs, 16" o.c.
5. OSB or Plywood



FINISHING

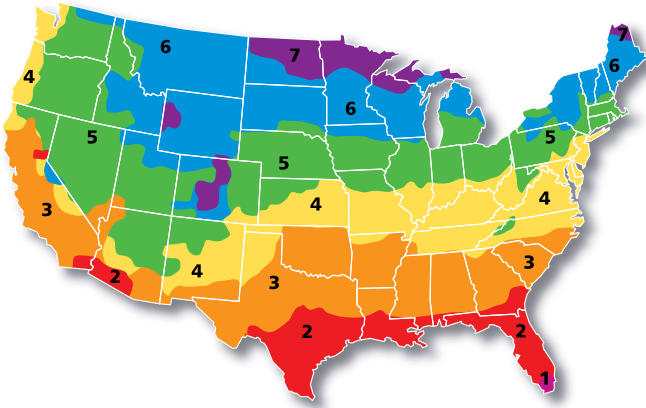
Refer to GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*, to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

DECORATION

Ensure gypsum board surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

Meet R-Value Needs With ThermalFOIL® Gypsum Board



RESIDENTIAL ENERGY CODE (R-VALUE MINIMUMS)			
Climate Zone	2009 IECC	2012 IECC	2015 IECC
1	R-13	R-13	R-13
2	R-13	R-13	R-13
3	R-13	R-20	R-20
4	R-13	R-20	R-20
5	R-20	R-20	R-20
6	R-20	R-20+5	R-20+5
7	R-21	R-20+5	R-20+5

ThermalFOIL GYPSUM BOARD R-VALUE TABLE*	
Air Space	R-Value (ThermalFOIL + Air Space)
0.75"	3.20
1.00"	3.70
1.10"	3.90

Based on 2x4 wood construction spaced 16" o.c. with 2.0 lbs. closed-cell spray polyurethane foam (SPUF).

Gold Bond®
Boards / Plaster

ThermalFOIL® SYSTEM TOTAL CAVITY R-VALUE												
R-Value/ In	2" Spray Foam + Air Space Total Value			2.25" Spray Foam + Air Space Total Value			2.5" Spray Foam + Air Space Total Value			2.75" Spray Foam + Air Space Total Value		
	2.0" SPUF	ThermalFOIL and 1.5" Air Space	Total Value	2.25" SPUF	ThermalFOIL and 1.25" Air Space	Total Value	2.5" SPUF	ThermalFOIL and 1" Air Space	Total Value	2.75" SPUF	ThermalFOIL and .75" Air Space	Total Value
6.0	12.0	3.9	15.9	13.5	4.0	17.5	15.0	3.7	18.7	16.5	3.2	19.7
6.1	12.2	3.9	16.1	13.7	4.0	17.7	15.3	3.7	19.0	16.8	3.2	20.0
6.2	12.4	3.9	16.3	14.0	4.0	18.0	15.5	3.7	19.2	17.1	3.2	20.3
6.3	12.6	3.9	16.5	14.2	4.0	18.2	15.8	3.7	19.5	17.3	3.2	20.5
6.4	12.8	3.9	16.7	14.4	4.0	18.4	16.0	3.7	19.7	17.6	3.2	20.8
6.5	13.0	3.9	16.9	14.6	4.0	18.6	16.3	3.7	20.0	17.9	3.2	21.1
6.6	13.2	3.9	17.1	14.9	4.0	18.9	16.5	3.7	20.2	18.2	3.2	21.4
6.7	13.4	3.9	17.3	15.1	4.0	19.1	16.8	3.7	20.5	18.4	3.2	21.6
6.8	13.6	3.9	17.5	15.3	4.0	19.3	17.0	3.7	20.7	18.7	3.2	21.9
6.9	13.8	3.9	17.7	15.5	4.0	19.5	17.3	3.7	21.0	19.0	3.2	22.2
7.0	14.0	3.9	17.9	15.8	4.0	19.8	17.5	3.7	21.2	19.3	3.2	22.5
7.1	14.2	3.9	18.1	16.0	4.0	20.0	17.8	3.7	21.5	19.5	3.2	22.7
7.2	14.4	3.9	18.3	16.2	4.0	20.2	18.0	3.7	21.7	19.8	3.2	23.0
7.3	14.6	3.9	18.5	16.4	4.0	20.4	18.3	3.7	22.0	20.1	3.2	23.3
7.4	14.8	3.9	18.7	16.7	4.0	20.7	18.5	3.7	22.2	20.4	3.2	23.6
7.5	15.0	3.9	18.9	16.9	4.0	20.9	18.8	3.7	22.5	20.6	3.2	23.8

Dark gray represents the combination of the spray foam and the air space that would meet the 2012 and 2015 Energy Code for R-20 Cavity Insulation (dependent on the R-value/in. for the spray foam brand).
 Yellow represents the combination of the spray foam and the air space that would meet the 2009 Energy Code for R-17 Cavity Insulation (dependent on the R-value/in. for the spray foam brand).

CRITICAL LIGHTING AREAS

Wall areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal even minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paints and dark-toned paint finishes highlight surface defects; consider the use of textures to hide these minor visual imperfections.

Safety

Foil is an electrical conductor. If it comes in contact with exposed wiring it can lead to shock. All electrical wiring and wired connections should always be installed by a professional electrician. They must conform to all applicable building codes, including containment within appropriate electrical boxes to avoid contact with the foil surface. All electrical trim-out that occurs after ThermalFOIL® is installed should avoid contact with the foil-backed surface of the gypsum board.

Corrugated Stainless Steel Tubing (CSST) gas lines are not recommended to be used or installed with, through or adjacent to ThermalFOIL Gypsum Board. Use of CSST in or near contact with foil or other metal surfaces can cause arcing in the event of a lightning strike with the potential for gas leaks and fire hazards. Use only black pipe gas line systems to penetrate a wall utilizing ThermalFOIL Gypsum Board.

Limitations

- Not recommended for high moisture areas, such as saunas, steam rooms or gang showers.
- Prime with latex primer and allow to dry thoroughly before decoration.
- Do not use as a vapor barrier.
- Minimum defined air space must be an average of 3/4 in. (19.1 mm) in depth.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



Fire-Shield®

Gypsum Board

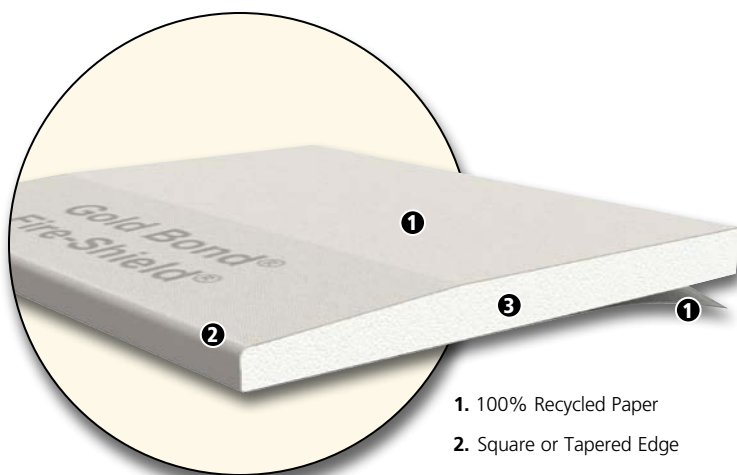
Gold Bond® BRAND Fire-Shield® Gypsum Board consists of a fire-resistant gypsum core with a heavy, natural finish and 100-percent recycled paper on the face and back sides. The face paper folds around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth.

Use it for interior, fire-rated wall and ceiling applications. A specially formulated Type C core is also available where required.

For speed of installation, GridMarX® guide marks are printed on the paper surface.

Sizes: 1/2 in. (12.7 mm) thick Type C Boards are available in 4 ft. (1,219 mm) widths and in standard lengths of 6 ft. (1,829 mm) to 16 ft. (4,877 mm). 5/8 in. (15.9 mm) thick Type X and Type C Boards are available in 4 ft. (1,219 mm) and 54 in. (1,372 mm) widths and standard lengths of 6 ft. (1,829 mm) to 16 ft. (4,877 mm).

Finishing: Long edges of the boards are tapered or square. Tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set™ Setting Compounds.



1. 100% Recycled Paper
2. Square or Tapered Edge
3. Gypsum Core

**Gold
Bond**
BRAND
Gypsum Board

National
Gypsum®

Basic Uses

APPLICATIONS

Use 1/2 in. (12.7 mm) Type C and 5/8 in. (15.9 mm) Fire-Shield® Gypsum Boards on walls and ceilings in fire-rated construction where the framing members are spaced up to 24 in. (610 mm) o.c.

ADVANTAGES

- Approved component in specific UL-rated designs.
- Lightweight and cost-efficient material that is compatible with a wide range of decorative finishes.
- Cuts easily for quick installation, permitting painting or other decoration and the installation of metal or wood trim almost immediately.
- Fire-resistant material with a gypsum core that will not support combustion or transmit temperatures greatly in excess of 212°F (100°C) until completely calcined, a slow process.
- Dimensionally stable under changes in temperature and relative humidity and resists warping, rippling, buckling and sagging.
- Features the GridMarX® preprinted fastening guide on the board to allow for faster and more accurate installation.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Installation Recommendations

GENERAL

- Install gypsum board in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.
- GridMarX provides quick identification and uniform nail/screw patterns. Use GridMarX to make accurate cuts without drawing lines. GridMarX guide marks run the length of the board at five points in 4 in. (102 mm) increments. Marks run along the edge in both tapers and at 16 in. (406 mm), 24 in. (610 mm) and 32 in. (813 mm) in the field of the board. The marks cover easily with no bleed-through using standard paint products.
- Apply gypsum board first to ceilings at right angles to framing members, then to walls. Use boards of maximum practical length so that the minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.
- Install batt or blanket ceiling insulation BEFORE the gypsum board on ceilings when installing a vapor retarder behind the gypsum board. Install the insulation IMMEDIATELY after the gypsum board when using loose fill insulation. Avoid installation practices that might allow condensation to form behind boards.
- Cut gypsum board to allow for a minimum 1/4 in. (6.4 mm) gap between gypsum board and floor to prevent potential wicking.
- Locate gypsum board joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Hold gypsum board in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the face paper of the gypsum board. Remove improperly driven nails or screws.

TECHNICAL DATA

PHYSICAL PROPERTIES			
	1/2" Fire-Shield C Gypsum Board	5/8" Fire-Shield Gypsum Board	5/8" Fire-Shield C Gypsum Board
Thickness¹, Nominal	1/2" (12.7 mm)	5/8" (15.9 mm)	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm)	4' (1,219 mm), 54" (1,372 mm)	4' (1,219 mm), 54" (1,372 mm)
Length^{1,4}, Standard	6' – 16' (1,829 – 4,877 mm)	6' – 16' (1,829 – 4,877 mm)	6' – 16' (1,829 – 4,877 mm)
Weight, Nominal	1.9 lbs. / sq. ft. (9.28 k/m ²)	2.2 lbs. / sq. ft. (10.74 k/m ²)	2.3 lbs. / sq. ft. (11.23 k/m ²)
Edges¹	Square or Tapered	Square or Tapered	Square or Tapered
Flexural Strength¹, Perpendicular	≥ 107 lbf. (476 N)	≥ 147 lbf. (654 N)	≥ 147 lbf. (654 N)
Flexural Strength¹, Parallel	≥ 36 lbf. (160 N)	≥ 46 lbf. (205 N)	≥ 46 lbf. (205 N)
Humidified Deflection¹	≤ 10/8" (31.8 mm)	≤ 5/8" (15.9 mm)	≤ 5/8" (15.9 mm)
Nail Pull Resistance¹	≥ 77 lbf. (343 N)	≥ 87 lbf. (387 N)	≥ 87 lbf. (387 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)
Bending Radius	10' (3,048 mm)	15' (4,572 mm)	15' (4,572 mm)
Thermal Resistance⁵	R = .45	R = .56	R = .56
Product Standard Compliance	ASTM C1396	ASTM C1396	ASTM C1396
Fire-Resistance Characteristics			
Core Type	Type C	Type X	Type C
UL Type Designation	FSW-C	FSW	FSW-C
Combustibility²	Non-combustible Core	Non-combustible Core	Non-combustible Core
Surface Burning Characteristics³	Class A	Class A	Class A
Flame Spread³	15	15	15
Smoke Development³	0	0	0
Applicable Standards and References			
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products			
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus			
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board			
ASTM C1396 Standard Specification for Gypsum Board			
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials			
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C			
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>			
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>			
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>			
National Gypsum Company, <i>NGC Construction Guide</i>			

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the gypsum board and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.

FINISHING

Refer to GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*, to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

DECORATION

Ensure gypsum board surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

CRITICAL LIGHTING AREAS

Wall and ceiling areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paints and dark-toned paint finishes highlight surface defects; consider the use of textures to hide these minor visual imperfections.

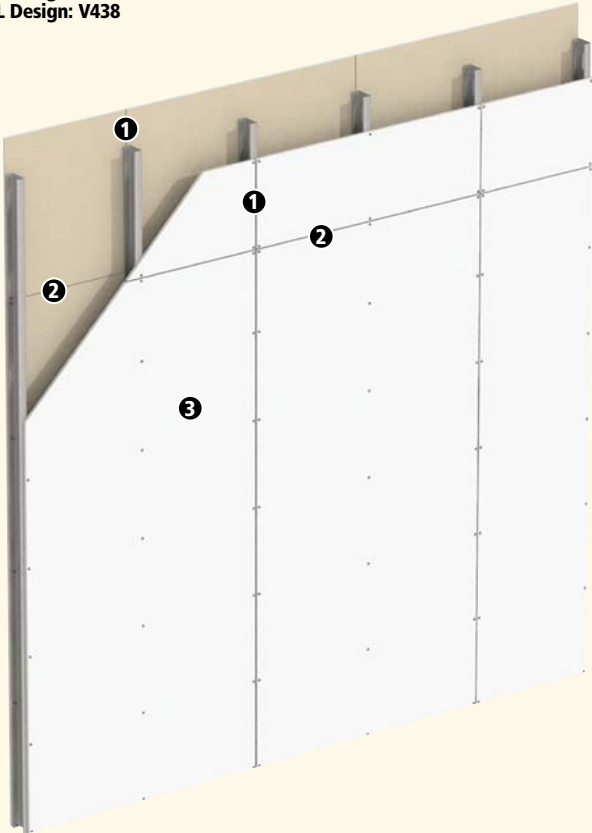
Limitations

- Avoid exposure to excessive or continuous moisture and extreme temperatures. Do not expose gypsum board to temperatures exceeding 125°F (52°C) for extended periods of time.
- Properly ventilate or condition attic spaces to remove moisture buildup above gypsum board ceilings. If required, install a vapor retarder in exterior ceilings behind gypsum board.
- Avoid installing gypsum board directly over insulation blankets with facer flanges placed continuously across the face of the framing members; recess insulation blankets and attach flanges to the sides of framing.
- Isolate gypsum board from contact with building structure in locations where structural movement may impose direct loads on gypsum board assemblies.
- Provide control joints spaced not more than 30 ft. (9,144 mm) where employing long continuous runs of walls, partitions or ceilings without perimeter relief.
- Avoid gypsum board joints within 12 in. (305 mm) of the corners of window or door frames unless installing control joints at these locations.
- Space supporting framing for single-layer application of 1/2 in. (12.7 mm) and 5/8 in. (15.9 mm) gypsum board a maximum of 24 in. (610 mm) o.c.
- To prevent objectionable sag in gypsum board ceilings, the weight of overlaid, unsupported insulation should not exceed the following recommendations:

CEILING-SUPPORTED INSULATION			
Type	Type X	Type C	Type C
Thickness, Nominal	5/8" (15.9 mm)	1/2" (12.7 mm)	5/8" (15.9 mm)
Framing Spacing	24" o.c. (610 mm)	24" o.c. (610 mm)	24" o.c. (610 mm)
Weight of Ceiling-Supported Insulation	2.2 psf (10.7 kg/m ²)	1.3 psf (6.3 kg/m ²)	2.2 psf (10.7 kg/m ²)

1-HR. PARTITION

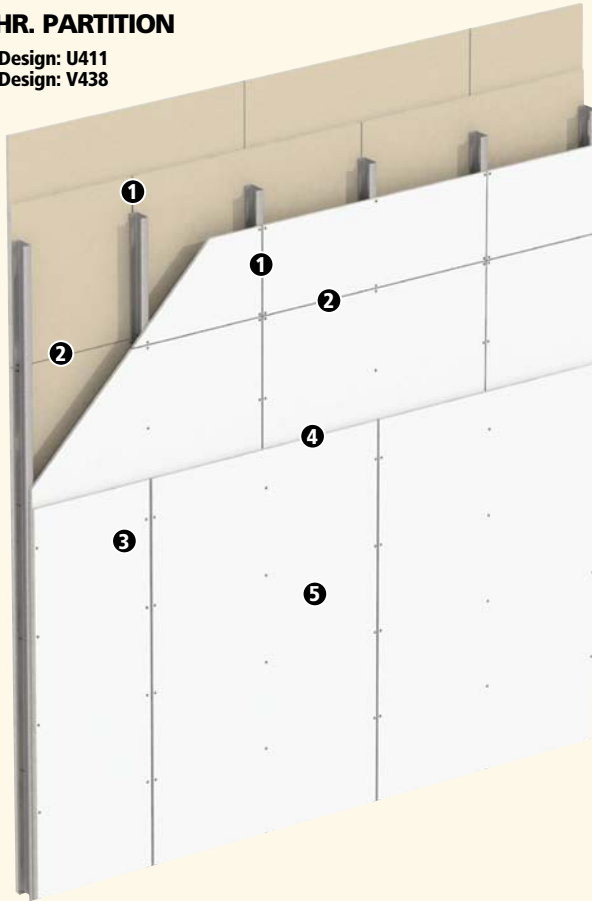
UL Design: U465
UL Design: V438



- 1. Stagger vertical joints over one-stud cavity on opposite sides of partition.
- 2. No need to stagger horizontal joints or back by framing.
- 3. 5/8" Fire-Shield® Gypsum Board.

2-HR. PARTITION

UL Design: U411
UL Design: V438



- 1. Stagger vertical joints over one-stud cavity on opposite sides of partition.
- 2. No need to stagger horizontal joints or to back by framing.
- 3. Stagger vertical joints over one-stud cavity between base and face layers.
- 4. Stagger horizontal joints 12" (305 mm) minimum between base and face layers.
- 5. Two layers 5/8" Fire-Shield® Gypsum Board.

Gold Bond®
Boards / Plaster

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.

High Strength Fire-Shield® LITE®

Gypsum Board

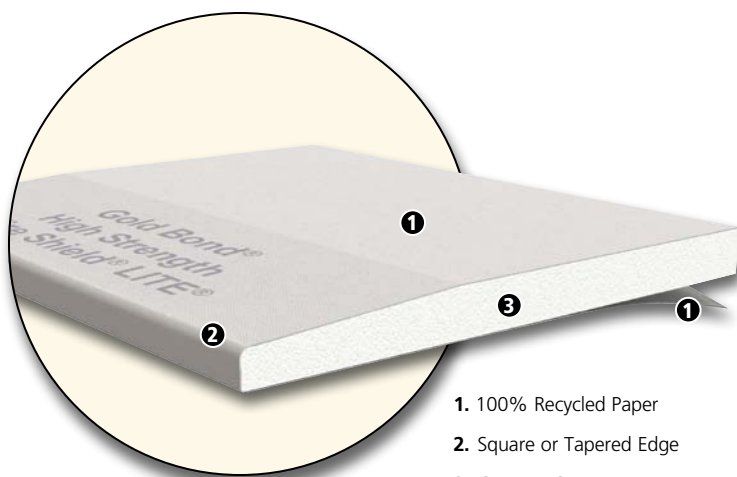
Gold Bond® BRAND High Strength Fire-Shield® LITE® Gypsum Board consists of a fire-resistant gypsum core with a heavy, natural finish and 100-percent recycled paper on the face and back sides. It is formulated to be 15 percent lighter than standard Type X Gypsum Board. The face paper is folded around the long edges to reinforce and protect the core.

Use it for interior, fire-rated wall and ceiling applications. High Strength Fire-Shield® LITE® features a Type X fire-resistive core for use in laboratory tested, fire-rated assemblies.

For speed of installation, GridMarX® guide marks are printed on the paper surface.

Sizes: 5/8 in. (15.9 mm) thick boards are available in 4 ft. (1,219 mm) and 54 in. (1,372 mm) widths and in standard lengths of 8 ft. (2,438 mm) to 12 ft. (3,658 mm).

Finishing: Long edges are tapered or square. Tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set™ Setting Compounds.



1. 100% Recycled Paper
2. Square or Tapered Edge
3. Gypsum Core

**Gold
Bond**
BRAND
Gypsum Board

National
Gypsum®

Basic Uses

APPLICATIONS

Use 5/8 in. (15.9 mm) High Strength Fire-Shield® LITE® Gypsum Board for walls and ceilings in fire-rated construction where the framing members are spaced up to 24 in. (610 mm) o.c.

ADVANTAGES

- Approved component in specific UL-rated designs.
- 15 percent lighter than standard 5/8 in. (15.9 mm) Type X Gypsum Board, which results in easier handling.
- Cuts easily for quick installation, permitting painting or other decoration and the installation of metal or wood trim almost immediately.
- Excellent working properties, including score and snap, reduced dust and improved strength-to-weight ratio.
- Fire-resistant material with a gypsum core that will not support combustion or transmit temperatures greatly in excess of 212°F (100°C) until completely calcined, a slow process.
- Dimensionally stable under changes in temperature and relative humidity and resists warping, rippling, buckling and sagging.
- Features the GridMarX® preprinted fastening guide on the board to allow for faster and more accurate installation.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Installation Recommendations

GENERAL

- Install gypsum board in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.
- GridMarX provides quick identification and uniform nail/screw patterns. Use GridMarX to make accurate cuts without drawing lines. GridMarX guide marks run the length of the board at five points in 4 in. (102 mm) increments. Marks run along the edge in both tapers and at 16 in. (406 mm), 24 in. (610 mm) and 32 in. (813 mm) in the field of the board. The marks cover easily with no bleed-through using standard paint products.
- Apply gypsum board first to ceilings at right angles to framing members, then to walls. Use boards of maximum practical length so that the minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.
- Install batt or blanket ceiling insulation BEFORE the gypsum board on ceilings when installing a vapor retarder behind the gypsum board. Install the insulation IMMEDIATELY after the gypsum board when using loose fill insulation. Avoid installation practices that might allow condensation to form behind boards.
- Cut gypsum board to allow for a minimum 1/4 in. (6.4 mm) gap between gypsum board and floor to prevent potential wicking.
- Locate gypsum board joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.

TECHNICAL DATA

PHYSICAL PROPERTIES	
	High Strength Fire-Shield LITE
Thickness¹, Nominal	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm), 54" (1,372 mm)
Length^{1,4}, Standard	8' – 12' (2,438 mm – 3,658 mm)
Weight, Nominal	1.9 lbs. / sq. ft. (9.28 k/m ²)
Edges¹	Square or Tapered
Flexural Strength¹, Perpendicular	≥ 147 lbf. (654 N)
Flexural Strength¹, Parallel	≥ 46 lbf. (205 N)
Humidified Deflection¹	≤ 5/8" (15.9 mm)
Nail Pull Resistance¹	≥ 87 lbf. (387 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)
Bending Radius	15' (4,572 mm)
Thermal Resistance⁵	R = .56
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	Type X
UL Type Designation	FSL
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	15
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>	
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>	
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

High Strength Fire-Shield® LITE® Gypsum Board

- Hold gypsum board in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the face paper of the gypsum board. Remove improperly driven nails or screws.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the gypsum board and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.

FINISHING

Refer to GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*, to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

DECORATION

Ensure gypsum board surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

CRITICAL LIGHTING AREAS

Wall and ceiling areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paints and dark-toned paint finishes highlight surface defects; consider the use of textures to hide these minor visual imperfections.

Limitations

- Avoid exposure to excessive or continuous moisture and extreme temperatures. Do not expose gypsum board to temperatures exceeding 125°F (52°C) for extended periods of time.
- Properly ventilate or condition attic spaces to remove moisture buildup above gypsum board ceilings. If required, install a vapor retarder in exterior ceilings behind gypsum board.
- Avoid installing gypsum board directly over insulation blankets with facer flanges placed continuously across the face of the framing members; recess insulation blankets and attach flanges to the sides of framing.
- Isolate gypsum board from contact with building structure in locations where structural movement may impose direct loads on gypsum board assemblies.
- Provide control joints spaced not more than 30 ft. (9,144 mm) where employing long continuous runs of walls, partitions or ceilings without perimeter relief.
- Avoid gypsum board joints within 12 in. (305 mm) of the corners of window or door frames unless installing control joints at these locations.
- Space supporting framing for single-layer application of 1/2 in. (12.7 mm) and 5/8 in. (15.9 mm) gypsum board a maximum of 24 in. (610 mm) o.c.
- To prevent objectionable sag in gypsum board ceilings, the weight of overlaid, unsupported insulation should not exceed the following recommendations:

CEILING-SUPPORTED INSULATION	
Type	Type X
Thickness, Nominal	5/8" (15.9 mm)
Framing Spacing	24" (610 mm) o.c.
Weight of Ceiling Supported Insulation	2.2 psf (10.7 kg/m ²)

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.

High Strength Fire-Shield® LITE® 30 Gypsum Board

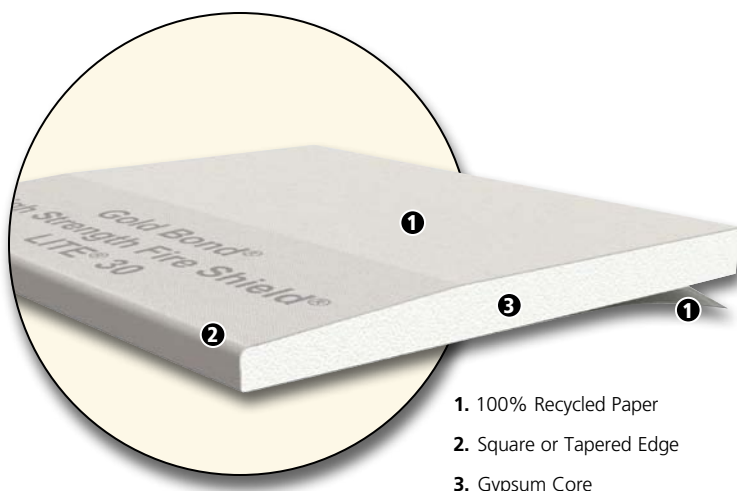
Gold Bond® BRAND High Strength Fire-Shield® LITE® 30 Gypsum Board consists of a fire-resistant, non-Type X gypsum core with a heavy, natural finish and 100-percent recycled paper on the face and back sides. It is specially formulated to be 30 percent lighter in weight than standard Type X Gypsum Board. The result is a superior board that is both sag resistant and easier to handle. The face paper is folded around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth.

Use it for interior, 30-minute fire-rated or non-rated wall and ceiling applications.

For speed of installation, GridMarX® guide marks are printed on the paper surface.

Sizes: 5/8" (15.9 mm) thick boards are available in 4 ft. (1,219 mm) and in standard lengths of 8 ft. (2,438 mm) to 12 ft. (3,658 mm).

Finishing: Long edges are tapered or square. Tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set™ Setting Compounds.



1. 100% Recycled Paper
2. Square or Tapered Edge
3. Gypsum Core

NOTE: This is a non-Type X product and is not a substitute for Type X Gypsum Board. The High Strength Fire-Shield LITE® 30 product is for single- or multi-layer gypsum board construction for 30-minute fire-rated and non-rated assemblies. The face of the board and the product end tapes are clearly labeled so the installer can identify this product for the appropriate application.

**Gold
Bond**
BRAND
Gypsum Board

National
Gypsum®

High Strength Fire-Shield® LITE® 30 Gypsum Board

Basic Uses

APPLICATIONS

Use High Strength Fire-Shield® LITE® 30 for single-layer construction in 30-minute fire-rated or non-rated assemblies.

ADVANTAGES

- 30 percent lighter than standard 5/8" (15.9 mm) Gold Bond® BRAND Fire-Shield® Gypsum Board, which results in easier handling.
- Features a fire-resistant non-Type X core and is UL Classified and approved for inclusion on specific UL fire-rated designs.
- Excellent working properties, including score and snap, reduced dust and improved strength-to-weight ratio.
- Fire-resistant material with a gypsum core will not support combustion or transmit temperatures greatly in excess of 212° F (100° C) until completely calcined, a slow process.
- Dimensionally stable under changes in temperature and relative humidity and resists warping, rippling, buckling and sagging.
- Features the GridMarX® preprinted fastening guide on the board to allow for faster and more accurate installation.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.
- GridMarX provides quick identification and uniform nail/screw patterns. Use GridMarX to make accurate cuts without drawing lines. GridMarX guide marks run the length of the board at five points in 4 in. (102 mm) increments. Marks run along the edge in both tapers and at 16 in. (406 mm), 24 in. (610 mm) and 32 in. (813 mm) in the field of the board. The marks cover easily with no bleed-through using standard paint products.
- Apply gypsum board first to ceilings at right angles to framing members, then to walls. Use boards of maximum practical length so that the minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.
- Locate gypsum board joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Hold gypsum board in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the face paper of the gypsum board. Remove improperly driven nails or screws.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the gypsum board and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.

Installation Recommendations

GENERAL

- Install gypsum board in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.

FINISHING

Refer to GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*, to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

TECHNICAL DATA

PHYSICAL PROPERTIES	
	High Strength Fire-Shield LITE 30
Thickness¹, Nominal	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm)
Length^{1,4}, Standard	8' – 12' (2,438 mm – 3,658 mm)
Weight, Nominal	1.6 – 1.8 lbs. / sq. ft. (7.81 – 8.79 k/m ²)
Edges¹	Square or Tapered
Flexural Strength¹, Perpendicular	≥ 147 lbf. (654 N)
Flexural Strength¹, Parallel	≥ 46 lbf. (205 N)
Humidified Deflection¹	≤ 5/8" (15.9 mm)
Nail Pull Resistance¹	≥ 87 lbf. (387 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)
Bending Radius	15' (4,572 mm)
Thermal Resistance⁵	R = .56
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	Non-Type X
UL Type Designation	FSL30
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	15
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>	
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>	
Gypsum Association, GA-238 <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

DECORATION

Ensure gypsum board surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

CRITICAL LIGHTING AREAS

Wall and ceiling areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal even minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paints and dark-toned paint finishes highlight surface defects; consider the use of textures to hide these minor visual imperfections.

Limitations

- Do not substitute High Strength Fire-Shield® LITE® 30 for Type X Gypsum Board as 5/8" High Strength Fire-Shield LITE® 30 is not classified as a Type X.
- Avoid exposure to excessive or continuous moisture and extreme temperatures. Do not expose gypsum board to temperatures exceeding 125°F (52°C) for extended periods of time.
- Properly ventilate or condition attic spaces to remove moisture buildup above gypsum board ceilings. If required, install a vapor retarder in exterior ceilings behind gypsum board.
- Avoid installing gypsum board directly over insulation blankets with facer flanges placed continuously across the face of the framing members; recess insulation blankets and attach flanges to the sides of framing.

- Isolate gypsum board from contact with building structure in locations where structural movement may impose direct loads on gypsum board assemblies.
- Provide control joints spaced not more than 30 ft. (9,144 mm) where employing long continuous runs of walls, partitions or ceilings without perimeter relief.
- Avoid gypsum board joints within 12 in. (305 mm) of the corners of window or door frames unless installing control joints at these locations.
- Space supporting framing for single-layer application of 5/8 in. (15.9 mm) gypsum board a maximum of 24 in. (610 mm) o.c.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



3/4" Ultra-Shield FS®

Gypsum Board

Gold Bond® BRAND 3/4" Ultra-Shield FS® Gypsum Board consists of a fire-resistant gypsum core with a heavy, natural finish and 100-percent recycled paper on the face and back sides. The face paper is folded around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth.

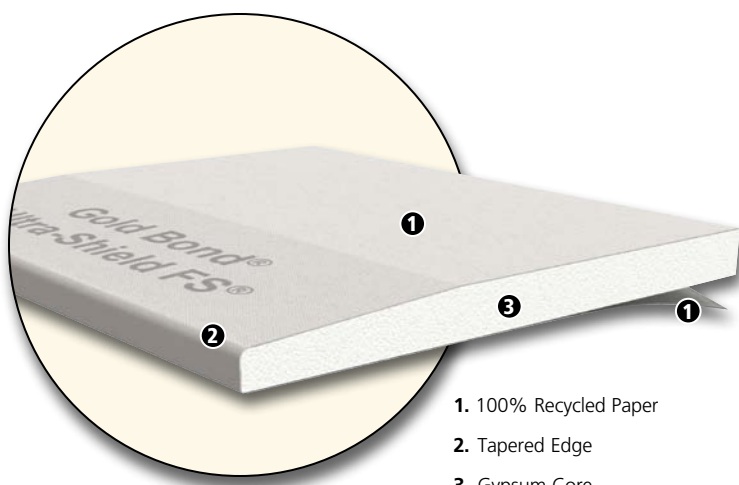
Use it for 2-hour wall partitions and shaftwall assemblies to reduce material and installation labor.

The UltraShield core allows one layer of 3/4" Ultra-Shield FS® to replace two layers of 5/8 in. Type X in specific UL assemblies. Gold Bond® BRAND 3/4" Ultra-Shield FS® XP® Gypsum Board with mold, mildew and moisture resistance is available by special order.

For speed of installation, GridMarX® guide marks are printed on the paper surface.

Sizes: 3/4 in. (19.1 mm) thick boards are available in 4 ft. (1,219 mm) widths and standard lengths of 8 ft. (2,438 mm) to 12 ft. (3,658 mm) lengths.

Finishing: Long edges are tapered. Tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set™ Setting Compounds.



1. 100% Recycled Paper
2. Tapered Edge
3. Gypsum Core

**Gold
Bond**
BRAND
Gypsum Board

National
Gypsum®

Basic Uses

APPLICATIONS

Use 3/4" Ultra-Shield FS® Gypsum Board to achieve increased resistance to fire and sound transmission reduction.

ADVANTAGES

- Reduces labor and material costs by using fewer layers (up to 10 percent).
- UL Classified for fire resistance, surface-burning characteristics and non-combustibility. Ultra-Shield FS® offers 2-hour assemblies for wall partitions and cavity shaftwall systems.
- Cost-efficient material that readily accepts a wide range of decorative finishes.
- Cuts easily for quick installation, permitting painting or other decoration and the installation of metal or wood trim almost immediately.
- The gypsum core will not support combustion or transmit temperatures greatly in excess of 212°F (100°C) until completely calcined, a slow process.
- Dimensionally stable under changes in temperature and relative humidity and resists warping, rippling, buckling and sagging.
- Features the GridMarX® preprinted fastening guide on the board to allow for faster and more accurate installation.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Installation Recommendations

GENERAL

- Install gypsum board in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.
- GridMarX provides quick identification and uniform nail/screw patterns. Use GridMarX to make accurate cuts without drawing lines. GridMarX guide marks run the length of the board at five points in 4 in. (102 mm) increments. Marks run along the edge in both tapers and at 16 in. (406 mm), 24 in. (610 mm) and 32 in. (813 mm) in the field of the board. The marks cover easily with no bleed-through using standard paint products.
- Apply gypsum board first to ceilings at right angles to framing members, then to walls. Use boards of maximum practical length so that the minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.
- Locate gypsum board joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Hold gypsum board in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the face paper of the gypsum board. Remove improperly driven nails or screws.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the gypsum board and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.

TECHNICAL DATA

PHYSICAL PROPERTIES	
	3/4" Ultra-Shield FS Gypsum Board
Thickness¹, Nominal	3/4" (19.1 mm)
Width¹, Nominal	4' (1,219 mm)
Length^{1,4}, Standard	8' – 12' (2,438 mm – 3,658 mm)
Weight, Nominal	2.85 lbs. / sq. ft. (13.91 k/m ²)
Edges¹	Tapered
Flexural Strength¹, Perpendicular	≥ 167 lbf. (743 N)
Flexural Strength¹, Parallel	≥ 56 lbf. (249 N)
Humidified Deflection¹	≤ 5/8" (15.9 mm)
Nail Pull Resistance¹	≥ 97 lbf. (432 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)
Bending Radius	N/A
Thermal Resistance⁵	R = .64
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	UltraShield
UL Type Designation	UltraShield
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	15
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>	
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>	
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

FINISHING

Refer to GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*, to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

DECORATION

Ensure gypsum board surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

Prepare and prime gypsum board prior to decoration.

CRITICAL LIGHTING AREAS

Wall and ceiling areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paints and dark-toned paint finishes highlight surface defects; consider the use of textures to hide these minor visual imperfections.

Limitations

- Avoid exposure to excessive or continuous moisture and extreme temperatures. Do not expose gypsum board to temperatures exceeding 125°F (52°C) for extended periods of time.
- Properly ventilate or condition attic spaces to remove moisture buildup above gypsum board ceilings. If required, install a vapor retarder in exterior ceilings behind gypsum board.

- Avoid installing gypsum board directly over insulation blankets with facer flanges placed continuously across the face of the framing members; recess insulation blankets and attach flanges to the sides of framing.
- Isolate gypsum board from contact with building structure in locations where structural movement may impose direct loads on gypsum board assemblies.
- Provide control joints spaced not more than 30 ft. (9,144 mm) where employing long continuous runs of walls, partitions or ceilings without perimeter relief.
- Avoid gypsum board joints on single layer, or on the face layer on two-layer applications within 12 in. (305 mm) of the corners of window or door frames unless installing control joints at the door frame corners.
- Space supporting framing for single-layer application of 3/4 in. (19.1 mm) gypsum board a maximum of 24 in. (610 mm) o.c.

For More Information**ARCHITECTURAL SPECIFICATIONS**

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



Foil Back

Gypsum Board

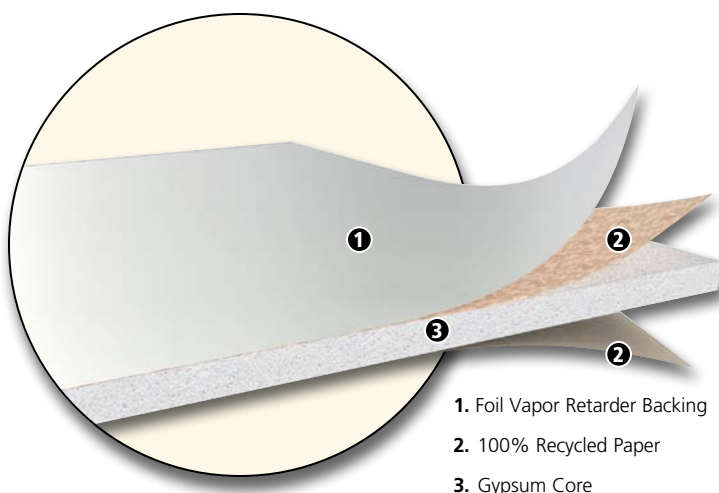
Gold Bond® BRAND Foil Back Gypsum Board consists of a fire-resistant gypsum core with a heavy, natural finish and 100-percent recycled paper on the face and a strong liner paper on the back side. A Type III aluminum foil vapor retarder, laminated to the back surface, is designed to prevent condensation from occurring within the wall cavity.

Use it on the interior face of exterior walls and ceilings in new construction and remodeling with furred masonry, wood or steel framing. It is effective for single-layer applications and as a base layer in double-layer applications that require a vapor retarder of 1 perm or less.

For speed of installation, GridMarX® guide marks are printed on the paper surface.

Sizes: 1/2 in. (12.7 mm) thick boards are available in 4 ft. (1,219 mm) widths and are available in standard lengths of 8 ft. (2,438 mm) to 16 ft. (4,877 mm). 5/8 in. (15.9 mm) thick boards are available in 4 ft. (1,219 mm) and 54 in. (1,372 mm) widths and standard lengths of 8 ft. (2,438 mm) to 16 ft. (4,877 mm).

Finishing: Long edges of the boards are tapered or square. Tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set™ Setting Compounds.



1. Foil Vapor Retarder Backing
2. 100% Recycled Paper
3. Gypsum Core

**Gold
Bond**
BRAND
Gypsum Board

National
Gypsum®

Foil Back Gypsum Board

Basic Uses

APPLICATIONS

- Use 1/2 in. (12.7 mm) Foil Back Gypsum Board for the interior face of exterior walls and ceilings where a vapor retarder is required. Also use it in non-fire-rated construction where framing members are spaced up to 24 in. (610 mm) o.c.
- Use 5/8 in. (15.9 mm) Foil Back Gypsum Board where enhanced fire safety and sound transmission performance are desired.

ADVANTAGES

- Optimal vapor retarder that prevents condensation from occurring in the wall cavity. In accordance with ASTM E96.
- All-in-one board reduces installation steps and offers labor savings.
- Versatile product that is appropriate for use on virtually all exterior wall and ceiling construction: wood frame, steel frame and furred masonry.
- Excellent working properties, including score and snap, reduced dust and improved strength-to-weight ratio.
- Features the GridMarX® preprinted fastening guide on the board to allow for faster and more accurate installation.

Installation Recommendations

GENERAL

- Install gypsum board in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.
- GridMarX provides quick identification and uniform nail/screw patterns. Use GridMarX to make accurate cuts without drawing lines. GridMarX guide marks run the length of the board at five points in 4 in. (102 mm) increments. Marks run along the edge in both tapers and at 16 in. (406 mm), 24 in. (610 mm) and 32 in. (813 mm) in the field of the board. The marks cover easily with no bleed-through using standard paint products.
- Apply gypsum board first to ceilings at right angles to framing members, then to walls. Use boards of maximum practical length so that the minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.
- Install batt or blanket ceiling insulation BEFORE the gypsum board on ceilings when installing a vapor retarder behind the gypsum board. Install the insulation IMMEDIATELY after the gypsum board when using loose fill insulation. Avoid installation practices that might allow condensation to form behind boards.
- Cut gypsum board to allow for a minimum 1/4 in. (6.4 mm) gap between gypsum board and floor to prevent potential wicking.
- Locate gypsum board joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Hold gypsum board in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the face paper of the gypsum board. Remove improperly driven nails or screws.

TECHNICAL DATA

PHYSICAL PROPERTIES		
	1/2" Foil Back Gypsum Board	5/8" Foil Back Gypsum Board
Thickness¹, Nominal	1/2" (12.7 mm)	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm)	4' (1,219 mm), 54" (1,372 mm)
Length^{1,4}, Standard	8' – 16' (2,438 mm – 4,877 mm)	8' – 16' (2,438 mm – 4,877 mm)
Weight, Nominal	1.6 lbs. / sq. ft. (7.81 k/m ²)	2.2 lbs. / sq. ft. (10.74 k/m ²)
Edges¹	Square or Tapered	Square or Tapered
Flexural Strength¹, Perpendicular	≥ 107 lbf. (476 N)	≥ 147 lbf. (654 N)
Flexural Strength¹, Parallel	≥ 36 lbf. (160 N)	≥ 46 lbf. (205 N)
Humidified Deflection¹	≤ 10/8" (31.8 mm)	≤ 5/8" (15.9 mm)
Nail Pull Resistance¹	≥ 77 lbf. (343 N)	≥ 87 lbf. (387 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)
Thermal Resistance⁵	R = .45	R = .56
Permeance⁶	< 0.1 perms	< 0.1 perms
Product Standard Compliance	ASTM C1396	ASTM C1396
Fire-Resistance Characteristics		
Core Type	Regular	Type X
UL Type Designation	N/A	FSW
Combustibility²	Non-combustible Core	Non-combustible Core
Surface Burning Characteristics³	Class A	Class A
Flame Spread³	15	15
Smoke Development³	0	0
Applicable Standards and References		
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products		
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus		
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board		
ASTM C1396 Standard Specification for Gypsum Board		
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials		
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials		
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C		
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>		
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>		
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>		
National Gypsum Company, <i>NGC Construction Guide</i>		

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

6. Tested in accordance with ASTM E96.

Foil Back Gypsum Board

- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the gypsum board and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.

FOIL BACK GYPSUM BOARD INSTALLATION

- To maintain the performance of Foil Back Gypsum Board, repair damaged foil area using foil tape prior to installing gypsum board.
- To minimize airflow, seal penetrations, such as outlets and switches, using pads or caulk.

FINISHING

Refer to GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*, to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

DECORATION

Ensure gypsum board surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

CRITICAL LIGHTING AREAS

Wall and ceiling areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal even minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paints and dark-toned paint finishes highlight surface defects; consider the use of textures to hide these minor visual imperfections.

Limitations

- Do not use over kraft-faced insulation or other vapor retarders.
- Do not use as a base for adhesively applied vinyl or other highly water-vapor resistant wall coverings.
- Do not use as a base for ceramic or other tile or as a base layer for prefinished vinyl wall panels in double-layer assemblies.
- Do not use Foil Back Gypsum Board in hot, humid climates, such as the southern Atlantic and Gulf Coast areas.
- Do not laminate the foil surface of Foil Back to any surface.

- Avoid exposure to excessive or continuous moisture and extreme temperatures. Do not expose gypsum board to temperatures exceeding 125°F (52°C) for extended periods of time.
- Properly ventilate or condition attic spaces to remove moisture buildup above gypsum board ceilings. If required, install a vapor retarder in exterior ceilings behind gypsum board.
- Avoid installing gypsum board directly over insulation blankets with facer flanges placed continuously across the face of the framing members; recess insulation blankets and attach flanges to the sides of framing.
- Isolate gypsum board from contact with building structure in locations where structural movement may impose direct loads on gypsum board assemblies.
- Provide control joints spaced not more than 30 ft. (9,144 mm) where employing long continuous runs of walls, partitions or ceilings without perimeter relief.
- Avoid gypsum board joints within 12 in. (305 mm) of the corners of window or door frames unless installing control joints at these locations.
- Space supporting framing for single-layer application of 1/2 in. (12.7 mm) and 5/8 in. (15.9 mm) gypsum board a maximum of 24 in. (610 mm) o.c.
- To prevent objectionable sag in gypsum board ceilings, the weight of overlaid, unsupported insulation should not exceed the following recommendations:

CEILING-SUPPORTED INSULATION		
Type	Regular	Type X
Thickness, Nominal	1/2" (12.7 mm)	5/8" (15.9 mm)
Framing Spacing	24" o.c. (610 mm)	24" o.c. (610 mm)
Weight of Ceiling-Supported Insulation	1.3 psf (6.3 kg/m ²)	2.2 psf (10.7 kg/m ²)

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



High Flex®

Gypsum Board

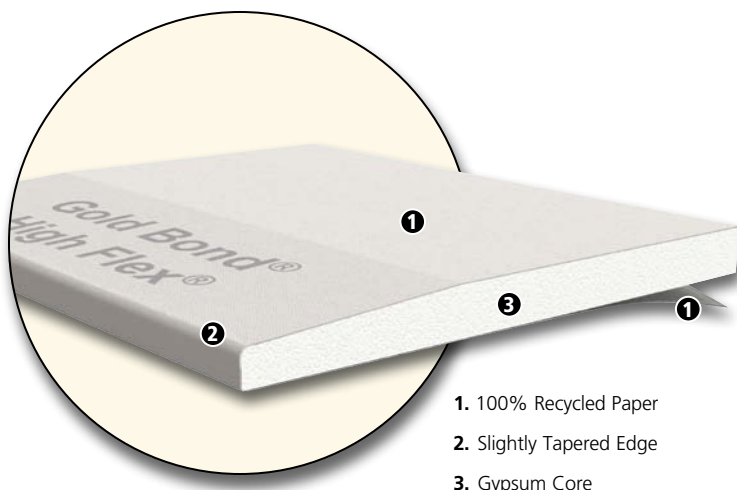
Gold Bond® BRAND High Flex® Gypsum Board consists of a fire-resistant gypsum core encased in a heavy, natural finish with 100-percent recycled paper on the face and back sides. The face paper is folded around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth.

Use it for interior, non-fire-rated wall and ceiling applications. High Flex® is ideal for concave and convex surfaces, such as walls, arches and vaulted ceilings. Apply it in double layers.

For speed of installation, GridMarX® guide marks are printed on the paper surface.

Sizes: 1/4 in. (6.4 mm) thick boards are available in 4 ft. (1,219 mm) widths and standard lengths of 8 ft. (2,438 mm).

Finishing: Slightly tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set™ Setting Compounds.



1. 100% Recycled Paper
2. Slightly Tapered Edge
3. Gypsum Core

**Gold
Bond**
BRAND
Gypsum Board

National
Gypsum®

Basic Uses

APPLICATIONS

Use High Flex® Gypsum Board for curved surfaces in non-rated assemblies, such as curved walls, arches and vaulted ceilings. Use it for both concave and convex surfaces. Apply it in double layers.

ADVANTAGES

- Lightweight, cost-efficient flexible material that conforms to curved profiles and is compatible with a wide range of decorative finishes.
- Cuts easily for quick installation, permitting painting or other decoration and the installation of metal or wood trim almost immediately.
- Fire-resistant material with a gypsum core that will not support combustion or transmit temperatures greatly in excess of 212°F (100°C) until completely calcined, a slow process.
- Dimensionally stable under changes in temperature and relative humidity and resists warping, rippling, buckling and sagging.
- Features the GridMarX® preprinted fastening guide on the board to allow for faster and more accurate installation.

Installation Recommendations

GENERAL

- Install gypsum board in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.
- GridMarX provides quick identification and uniform nail/screw patterns. Use GridMarX to make accurate cuts without drawing lines. GridMarX guide marks run the length of the board at five points in 4 in. (102 mm) increments. Marks run along the edge in both tapers and at 16 in. (406 mm), 24 in. (610 mm) and 32 in. (813 mm) in the field of the board. The marks cover easily with no bleed-through using standard paint products.
- Apply gypsum board first to ceilings at right angles to framing members, then to walls. Use boards of maximum practical length so that the minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.
- Install batt or blanket ceiling insulation BEFORE the gypsum board on ceilings when installing a vapor retarder behind the gypsum board. Install the insulation IMMEDIATELY after the gypsum board when using loose fill insulation. Avoid installation practices that might allow condensation to form behind boards.
- Cut gypsum board to allow for a minimum 1/4 in. (6.4 mm) gap between gypsum board and floor to prevent potential wicking of moisture.
- Locate gypsum board joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Hold gypsum board in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the face paper of the gypsum board. Remove improperly driven nails or screws.

TECHNICAL DATA

PHYSICAL PROPERTIES	
	High Flex Gypsum Board
Thickness¹, Nominal	1/4" (6.4 mm)
Width¹, Nominal	4' (1,219 mm)
Length^{1,4}, Standard	8' (2,438 mm)
Weight, Nominal	0.95 lbs. / sq. ft. 4.64 k/m ²)
Edges¹	Slightly Tapered
Flexural Strength¹, Perpendicular	≥ 46 lbf. (205 N)
Flexural Strength¹, Parallel	≥ 16 lbf. (71 N)
Humidified Deflection¹	N/A
Nail Pull Resistance¹	≥ 36 lbf. (160 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)
Bending Radius	Refer to chart on page 114.
Thermal Resistance⁵	N/A
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	Regular
UL Type Designation	N/A
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	15
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>	
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>	
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the gypsum board and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.

HIGH FLEX® GYPSUM BOARD INSTALLATION

- To prevent flat spots, space framing members closer together than required for typical flat wall and ceiling surfaces.
- For concave surfaces: Apply a stop to one end of the curve to restrain one end or edge of the board while installing. Apply pressure to unrestrained end or edge of the gypsum board, forcing the field of the gypsum board into firm contact with the framing. Fasten gypsum board by working from the “stopped” end or edge. Hold gypsum board tightly against the framing while driving fasteners.
- For convex surfaces: Attach one end of the gypsum board to the framing with nails or screws. Progressively push gypsum board into contact with the framing members, working from the fixed end to the free end. Hold gypsum board tightly against each framing member while driving fasteners.

CURVED SURFACES

To apply gypsum board over a curved surface, place a stop at one end of the board and then gently and gradually push on the other end, forcing the center against the framing until the curve is complete. To achieve shorter radii than shown in the accompanying table, moisten the face and back papers of the board with water, stacking on a flat surface, and allowing the water to soak into the core. When the board is dry, it will regain its original hardness.

Apply High Flex® Gypsum Board to curved surfaces in accordance with the following:

MINIMUM BENDING RADII

Application	Bend Radii	Maximum Stud Spacing
Lengthwise		
Inside (Concave) Dry	32" (813 mm)	9" (229 mm) o.c.
Outside (Convex) Dry	30" (762 mm)	9" (229 mm) o.c.
Inside (Concave) Wet	20" (508 mm)	9" (229 mm) o.c.
Outside (Convex) Wet	14" (356 mm)	6" (152 mm) o.c.
Widthwise		
Inside (Concave) Dry	20" (508 mm)	9" (229 mm) o.c.
Outside (Convex) Dry	15" (381 mm)	8" (203 mm) o.c.
Inside (Concave) Wet	10" (254 mm)	6" (152 mm) o.c.
Outside (Convex) Wet	7" (178 mm)	5" (127 mm) o.c.

Lengthwise denotes long edges perpendicular to the framing members. Widthwise denotes long edges parallel to the framing members. The values listed above were achieved at 65°F and 45-percent relative humidity. Lower temperatures and lower humidity will decrease the flexibility.

Wetting the boards is only required on extremely tight radii, or when temperature and humidity conditions are lower than 65°F and 45-percent relative humidity. When wetting the boards, apply 10-15 ounces of clean water per side with a paint roller or sprayer. Allow to soak for 10-15 minutes before bending.

FINISHING

Refer to GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*, to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

DECORATION

Ensure gypsum board surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

CRITICAL LIGHTING AREAS

Wall and ceiling areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal even minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paint and dark-toned paint finishes highlight surface defects; consider the use of textures to hide these minor visual imperfections.

Limitations

- Avoid exposure to excessive or continuous moisture and extreme temperatures. Do not expose gypsum board to temperatures exceeding 125°F (52°C) for extended periods of time.
- Properly ventilate or condition attic spaces to remove moisture buildup above gypsum board ceilings. If required, install a vapor retarder in exterior ceilings behind gypsum board.
- Avoid installing gypsum board directly over insulation blankets with facer flanges placed continuously across the face of the framing members; recess insulation blankets and attach flanges to the sides of framing.
- Isolate gypsum board from contact with building structure in locations where structural movement may impose direct loads on gypsum board assemblies.
- Provide control joints spaced not more than 30 ft. (9,144 mm) where employing long continuous runs of walls, partitions or ceilings without perimeter relief.
- Avoid gypsum board joints within 12 in. (305 mm) of the corners of window or door frames unless installing control joints at these locations.
- Space supporting framing for single-layer application of 1/2 in. (12.7 mm) and 5/8 in. (15.9 mm) gypsum boards for a maximum of 24 in. (610 mm) o.c.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



Durasan®

Prefinished Gypsum Board

Gold Bond® BRAND Durasan® Prefinished Gypsum Board consists of a fire-resistant gypsum core in a heavy, natural finish with 100-percent recycled paper on the face and back sides and an additional vinyl covering on the panel. The long edges of all Durasan® Prefinished Gypsum Board are beveled and wrapped with decorative vinyl.

Apply Durasan directly to metal or wood studs or as a finish layer over gypsum board. It is ideal for most demountable partition systems.

Durasan eliminates the need for joint treatment and paint, resulting in time and labor savings.

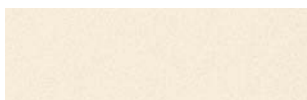
Sizes: 1/2 in. (12.7 mm) thick Regular Gypsum Boards are available in 4 ft. (1,219 mm) widths and standard lengths of 8 ft. (2,438 mm) to 10 ft. (3,048 mm). 5/8 in. (15.9 mm) thick Type X Boards are available in 4 ft. (1,219 mm) and 54 in. (1,372 mm) widths and standard lengths of 8 ft. (2,438 mm) to 10 ft. (3,048 mm).

PATTERN AND COLOR SELECTION

Group 1 – Stipple



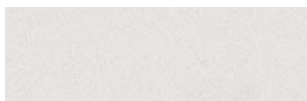
Champagne



Chiffon



Off White



Cloud

Group 3 – Santa Fe



Porcelain



Adobe

Group 3 – Harvest



Cotton



Oyster White



Rice



Color accuracy of these Durasan Gypsum Board patterns is limited in printing. Therefore, it is suggested that reference also be made to actual samples in the Durasan Pocket Selector. Contact your National Gypsum Sales Representative for Selectors and for information on Durasan Board delivery schedules in your area.

Durasan Patterns by Price Group (in order of ascending value):

Group 1 – Stipple; Group 3 – Santa Fe, Harvest



Basic Uses

APPLICATIONS

Apply Durasan® directly to studs or as a finish layer over gypsum board. It is ideal for most demountable partition systems.

ADVANTAGES

- Prefinished Durasan eliminates the need for joint treatment or paint, resulting in time and labor savings.
- Offers a wide variety of stylish patterns and colors.
- Color permanence: The high-quality vinyl surface offers good fade resistance. The vinyl films are specifically formulated with light-stable compounds and pigments to provide maximum stability and color retention under varying environmental conditions.
- Durasan Vinyl Gypsum Boards are extremely abrasion resistant when tested in accordance with ASTM D1044.
- Durasan® 5/8 in. (15.9 mm) Type X Gypsum Board has a specially formulated core, providing superior fire-resistive performance when used in specific fire-rated assemblies.
- The gypsum core will not support combustion or transmit temperatures greatly in excess of 212°F (100°C) until completely calcined, a slow process.
- Scores and snaps easily to exact size without sawing.

ACCESSORIES

One-piece trims: For 1/2 in. (12.7 mm) boards only. Matching vinyl laminated to an extruded vinyl form. Outside and inside corners; end cap; divider.

Two-piece trims: For 1/2 in. (12.7 mm) and 5/8 in. (15.9 mm) panels. Matching vinyl laminated to extruded vinyl, which is then attached to a steel retainer. Snap-on corners; snap-on interior trims.

Matching vinyl roll goods.

ABRASION RESISTANCE

Tested by a Taber Abraser with CS-17 calibrate wheels and a 500-gram load in accordance with ASTM D1044, Durasan withstood over 10,000 revolutions without breaking through the vinyl film. During this testing, there was some loss of texture and overprint.

Installation Recommendations

GENERAL

- Install gypsum boards in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects before installing the gypsum board.
- Locate gypsum board joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Hold gypsum boards in firm contact with the framing member while driving fasteners. Set fasteners with heads slightly below the surface of the boards. Take care to avoid breaking the face of the gypsum board. Remove improperly driven nails or screws.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.

TECHNICAL DATA

PHYSICAL PROPERTIES		
	1/2" Durasan Prefinished Gypsum Board	5/8" Durasan Prefinished Gypsum Board
Thickness¹, Nominal	1/2" (12.7 mm)	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm)	4' (1,219 mm), 54" (1,372 mm)
Length^{1,4}, Standard	8' – 10' (2,438 – 3,048 mm)	8' – 10' (2,438 – 3,048 mm)
Weight, Nominal	1.8 lbs. / sq. ft. (8.79 k/m ²)	2.2 lbs. / sq. ft. (10.74 k/m ²)
Edges¹	Beveled	Beveled
Flexural Strength¹, Perpendicular	≥ 107 lbf. (476 N)	≥ 147 lbf. (654 N)
Flexural Strength¹, Parallel	≥ 36 lbf. (160 N)	≥ 46 lbf. (205 N)
Humidified Deflection¹	≤ 10/8" (31.8 mm)	≤ 5/8" (15.9 mm)
Nail Pull Resistance¹	≥ 77 lbf. (343 N)	≥ 87 lbf. (387 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)
Bending Radius	N/A	N/A
Thermal Resistance⁵	R = .45	R = .56
Product Standard Compliance	ASTM C1396	ASTM C1396
Fire-Resistance Characteristics		
Core Type	Regular	Type X
UL Type Designation	N/A	FSW
Combustibility²	Non-combustible Core	Non-combustible Core
Surface Burning Characteristics³	Class A	Class A
Flame Spread³	≤ 25	≤ 25
Smoke Development³	≤ 50	≤ 50
Applicable Standards and References		
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products		
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus		
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board		
ASTM C1396 Standard Specification for Gypsum Board		
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials		
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C		
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>		
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>		
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>		
National Gypsum Company, <i>NGC Construction Guide</i>		

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the gypsum boards, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.
- Install fire-rated assemblies in accordance with the details found in the *UL Fire Resistance Directory* or Gypsum Association, GA-600, *Fire Design Manual*.

INSTALLATION OF DURASAN® PREFINISHED GYPSUM BOARD

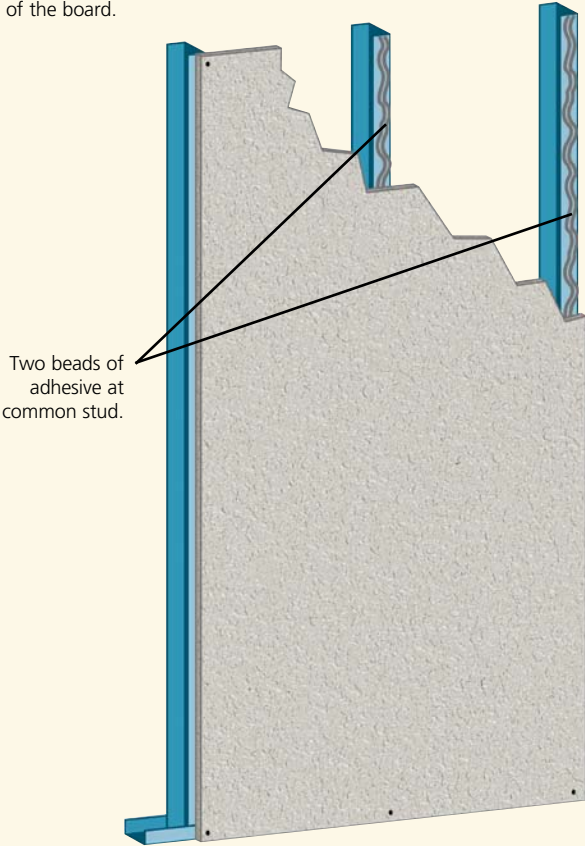
- There are several methods for installing Durasan® products in order to meet specific job requirements. As in regular gypsum board construction, install ceilings first, before erecting Durasan Boards. Attach boards vertically. Do not apply Durasan to ceilings.
- Adhesive Nail-On: To avoid visible fasteners on exposed surfaces, apply Durasan Boards to metal or wood studs or furring with adhesive. Prebow Durasan Boards overnight with the vinyl surface concave.
- You may use many water-based and solvent-based adhesives to install Durasan Prefinished Gypsum Boards. All adhesives you use to install Durasan in non-fire-rated assemblies should meet ASTM C557. Some solvent-based adhesives could cause vinyl surfaces to delaminate and/or discolor. Check the adhesive manufacturer's recommendations before using with Durasan. Before applying, subject adhesive should be test laminated to actual framing or backing.
- Apply adhesive to metal or wood studs or furring in a continuous 1/4 in. (6.4 mm) bead or intermittent 1/4 in. (6.4 mm) beads 3 in. (76.2 mm) long, 6 in. (152 mm) apart. Where board edges abut, apply two parallel beads, one along each edge of the framing member. Press the board firmly in place against the freshly applied adhesive. Then tilt board back to allow partial flash-off of solvents. Wait a minimum of 5 minutes and then reapply board in position. Nail or screw at corners only.
- **Laminate with joint compound:** Laminate Durasan Boards to existing surfaces with ProForm® BRAND Quick Set™ Setting Compound or ProForm® BRAND Ready Mix Joint Compounds. Joint compound is applied as nominal 5 in. (127 mm) ribbons of four 1/4 in. (6.4 mm) x 1/4 in. (6.4 mm) beads located around the perimeter and center of the boards. An alternate is 2 in. (50.8 mm) diameter daubs 1/2 in. (12.7 mm) thick, 16 in. (406 mm) o.c.
- **Demountable partitions:** Durasan Boards are well suited for use with many proprietary partition systems. Consult systems manufacturer for compatibility and installation requirements.
- **Trim application:** Apply plastic, wood or metal trim at both floor and ceiling. Apply trim carefully to Durasan Boards to avoid creating excessive pressure that might later cause delamination of the covering.
- **Cleaning:** To remove most common dirt and marks, rub lightly with a moistened cloth, sponge or soft hair bristle brush, using a mild soap, detergent or nonabrasive cleanser. Rinse with water and wipe dry. Safely remove more stubborn stains by wiping away excess material, scrubbing the stained area with a stiff bristle brush wetted with an appropriate solvent, and quickly wiping dry with a clean cloth.
- **Patching:** Save scraps of Durasan in case patching a damaged area is necessary. When patching small rips or tears, remove the laminate from a Durasan scrap. Place this patch over the damaged area and, using a razor blade or very sharp knife, make straight cuts through both layers of laminate. Remove the damaged laminate underneath and cement the patch in its place with a good quality, vinyl-to-vinyl adhesive.

Limitations

- Durasan Vinyls are vapor retarders (less than 1 perm). Do not place a second vapor retarder behind these products.
- Do not use in areas where surface temperatures will exceed 125°F (52°C). Do not use Durasan behind stoves where direct heat or steam could affect the board covering.
- Do not use Durasan around bath tubs, in shower enclosures, or in areas where boards will be subject to free moisture.

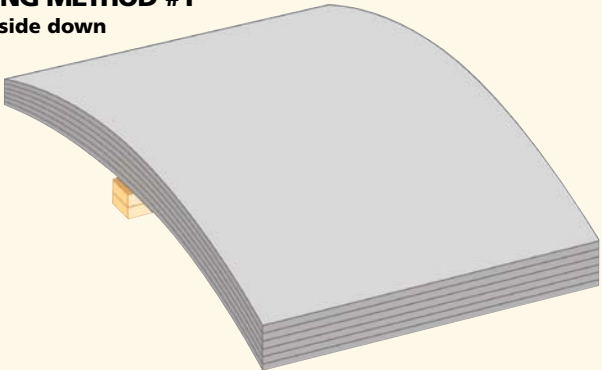
APPLICATION – ADHESIVE

Nailing or screwing is required only at top and bottom of Durasan® Prefinished Gypsum Boards when adhesive is applied and boards are prebowed to give pressure at the center of the board.



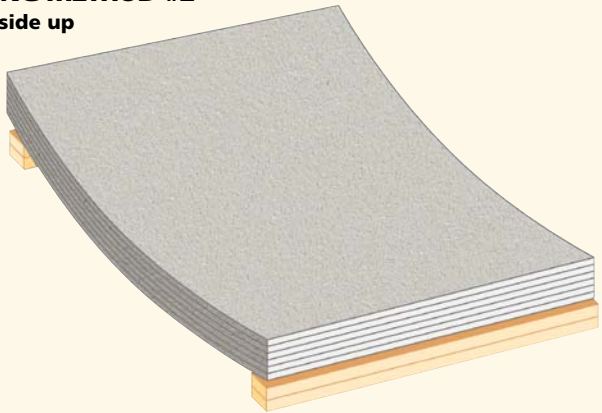
BOWING METHOD #1

Finish side down



BOWING METHOD #2

Finish side up



Gold Bond®
Boards / Plaster

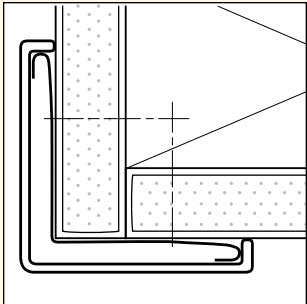
SNAP-ON TRIM

- 1. Apply Durasan and base trim in normal manner before installing outside corner trim, then proceed with any interior ceiling and corner trim.
- 2. Cut steel retainers to fit outside corners, interior ceiling and corner trim.
- 3. Nail or screw attach retainer strip. Space fasteners 8 in. (203 mm) o.c. for interior ceiling and corner retainers, and 12 in. (305 mm) o.c. for outside corner retainers. All retainers should begin fasteners 1/2 in. (12.7 mm) from each end.

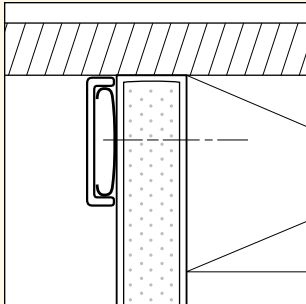
- 4. Cut face cover to length with tin snip or miter cut. After cutting cover, restore flanges to original configuration by using a screwdriver blade as a wedge. Snap cover over retainer by engaging one leg on retainer flange. Then use palm or thumb pressure until opposite leg engages retainer flange and snaps into place.

SNAP-ON TRIM APPLICATION METHODS

Exterior Corner



Interior Corner



Durasan® Prefinished Gypsum Board

- If applying Durasan® over treated lumber, conduct tests prior to application to be sure the chemical treatment of the wood does not affect the bond or color of the board covering.
- Do not apply Durasan Boards over wet or damp masonry walls. Mildew or staining problems could result if the walls are not dry or will not remain dry.
- Take care during application to ensure the boards applied on single walls or visual areas are color matched to minimize any such variations in the vinyl covering.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



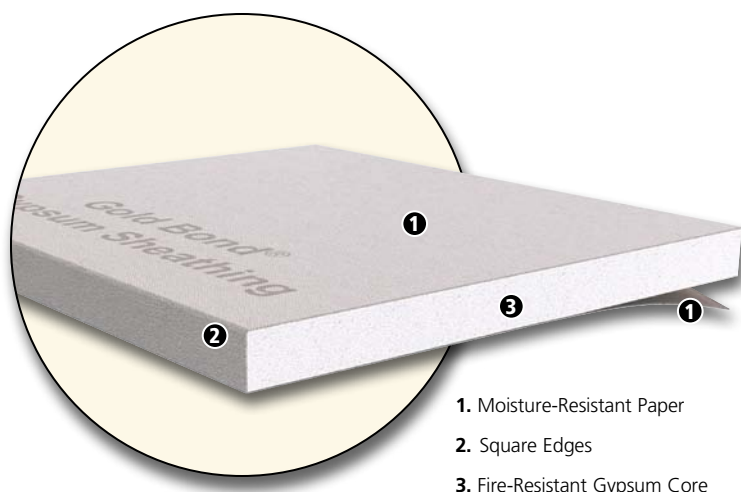
Gypsum Sheathing

Gold Bond® BRAND Gypsum Sheathing is a moisture-resistant sheathing installed on the outside of exterior framing as a substrate for exterior claddings. It is manufactured with a treated water-resistant core and faced with moisture-resistant paper on both faces and on both long edges.

Use it for exterior, fire-rated sheathing applications. 5/8 in. (15.9 mm) Gypsum Sheathing has a Type X core for use in fire-rated assemblies.

For speed of installation, GridMarX® guide marks are printed on the paper surface.

Sizes: 5/8 in. (15.9 mm) thick Type X Sheathing is available in a 4 ft. (1,219 mm) width and standard lengths of 8 ft. (2,438 mm) to 10 ft. (3,048 mm).



Gold Bond®
Bond BRAND
Gypsum Board

National 
Gypsum®

Basic Uses

APPLICATIONS

- Use it as a sheathing on wood or steel framing to provide fire resistance and moisture protection when used under exterior claddings, such as wood, vinyl and fiber cement siding, masonry veneer, Exterior Insulation and Finish Systems (EIFS) and stucco.
- Use it as a sheathing for fire-resistance-rated exterior wall assemblies.

ADVANTAGES

- Fire-resistant material with a non-combustible gypsum core of gypsum sheathing helps protect framing elements even when the siding or finish material is combustible. Gypsum sheathing does not require taping of joints in fire-rated exterior wall assemblies.
- The moisture-resistant core and face paper provide a durable substrate for weather resistant barriers.
- For ease of installation, score and snap gypsum sheathing to exact size without sawing.
- Dimensionally stable under changes in temperature and relative humidity and resists warping, rippling, buckling and sagging.
- Features the GridMarX® preprinted fastening guide on the board to allow for faster and more accurate installation.

Installation Recommendations

GENERAL

- Install gypsum board in accordance with methods described in ASTM C1280 and GA-253.
- Use boards of maximum practical length so that the minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.

GYPSUM SHEATHING

Install gypsum sheathing panels vertically or horizontally with vertical edges butting over the center of framing members. Fit sheathing snugly around all openings.

Install sheathing with a 3/8 in. (9.5 mm) gap where non-loadbearing construction abuts structural elements.

Install sheathing with a 1/4 in. (6.4 mm) gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

VINYL, WOOD AND FIBER CEMENT SIDING

Apply horizontal siding and vertical siding directly over gypsum sheathing covered with weather resistant barrier. Butt siding joints over framing members. Fasteners should have a minimum 1 in. (25.4 mm) penetration into each wood framing member and penetration of each metal framing member recommended by fastener manufacturer.

STUCCO

Nail or screw 3.4 lb. self-furring galvanized Diamond Mesh metal lath through gypsum sheathing into the framing. Install metal lath immediately after installing gypsum sheathing and weather resistant barrier.

BRICK VENEER

Wall ties for masonry veneer should be fastened through gypsum sheathing with fasteners that penetrate a minimum of 1 in. (25.4 mm) into each wood framing member and penetration of each metal framing member recommended by fastener manufacturer. Maintain an air space of minimum 2 in. (50.8 mm) between gypsum sheathing and brick veneer per recommendations of the Brick Institute of America.

TECHNICAL DATA

PHYSICAL PROPERTIES	
Gypsum Sheathing	
Thickness¹, Nominal	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm)
Length^{1,4}, Standard	8' – 10' (2,438 – 3,048 mm)
Weight, Nominal	2.3 lbs. / sq. ft. (11.23 k/m ²)
Edges¹	Square
Flexural Strength¹, Perpendicular	≥ 147 lbf. (654 N)
Flexural Strength¹, Parallel	≥ 46 lbf. (205 N)
Humidified Deflection¹	≤ 5/8" (15.9 mm)
Nail Pull Resistance¹	≥ 87 lbf. (387 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)
Bending Radius	15' (4,572 mm)
Thermal Resistance⁵	R = .56
Permeance⁶	20 perms
Water Absorption¹ (% of Weight)	≤ 10%
Linear Expansion with Change Moisture	6.5 x 10 ⁻⁶ in./in./%RH
Coefficient of Thermal Expansion	9.3 x 10 ⁻⁶ in./in./°F
Racking Strength⁷ (Ultimate – not design value)	> 654 lbs./ft. (887 N/m)
Compressive Strength⁸	400 psi
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	Type X
UL Type Designation	FSW
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	20
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM E72 Standard Test Methods of Conducting Strength Tests of Panels for Building Construction	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>	
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>	
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>	
Gypsum Association, GA-253, <i>Application of Gypsum Sheathing</i>	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

6. Tested in accordance with ASTM E96.

7. Tested in accordance with ASTM E72.

8. Tested in accordance with ASTM C473, Annex X3.

SHEAR WALL APPLICATIONS WITH GYPSUM SHEATHING

For shear walls constructed with 5/8 in. (15.9 mm) Gold Bond® BRAND Gypsum Sheathing, apply sheathing vertically to studs 16 in. (406 mm) o.c. with 11-gauge, 1-3/4 in. (44.5 mm) long, galvanized nails 4 in. (102 mm) o.c. at edges and 8 in. (203 mm) o.c. at intermediate studs.

Corner Bracing: Where continuous diagonal bracing is required, many building codes allow the use of 48 in. (1,219 mm) wide 5/8 in. (15.9 mm) gypsum sheathing panels applied vertically to be used in place of 1 in. (25.4 mm) x 4 in. (102 mm) wood let-in or metal strap bracing.

Shear Walls: Where wind or seismic forces require shear walls to resist these lateral forces, most building codes provide allowable shear values for walls having gypsum sheathing applied vertically to framing. Specific values with construction requirements and limitations are contained in the model building code (ICC: International Building Code [IBC] and International Residential Code for One- and Two-Family Dwellings [IRC]). Shear values for all gypsum panels, including gypsum sheathing, are defined in GA-229, *Shear Values for Screw Application of Gypsum Board on Walls* at: gypsum.org.

Install gypsum sheathing in accordance with National Gypsum Company written recommendations and: GA-253, *Application of Gypsum Sheathing*; ASTM C 1280, *Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing*; and other standards referenced in this document.

FASTENING

Nails: Galvanized, 11-gauge, 7/16 in. (11.1 mm) head, 1-1/2 in. (38.1 mm) long for 1/2 in. (12.7 mm) sheathing and 1-3/4 in. (44.4 mm) long for 5/8 in. (15.9 mm) sheathing.

Screws: ASTM C 1002 or ASTM C 954, 1-1/4 in. (31.8 mm) long Type W for wood framing and 1 in. (25.4 mm) long Type S-12 for metal framing.

Staples: Galvanized 16-gauge, 7/16 in. (11.1 mm) crown, 1-1/2 in. (38.1 mm) long for 1/2 in. (12.7 mm) sheathing and 1-5/8 in. (41.3 mm) long for 5/8 in. (15.9 mm) sheathing.

Fastener heads should bear tightly against the face of the sheathing panel but should not cut into the facing paper. Staples should be driven with the crown parallel to the framing. Fasteners should be no less than 3/8 in. (9.5 mm) from the edges and ends of the panel. When shear values are not required, fasteners should be spaced not more than 8 in. (203 mm) o.c. along the vertical ends or edges and intermediate supports.

Limitations

- Gold Bond® BRAND Gypsum Sheathing is not a finished surface nor is it a substrate for the direct application of joint compound, stucco, paint or textures. Placement of vapor retarders within the wall assembly is the responsibility of the design professional.
- Do not use gypsum sheathing as a nailing base. Mechanical fasteners should pass through the sheathing and engage the framing member behind the sheathing.
- Install Exterior Insulation Finish Systems (EIFS) over gypsum sheathing using mechanical fasteners. The performance of EIFS and recommendation of the proper methods of attachment are the responsibility of the EIFS manufacturer.
- Install materials used in conjunction with gypsum sheathing in accordance with the respective manufacturer's recommendations.
- Do not apply gypsum sheathing below grade. Comply with building code grade clearance requirements.

- Protect gypsum sheathing from the elements and maintain in good condition prior to and following installation. Stack panels flat, with care taken to prevent sagging or damage to edges, ends or surfaces.
- Do not laminate gypsum sheathing directly to masonry surfaces; fasten panels to furring strips or framing.
- Gypsum sheathing is not intended for tile applications. For tile applications, either Gold Bond® BRAND EXP® Tile Backer or PermaBase® BRAND Cement Board are recommended.
- Gypsum sheathing is not a replacement for specific structurally engineered sheathing in shear wall designs.
- Adhesive-only application of gypsum sheathing to framing is not recommended.
- Gypsum sheathing framing supports should not exceed 24 in. (610 mm) o.c.
- Gypsum sheathing is not recommended for application to exterior ceilings and soffits. National Gypsum Company's Gold Bond® BRAND EXP® Sheathing or Gold Bond® BRAND EXP® Interior Extreme® Gypsum Panels are recommended for these conditions.
- Gypsum sheathing should be covered with a weather resistant barrier immediately after installation.
- Gypsum sheathing applied perpendicular to framing should be covered at time of application with building felt or equivalent weather resistant barrier, or horizontal joints should be sealed.

Gold Bond® BRAND Gypsum Sheathing

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.

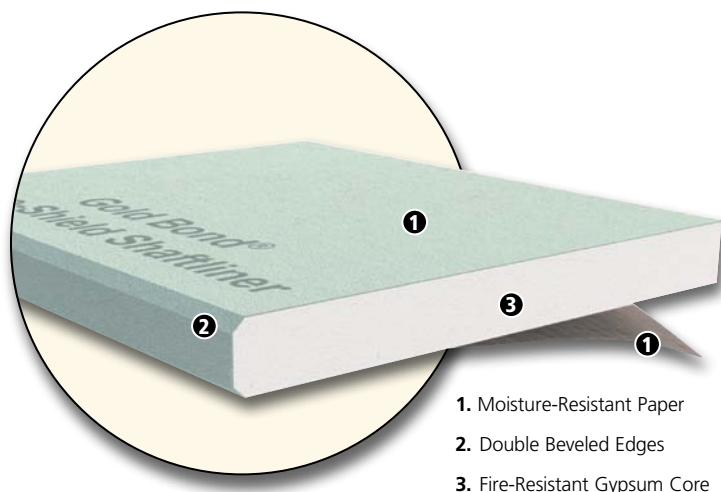
Fire-Shield® Shaftliner

Gold Bond® BRAND Fire-Shield® Shaftliner consists of a fire-resistant Type X gypsum core encased in green, heavy, moisture-resistant paper that is 100-percent recycled on the face and back sides. The face paper is folded around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth.

Use it to construct lightweight fire barriers for cavity shaftwalls (1-4 hr.) and area separation fire walls (2-hr.).

Long edges of shaftliner are double beveled to ease installation.

Sizes: 1 in. (25.4 mm) thick shaftliner is available in 2 ft. (610 mm) widths and standard lengths of 8 ft. (2,438 mm) to 12 ft. (3,658 mm).



**Gold
Bond**
BRAND
Gypsum Board

National
Gypsum®

Basic Uses

APPLICATIONS

Use Fire-Shield® Shaftliner in the construction of lightweight fire barriers for cavity shaftwalls (1-4 hr.) and area separation fire walls (2-hr.).

ADVANTAGES

- Approved component in specific UL fire-rated designs.
- Lightweight, cost-efficient material.
- Cuts easily for quick installation.
- The gypsum core will not support combustion or transmit temperatures greatly in excess of 212°F (100°C) until completely calcined, a slow process.
- Dimensionally stable under changes in temperature and relative humidity and resists warping, rippling, buckling and sagging.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Installation Recommendations

GENERAL

Install Fire-Shield Shaftliner consistent with methods described in specific application details for National Gypsum Cavity Shaftwall Systems or Area Separation Fire Wall Systems or other fire-resistance rated designs.

Limitations

- Avoid exposure to excessive or continuous moisture.
- Avoid exposure to extreme temperatures. Do not use Shaftliner in areas that will be exposed to temperatures exceeding 125°F (52°C) for extended periods of time.
- Do not use shaftliner boards in an unlined air-supply duct.
- Refer to height limitations in the applicable *NGC Construction Guide* section. Refer to page 351.
- Isolate shaftliner from contact with building structure in locations where structural movement may impose direct loads on shaftliner assemblies.

TECHNICAL DATA

PHYSICAL PROPERTIES	
	Fire-Shield Shaftliner
Thickness¹, Nominal	1" (25.4 mm)
Width¹, Nominal	2' (610 mm)
Length^{1,4}, Standard	8' – 12' (2,438 – 3,658 mm)
Weight, Nominal	3.75 lbs. / sq. ft. (18.31 k/m ²)
Edges¹	Double Beveled
Flexural Strength¹, Perpendicular	≥ 228 lbf. (1,014 N)
Flexural Strength¹, Parallel	≥ 77 lbf. (343 N)
Humidified Deflection¹	N/A
Nail Pull Resistance¹	≥ 87 lbf. (387 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)
Thermal Resistance⁵	R = .83
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	Type X
UL Type Designation	FSW
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	15
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>	
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>	
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

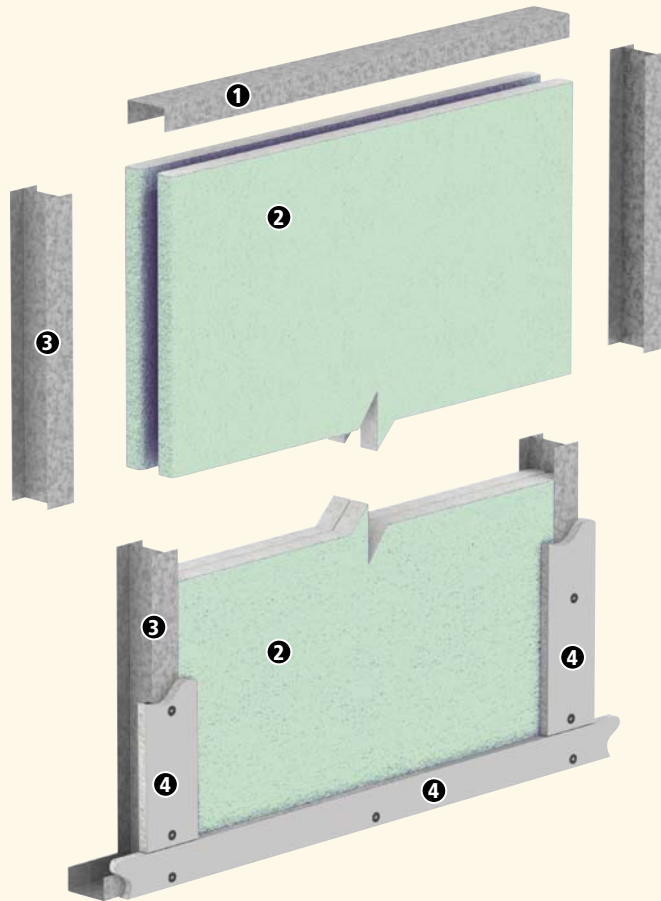
4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

Gold Bond® BRAND Fire-Shield® Shaftliner

BASIC COMPONENTS OF AREA SEPARATION WALL

1. 2" C-Track
2. 1" Fire-Shield Gypsum Shaftliner
3. 2" H-Stud
4. 1/2" Fire-Shield C Gypsum Batten



For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL** (628-4662) or visit our website: nationalgypsum.com.



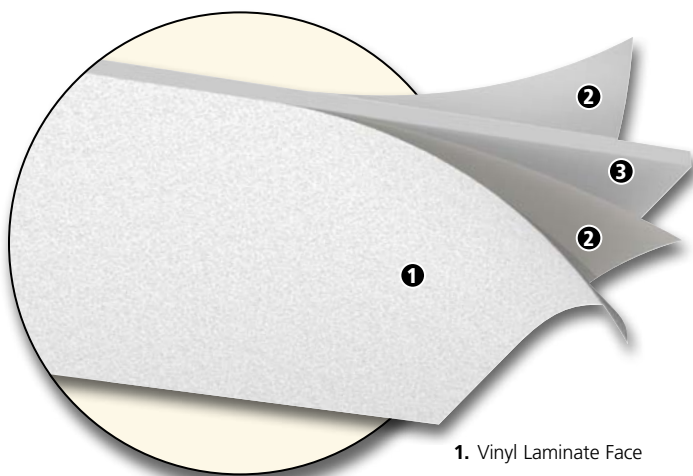
Gridstone®

Gypsum Ceiling Panels

Gold Bond® BRAND Gridstone® Gypsum Ceiling Panels consist of a 1/2 in. (12.7 mm) non-combustible, Fire-Shield® G Gypsum Core with a 2-mil white, stipple-textured vinyl laminate face that combines high light reflectance with easy cleanability.

Use it in interior and unexposed exterior ceiling applications, such as soffits, parking garages, kitchens and baths. Panels are accepted by the USDA for use in food service and food processing areas.

Sizes: 1/2 in. (12.7 mm) thick Type X Panels are available in 2 ft. (610 mm) widths and in standard lengths of 2 ft. (210 mm) and 4 ft. (1,219 mm).



1. Vinyl Laminate Face
2. 100% Recycled Paper
3. Gypsum Core

Gold Bond®
Bond
BRAND
Gypsum Board

National
Gypsum®

Basic Uses

APPLICATIONS

Use Gridstone® Gypsum Ceiling Panels in interior and unexposed exterior ceiling applications, such as soffits, parking garages, kitchens and baths.

ADVANTAGES

- Gridstone Gypsum Ceiling Panels install easily in standard exposed grid systems.
- A non-combustible gypsum core assures fire safety with 1-1/2- and 2-hour fire ratings achievable depending on installation.
- The sturdy white vinyl laminate eliminates additional finishing.
- The rigid gypsum core prevents sagging and warping problems and is backed by a 15-year limited warranty.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Installation Recommendations

GENERAL

- Provide cross ventilation in unheated or enclosed space above ceiling panels.
- Install Gridstone Panels in lay-in suspension systems with edges concealed by flanges of suspension members.
- Gridstone Panels are designed to be mounted in standard 15/16 in. (24 mm) exposed tee grid systems or environmental-type grids for severe conditions, with grids either 24 in. (610 mm) x 24 in. (610 mm) or 24 in. (610 mm) x 48 in. (1,219 mm). Grid installation should be conducted according to manufacturer's specification.
- Vinyl laminate on face of Gridstone Panels is directional. Install with all factory edges parallel (same direction).
- Each panel must be continuously supported on all four edges.
- Cut panels to fit tightly at borders and penetrations so that cut edges are concealed by trim pieces and escutcheons.
- If panel cuts are required, seal exposed core with drywall primer to maintain performance of the system.
- **Cleaning:** Remove common dirt and stains on the vinyl surface with mild soap or detergent in lukewarm water. Use a light scrubbing action with a cloth, sponge or soft brush. If the suitability of any cleaning agent is unknown, check its effect on the Gridstone Panel surface in a hidden area or on a scrap piece before attempting to remove a field stain.

DECORATION

Gridstone Panels are factory finished decorative products that do not require painting. However, if desired, paint Gridstone with the following products:

1. Oil primer with finish coat of oil or latex paint.
2. Two coats of latex paint.

TECHNICAL DATA

PHYSICAL PROPERTIES	
Gridstone Gypsum Ceiling Panels	
Thickness¹, Nominal	1/2" (12.7 mm)
Width¹, Nominal	2' (610 mm)
Length¹, Standard	GB 5044 – 2' (610 mm) actual size is 23-3/4" x 23-3/4" GB 5045 – 4' (1,219 mm) actual size is 23-3/4" x 47-3/4"
Weight, Nominal	2.2 lbs. / sq. ft. (10.74 k/m ²)
Edges¹	Square
Finish Face	2-mil White Stipple Vinyl Laminate
Finish Back	N/A
Predecorated Gypsum Board¹	Class I
Ceiling Attenuation Class (CAC)^{4,5}	46 dB
Light Reflectance⁵	LR 1 (75% or greater)
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	Type X
UL Type Designation	FSW-G
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	5
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
ASTM E1264 Standard Classification for Acoustical Ceiling Board	
ASTM E1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Tested in accordance with ASTM E1414.

5. Tested in accordance with ASTM E1264, Type XX, Patterns E and G.

Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

Limitations

- Do not install panels in areas exposed to extreme or continuous moisture, such as saunas, steam rooms, gang showers and indoor pool enclosures.
- Do not exceed 104° F (40° C) or 90-percent relative humidity prior to, during and after installation.
- For exterior application, protect grid panels from direct exposure to weather, water and continuous high humidity.
- Limit supported insulation to 1.6 psf (4.88 k/m²).
- Overlaid insulation may cause excessive panel deflection and is not recommended where high humidity is likely to occur.
- Extreme lighting conditions may distort texture appearance.
- Do not use strong organic solvents (such as ketones), harsh abrasive cleaners or steel wool. These materials may cause dulling, discoloration, softening and other permanent damage to the vinyl surface.

HANDLING AND PROJECT CONDITIONS

- Avoid water exposure during shipping, handling, storage and installation, and after installation of gypsum ceiling panels in order to avoid the formation of mold or mildew.
- Remove nonbreathable shipping wrap material upon receiving and storing gypsum panels.
- Store gypsum ceiling panels off the ground and under cover. Use sufficient supports extending under the entire length of gypsum board to prevent sagging.
- Keep gypsum ceiling panels dry to minimize the potential for mold growth. Take adequate care while transporting, storing, applying and maintaining gypsum ceiling panels. For additional information, refer to GA-238, which is available at gypsum.org under the "Download Gypsum Association Publications" section.

- Protect gypsum ceiling panels from the elements and maintain in good condition prior to and following installation. Stack panels flat, with care taken to prevent sagging or damage to edges, ends or surfaces.
- Do not install gypsum ceiling panels with visible signs of mold growth. Do not apply gypsum ceiling panels over other building materials where conditions exist that are favorable to mold growth.
- Do not exceed 95°F (35°C) when using a temporary heat source.
- Refer to GA-801 for complete handling and storage instructions.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



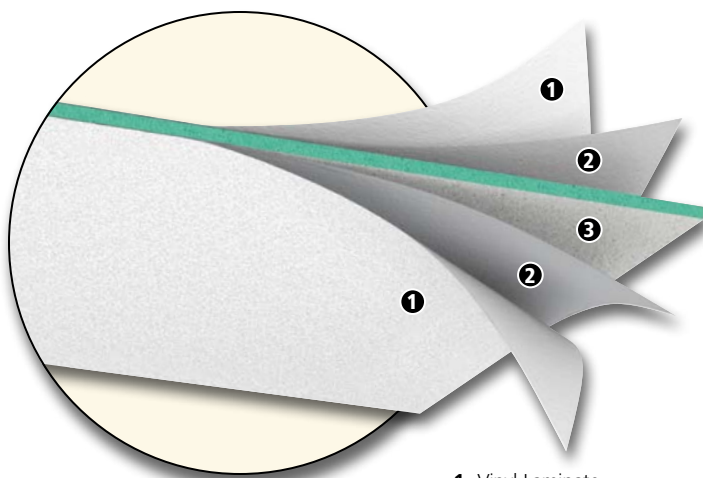
Gridstone® CleanRoom

Gypsum Ceiling Panels

Gold Bond® BRAND Gridstone® CleanRoom Gypsum Ceiling Panels consist of a non-combustible, 1/2 in. (12.7 mm) Fire-Shield® G Gypsum Core with a 2-mil white, stipple-textured vinyl laminate face that combines high light reflectance with easy cleanability and a clear vinyl laminate back. Gridstone® CleanRoom Gypsum Ceiling Panels are manufactured with the exposed edges sealed, providing a durable coating that completely seals the panel.

It is designed for areas requiring high levels of air cleanliness or airborne particulate levels, such as clean rooms and clean zones. Gridstone Panels are USDA accepted for use in food service and food processing areas.

Sizes: 1/2 in. (12.7 mm) thick Type X Panels are available in 2 ft. (610 mm) widths and in standard lengths of 2 ft. (610 mm) and 4 ft. (1,219 mm).



1. Vinyl Laminate
2. 100% Recycled Paper
3. Gypsum Core

**Gold
Bond**
BRAND
Gypsum Board

National
Gypsum®

Basic Uses

APPLICATIONS

Use Gridstone® CleanRoom Gypsum Ceiling Panels for areas requiring high levels of air cleanliness or airborne particulate levels such as clean rooms and clean zones.

ADVANTAGES

- Designed for clean room use. Approved for use in systems Class 100,000, Class 10,000, Class 1,000, Class 100 per federal standard 209E “Airborne Particulate Cleanliness Classes in Clean Rooms and Clean Zones.”
- A non-combustible gypsum core assures fire safety with 1-1/2- and 2-hour fire ratings achievable depending on installation.
- Durable white vinyl laminate eliminates additional finishing.
- Gridstone CleanRoom Ceiling Panels' rigid gypsum core prevents sagging and warping problems and is backed by a 15-year limited warranty.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Installation Recommendations

GENERAL

- Provide cross ventilation in unheated or enclosed space above ceiling panels.
- Use Gridstone CleanRoom Ceiling Panels in a gasket seal suspended grid system using hold down clips. Recommended use of Gordon DS-20 Gasket Seal System or equivalent gasket-sealed grid systems designed for clean room applications.
- Install Gridstone Panels in lay-in suspension systems with edges concealed by flanges of suspension members.
- Gridstone Panels are designed to be mounted in 15/16 in. (24 mm) exposed tee grid systems or environmental-type grids for severe conditions, with grids either 24 in. (610 mm) x 24 in. (610 mm) or 24 in. (610 mm) x 48 in. (1,219 mm). Grid installation should be conducted according to manufacturer's specification.
- Vinyl laminate on face of Gridstone Panels is directional. Install with all factory edges parallel (same direction).
- Each panel must be continuously supported on all four edges.
- Cut panels to fit tightly at borders and penetrations so that cut edges are concealed by trim pieces and escutcheons.
- If panel cuts are required, seal exposed core to maintain performance of the system.
- **Cleaning:** Remove common dirt and stains with mild soap or detergent in lukewarm water. Use a light scrubbing action with a cloth, sponge or soft brush. If the suitability of any cleaning agent is unknown, check its effect on the Gridstone Panel surface in a hidden area or on a scrap piece before attempting to remove a field stain.

DECORATION

Gridstone Panels are factory finished decorative products that do not require painting. However, if desired, paint Gridstone with the following products:

1. Oil primer with finish coat of oil or latex paint.
2. Two coats of latex paint.

TECHNICAL DATA

PHYSICAL PROPERTIES	
Gridstone CleanRoom Gypsum Ceiling Panels	
Thickness¹, Nominal	1/2" (12.7 mm)
Width¹, Nominal	2' (610 mm)
Length¹, Standard	GB 5040 – 2' (610 mm) actual size is 23-3/4" x 23-3/4" GB 5030 – 4' (1,219 mm) actual size is 23-3/4" x 47-3/4"
Weight, Nominal	2.2 lbs. / sq. ft. (10.74 k/m ²)
Edges¹	Square
Finish Face	2-mil White Stipple Vinyl Laminate
Finish Back	2-mil Clear Vinyl Laminate
Predecorated Gypsum Board¹	Class I
Ceiling Attenuation Class (CAC)^{4,5}	46 dB
Light Reflectance⁵	LR 1 (75% or greater)
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	Type X
UL Type Designation	FSW-G
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	5
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
ASTM E1264 Standard Classification for Acoustical Ceiling Board	
ASTM E1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Tested in accordance with ASTM E1414.

5. Tested in accordance with ASTM E1264, Type XX, Patterns E and G.

Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

Limitations

- Do not install panels in areas exposed to extreme or continuous moisture, such as saunas, steam rooms, gang showers and indoor pool enclosures.
- Do not exceed 104° F (40° C) or 90-percent relative humidity prior to, during and after installation.
- Limit supported insulation to 1.6 psf (4.88 k/m²).
- Overlaid insulation may cause excessive panel deflection and is not recommended where high humidity is likely to occur.
- Extreme lighting conditions may distort texture appearance.
- Do not use strong organic solvents (such as ketones), harsh abrasive cleaners or steel wool. These materials may cause dulling, discoloration, softening and other permanent damage to the vinyl surface.

HANDLING AND PROJECT CONDITIONS

- Avoid water exposure during shipping, handling, storage and installation, and after installation of gypsum ceiling panels in order to avoid the formation of mold or mildew.
- Remove nonbreathable shipping wrap material upon receiving and storing gypsum panels.
- Store gypsum ceiling panels off the ground and under cover. Use sufficient supports extending under the entire length of gypsum board to prevent sagging.
- Keep gypsum ceiling panels dry to minimize the potential for mold growth. Take adequate care while transporting, storing, applying and maintaining gypsum ceiling panels. For additional information, refer to GA-238, which is available at gypsum.org under the "Download Gypsum Association Publications" section.

- Protect gypsum ceiling panels from the elements and maintain in good condition prior to and following installation. Stack panels flat, with care taken to prevent sagging or damage to edges, ends or surfaces.
- Do not install gypsum ceiling panels with visible signs of mold growth. Do not apply gypsum ceiling panels over other building materials where conditions exist that are favorable to mold growth.
- Do not exceed 95°F (35°C) when using a temporary heat source.
- Refer to GA-801 for complete handling and storage instructions.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.

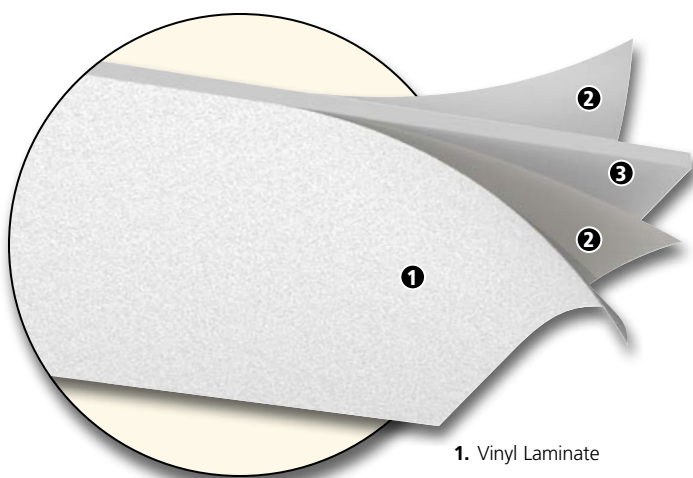


Gridstone® Hi-Strength Gypsum Ceiling Panels

Gold Bond® BRAND Gridstone® Hi-Strength Gypsum Ceiling Panels consist of a 5/16 in. (7.9 mm) non-combustible gypsum core with a 2-mil white, stipple-textured vinyl laminate face that combines high light reflectance with easy cleanability. The high strength gypsum core is formulated with increased uniformity and integrity that increases its sag resistance.

Use Gridstone® Hi-Strength Gypsum Ceiling Panels for interior and exterior ceiling applications in protected, well-ventilated spaces that receive intermittent exposure to moisture. Gridstone Panels are accepted by the USDA for use in food service and food processing areas.

Sizes: 5/16 in. (7.9 mm) thick panels are available in 2 ft. (610 mm) widths and in standard lengths of 2 ft. (610 mm) and 4 ft. (1,219 mm).



1. Vinyl Laminate
2. 100% Recycled Paper
3. Gypsum Core

**Gold
Bond**
BRAND
Gypsum Board

National
Gypsum®

Basic Uses

APPLICATIONS

Use Gridstone® Hi-Strength Gypsum Ceiling Panels for interior and exterior ceiling applications in protected, well-ventilated spaces that receive intermittent exposure to moisture.

Gridstone Panels are accepted by the USDA for use in food service and food processing areas.

Gridstone Panels are ideal for interior and unexposed exterior ceiling applications, such as soffits, parking garages and other non-fire-rated ceiling systems.

ADVANTAGES

- Gridstone® Hi-Strength 5/16 in. (7.9 mm) Gypsum Ceiling Panels are 40 percent lighter in weight than standard gypsum ceiling panels.
- Gridstone Hi-Strength Gypsum Ceiling Panels install easily in standard exposed grid systems.
- The durable white vinyl laminate eliminates additional finishing.
- Gridstone Hi-Strength Gypsum Ceiling Panels' rigid gypsum core prevents sagging and warping problems and is backed by a 15-year limited warranty.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Installation Recommendations

GENERAL

- Provide cross ventilation in unheated or enclosed space above ceiling panels.
- Install Gridstone Gypsum Ceiling Panels in lay-in suspension systems with edges concealed by flanges of suspension members.
- Gridstone Gypsum Ceiling Panels are designed to be mounted in standard 15/16 in. (24 mm) exposed tee grid systems or environmental-type grids for severe conditions, with grids either 24 in. (610 mm) x 24 in. (610 mm) or 24 in. (610 mm) x 48 in. (1,219 mm). Grid installation should be conducted according to manufacturer's specification.
- Vinyl laminate on face of Gridstone Gypsum Ceiling Panels is directional. Install with all factory edges parallel (same direction).
- Each panel must be continuously supported on all four edges.
- Cut panels to fit tightly at borders and penetrations so that cut edges are concealed by trim pieces and escutcheons.
- If panel cuts are required, seal exposed core with drywall primer to maintain performance of the system.
- **Cleaning:** Remove common dirt and stains on the vinyl surface with mild soap or detergent in lukewarm water. Use a light scrubbing action with a cloth, sponge or soft brush. If the suitability of any cleaning agent is unknown, check its effect on the Gridstone Panel surface in a hidden area or on a scrap piece before attempting to remove a field stain.

DECORATION

Gridstone Hi-Strength Gypsum Ceiling Panels are factory finished decorative products that do not require painting. However, if desired, paint Gridstone with the following products:

1. Oil primer with finish coat of oil or latex paint.
2. Two coats of latex paint.

TECHNICAL DATA

PHYSICAL PROPERTIES	
Gridstone Hi-Strength Ceiling Panels	
Thickness¹, Nominal	5/16" (7.9 mm)
Width¹, Nominal	2' (610 mm)
Length¹, Standard	GB 5020 – 2' (610 mm) actual size is 23-3/4" x 23-3/4" GB 5010 – 4' (1,219 mm) actual size is 23-3/4" x 47-3/4"
Weight, Nominal	2.2 lbs. / sq. ft. (10.74 k/m ²)
Edges¹	Square
Finish Face	2-mil White Stipple Vinyl Laminate
Finish Back	N/A
Predecorated Gypsum Board¹	Class I
Ceiling Attenuation Class (CAC)^{4,5}	41 dB
Light Reflectance⁵	LR 1 (75% or greater)
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	N/A
UL Type Designation	N/A
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	5
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
ASTM E1264 Standard Classification for Acoustical Ceiling Board	
ASTM E1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Tested in accordance with ASTM E1414.

5. Tested in accordance with ASTM E1264, Type XX, Patterns E and G.

Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

Limitations

- Do not install panels in areas exposed to extreme or continuous moisture, such as saunas, steam rooms, gang showers and indoor pool enclosures.
- Do not exceed 104° F (40° C) or 90-percent relative humidity prior to, during and after installation.
- Gridstone Hi-Strength Panels are not listed in fire-rated assemblies.
- For exterior application, protect grid panels from direct exposure to weather, water and continuous high humidity.
- Limit supported insulation to 1.6 psf (4.88 k/m²).
- Overlaid insulation may cause excessive panel deflection and is not recommended where high humidity is likely to occur.
- Extreme lighting conditions may distort texture appearance.
- Do not use strong organic solvents (such as ketones), harsh abrasive cleaners or steel wool. These materials may cause dulling, discoloration, softening and other permanent damage to the vinyl surface.

HANDLING AND PROJECT CONDITIONS

- Avoid water exposure during shipping, handling, storage and installation, and after installation of gypsum ceiling panels in order to avoid the formation of mold or mildew.
- Remove nonbreathable shipping wrap material upon receiving and storing gypsum panels.
- Store gypsum ceiling panels off the ground and under cover. Use sufficient supports extending under the entire length of gypsum board to prevent sagging.
- Keep gypsum ceiling panels dry to minimize the potential for mold growth. Take adequate care while transporting, storing, applying and maintaining gypsum ceiling panels. For additional information, refer to GA-238, which is available at gypsum.org under the "Download Gypsum Association Publications" section.
- Protect gypsum ceiling panels from the elements and maintain in good condition prior to and following installation. Stack panels flat, with care taken to prevent sagging or damage to edges, ends or surfaces.

- Do not install gypsum ceiling panels with visible signs of mold growth. Do not apply gypsum ceiling panels over other building materials where conditions exist that are favorable to mold growth.
- Do not exceed 95°F (35°C) when using a temporary heat source.
- Refer to GA-801 for complete handling and storage instructions.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



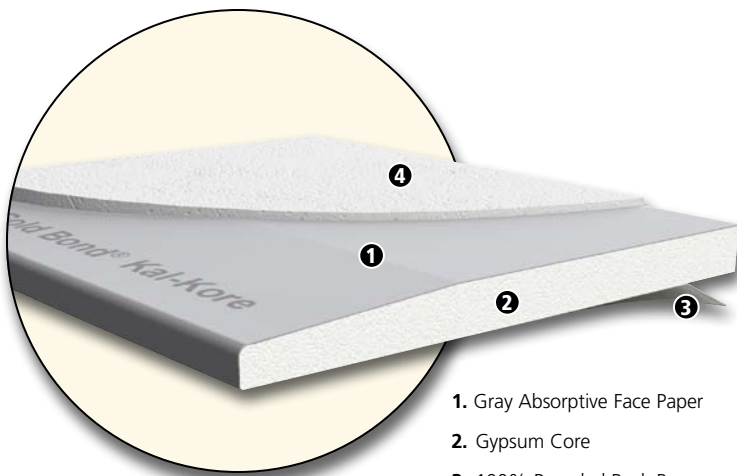
Kal-Kore® Plaster Base

Gold Bond® BRAND Kal-Kore® Plaster Base is a tapered-edge gypsum plaster base with 100-percent recycled gray absorptive face paper surface designed to permit rapid trowel application of Kal-Kote® Basecoat, Uni-Kal® and X-KALibur® one-coat plasters.

Use Fire-Shield® Kal-Kore Plaster Base in specific fire-rated assemblies.

For speed of installation, GridMarX® guide marks are printed on the paper surface.

Sizes: 3/8 in. (9.5 mm) thick plaster base is available in 4 ft. (1,219 mm) widths and standard lengths of 8 ft. (2,438 mm) to 12 ft. (3,658 mm). 1/2 in. (12.7 mm) thick Lite plaster base is available in 4 ft. (1,219 mm) and 54 in. (1,372 mm) widths and standard lengths of 8 ft. (2,438 mm) to 12 ft. (3,658 mm). 1/2 in. (12.7 mm) thick plaster base C is available in 4 ft. (1,219 mm) widths and standard lengths of 8 ft. (2,438 mm) to 12 ft. (3,658 mm). 5/8 in. (15.9 mm) thick plaster base and 5/8 in. (15.9 mm) thick plaster base C are available in 4 ft. (1,219 mm) and 54 in. (1,372 mm) widths and standard lengths of 8 ft. (2,438 mm) to 12 ft. (3,658 mm).



1. Gray Absorptive Face Paper
2. Gypsum Core
3. 100% Recycled Back Paper
4. Veneer Plaster

**Gold
Bond**
BRAND
Gypsum Board

National
Gypsum®

Basic Uses

APPLICATIONS

Kal-Kore® Plaster Base and veneer plaster systems may be specified for most types of partition and ceiling constructions, including wood and steel framing, furring and masonry.

3/8 in. (9.5 mm) Kal-Kore (regular core) – For construction with framing members spaced 16 in. (406 mm) o.c.

1/2 in. (12.7 mm) Kal-Kore Lite® – For non-fire-rated construction with framing members spaced up to 24 in. (610 mm) o.c.

5/8 in. (15.9 mm) Kal-Kore Fire-Shield® and 1/2 in. (12.7 mm) and 5/8 in. (15.9 mm) Kal-Kore Fire-Shield® C – For walls and ceilings in fire-rated construction where the framing members are spaced up to 24 in. (610 mm) o.c.

ADVANTAGES

- Provides a smooth and durable base for plaster over which paint may be applied.
- Provides the appearance and surface of conventional plaster at a lower cost.
- Provides a strong bond for the application of Kal-Kote® Basecoat, Uni-Kal® and X-KALibur® veneer plasters as well as Gypsolite® Plaster.
- Can use on walls and ceilings. Can install on ceilings 24 in. (610 mm) o.c. at right angles to framing members.
- Fire-resistant material with a gypsum core will not support combustion or transmit temperatures greatly in excess of 212°F (100°C) until completely calcined, a slow process.
- Expansion and contraction under normal atmospheric changes is negligible.

Installation Recommendations

GENERAL

- Install plaster base in accordance with methods described in ASTM C844.
- Examine and inspect framing materials to which plaster base is to be applied. Remedy all defects prior to installation of the plaster base.
- Apply plaster base first to ceilings at right angles to framing members, then to walls. Use boards of maximum practical length so that a minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.
- Install batt or blanket ceiling insulation BEFORE the plaster base when installing a polyethylene vapor barrier on ceilings behind the plaster base. Install the insulation IMMEDIATELY after the plaster base when using loose fill insulation. Avoid installation practices that might allow condensation to form behind the base.
- Locate plaster base joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Hold plaster base in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the face paper of the plaster base. Remove improperly driven nails or screws.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Maintain a room temperature of not less than 40°F (4°C) during application of plaster base.

TECHNICAL DATA

PHYSICAL PROPERTIES					
	3/8" Kal-Kore Plaster Base	1/2" Kal-Kore Lite Plaster Base	1/2" Kal-Kore Fire-Shield C Plaster Base	5/8" Kal-Kore Fire-Shield X Plaster Base	5/8" Kal-Kore Fire-Shield C Plaster Base
Thickness¹, Nominal	3/8" (9.5 mm)	1/2" (12.7 mm)	1/2" (12.7 mm)	5/8" (15.9 mm)	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm)	4' (1,219 mm), 54" (1,372 mm)	4' (1,219 mm)	4' (1,219 mm), 54" (1,372 mm)	4' (1,219 mm), 54" (1,372 mm)
Length^{1,4}, Standard	8' – 12' (2,438 – 3,658 mm)	8' – 12' (2,438 – 3,658 mm)	8' – 12' (2,438 – 3,658 mm)	8' – 12' (2,438 – 3,658 mm)	8' – 12' (2,438 – 3,658 mm)
Weight, Nominal	1.3 lbs. / sq. ft. (6.35k/m ²)	1.4 – 1.5 lbs. / sq. ft. (6.84 – 7.32 k/m ²)	1.9 lbs. / sq. ft. (9.28 k/m ²)	2.2 lbs. / sq. ft. (10.74 k/m ²)	2.3 lbs. / sq. ft. (11.23 k/m ²)
Edges¹	Tapered	Tapered	Tapered	Tapered	Tapered
Flexural Strength¹, Perpendicular	≥ 77 lbf. (343 N)	≥ 107 lbf. (476 N)	≥ 107 lbf. (476 N)	≥ 147 lbf. (654 N)	≥ 147 lbf. (654 N)
Flexural Strength¹, Parallel	≥ 26 lbf. (116 N)	≥ 36 lbf. (160 N)	≥ 36 lbf. (160 N)	≥ 46 lbf. (205 N)	≥ 46 lbf. (205 N)
Humidified Deflection¹	≤ 15/8" (48 mm)	≤ 10/8" (32 mm)	≤ 10/8" (32 mm)	≤ 5/8" (15.9 mm)	≤ 5/8" (15.9 mm)
Nail Pull Resistance¹	≥ 56 lbf. (249 N)	≥ 77 lbf. (343 N)	≥ 77 lbf. (343 N)	≥ 87 lbf. (387 N)	≥ 87 lbf. (387 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)
Bending Radius	7'-6" (2,286 mm)	10' (3,048 mm)	10' (3,048 mm)	15' (4,572 mm)	15' (4,572 mm)
Thermal Resistance⁵	R = .33	R = .45	R = .45	R = .56	R = .56
Product Standard Compliance	ASTM C1396	ASTM C1396	ASTM C1396	ASTM C1396	ASTM C1396
Fire-Resistance Characteristics					
Core Type	Regular	Regular	Type C	Type X	Type C
UL Type Designation	N/A	N/A	FSK-C	FSK	FSK-C
Combustibility²	Non-combustible Core	Non-combustible Core	Non-combustible Core	Non-combustible Core	Non-combustible Core
Surface Burning Characteristics³	Class A	Class A	Class A	Class A	Class A
Flame Spread³	15	15	15	15	15
Smoke Development³	0	0	0	0	0
Applicable Standards and References					
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products					
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus					
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board					
ASTM C844 Standard Specification for Application of Gypsum Base to Receive Gypsum Veneer Plaster					
ASTM C1396 Standard Specification for Gypsum Board					
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials					
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C					
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>					
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>					
National Gypsum Company, <i>NGC Construction Guide</i>					

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

Gold Bond® BRAND Kal-Kore® Plaster Base

- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the plaster base and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.

SPACING OF FRAMING OR FURRING		
Type of Framing or Furring	Kal-Kore Thickness	Max. Spacing On Center
Walls	3/8" (9.5 mm)	16" (406 mm)*
	1/2" (12.7 mm)	24" (610 mm)*
	5/8" (15.9 mm)	24" (610 mm)
Ceilings	3/8" (9.5 mm)	N/A
	1/2" (12.7 mm)	16" (406 mm)
	5/8" (15.9 mm)	24" (610 mm)*

* Bound edge of Kal-Kore must be at right angles to framing. 16" (406 mm) maximum spacing for bound edge of Kal-Kore parallel to joists.

METAL CEILING FURRING SPANS	
Span Dimension	Furring Channel Type/Size
Up to 24" (610 mm)	Resilient furring channel, 1/2" (12.7 mm) depth
Up to 48" (1,219 mm)	Furring channel, 7/8" (22.2 mm) depth
Greater than 48" (1,219 mm)	1-5/8" (41.3 mm) steel studs may be used as ceiling furring channels provided they are secured with flanges up (open side up) at spans not to exceed: – 6' (1,829 mm) at 12" (305 mm) o.c. spacing – 5'6" (1,676 mm) at 16" (406 mm) o.c. spacing – 5' (1,524 mm) at 24" (610 mm) o.c. spacing

Note: Design Veneer Plaster Systems for installation with maximum deflection criteria of L/240.

JOINT TREATMENT

ProForm® BRAND Paper Tape Method

- Trowel Kal-Kote® Basecoat, Uni-Kal® or X-KALibur® over joint line, filling the channel formed by the tapered edges of the Kal-Kore® Board in an even fashion.
- Center drywall paper tape over the joint line and embed the tape into the soft plaster using a trowel and level the joint. Tape the full length of the joint.
- Pretreat all joints and Kal-Beads® with Kal-Kote, Uni-Kal or X-KALibur Plaster. Tightly trowel over joint line in both directions to prevent voids, feathering to a maximum width of about 6 in. (152 mm).

Paper Tape "Quick Setting" Method

- Mix Quick Set™ or Quick Set™ Lite Setting Compound per instructions. Do not contaminate compound with other materials, dirty water or previous mixes. Do not retemper mix.
- Apply Quick Set™ or Quick Set™ Lite Setting Compound to joint by hand or machine tool. Center drywall paper tape over the joint line and embed into the soft compound. Do not over-trowel to a slick surface. Leave the surface rough to provide mechanical keying of the plaster.

Kal-Mesh® Method

- Do not use self-adhering mesh.
- Center and secure Kal-Mesh® over all joints and interior angles with 1/4 in. (6.4 mm) or 5/16 in. (7.9 mm) staples.
- Position staples a maximum of 24 in. (610 mm) apart as follows:
 - Joints: at alternate edges for the run, from end to end and directly opposite one another at either end.
 - Angles: along ceiling edge only for wall-to-ceiling angles. Along one edge for wall-to-wall angles.
 - After the first staples are placed at the end of a joint or angle, pull unstapled Kal-Mesh as stapling proceeds to ensure that it will lie flat against the Kal-Kore.

Allow treated joints to set prior to general veneer plaster application.

VENEER PLASTER APPLICATION

- Apply veneer plaster over Kal-Kore using one of the following application types fully described on pages 335-344.
- Kal-Kote Basecoat over Kal-Kore and smooth finish coat of Kal-Kote Smooth Finish, Uni-Kal, or X-KALibur over basecoat, trowel finished.
- Kal-Kote Basecoat over Kal-Kore and texture coat consisting of Uni-Kal, or X-KALibur with silica sand over basecoat, float finished.
- Single smooth finish coat of Uni-Kal or X-KALibur, trowel finished.

Decoration

Jobsite conditions of temperature and humidity, mineral content of water and variances in aggregates often cause shading discoloration of the plaster. Therefore, the veneer plaster should not be considered a finished product. Plaster should be painted or decorated in some other manner. Consult paint manufacturers as to compatible products. National Gypsum recommends alkali-resistant primers formulated for use over new plaster.

PAINTING PLASTER

Various job conditions, such as suction differences, wet or only partially dry walls and reactions between paint and lime, may cause unsatisfactory paint finishes, particularly on new construction.

Alkali-resistant primers specifically formulated for use over new plaster will permit decorating with oil- or latex-type paints. Use quality paint products and follow paint manufacturer's recommendations. Finished plaster should be painted or covered to conceal possible discoloration. The paint system should be suitable for use over plaster surfaces that contain lime, which has a high pH of 10-13.

It is essential that plaster be sound and completely dry before painting. Under good drying conditions, you may paint veneer plaster 48 hours after application.

High build, heavy duty and special purpose coatings, such as epoxy, are not recommended over veneer or job-gauged lime putty finishes.

Limitations

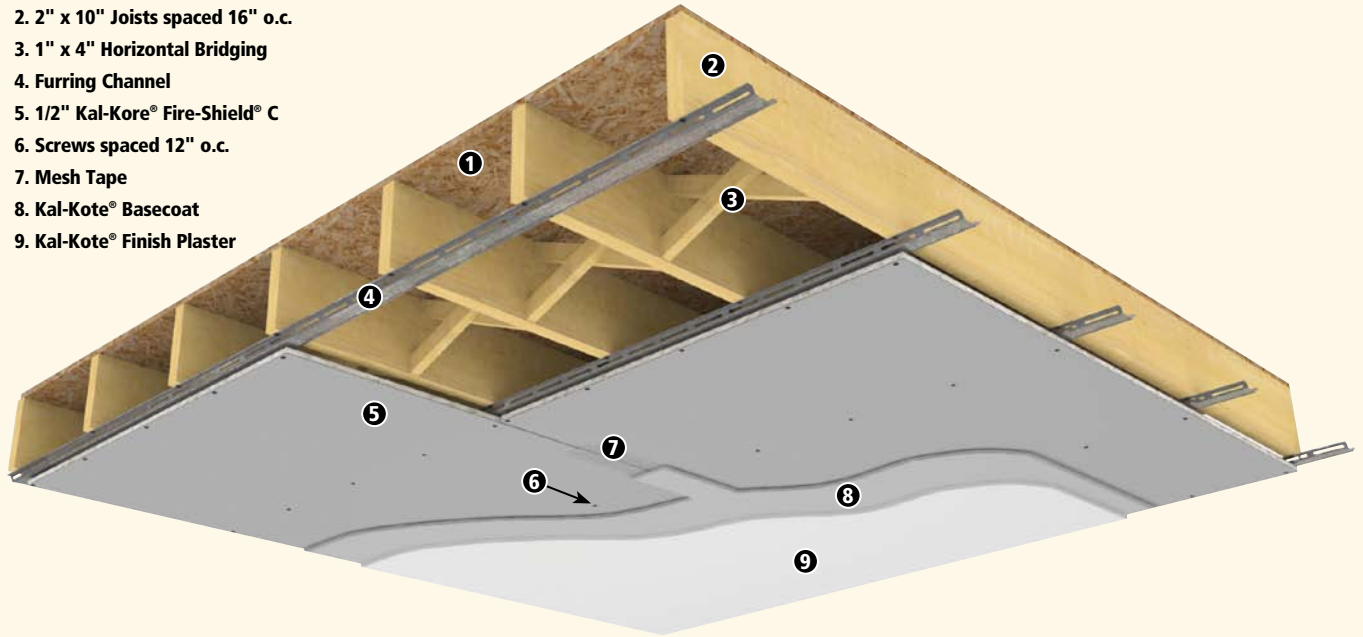
- Avoid exposure to excessive or continuous moisture and extreme temperatures. Do not use plaster base where it will be exposed to temperatures exceeding 125°F (52°C) for extended periods of time.
- Use in interior applications only. Not intended for use without application of recommended plaster finish coats and paint or other finishes.
- If required, install a vapor retarder behind plaster base. Properly ventilate or condition spaces to remove moisture buildup during plaster application.

- Do not allow weight to exceed 2.2 psf (10.7 kg/m²) when installing ceiling insulation above plaster base. Apply insulation and polyethylene vapor barrier (if used) before installation.
- Do not sand finished plaster.
- Properly ventilate or condition attic spaces to remove moisture buildup above gypsum board ceilings. If required, install a vapor retarder in exterior ceilings behind plaster base.
- Avoid installing plaster base directly over insulation blankets with facer flanges placed continuously across the face of the framing members; recess insulation blankets and attach flanges to the sides of framing.
- Isolate plaster base from contact with building structure in locations where structural movement may impose direct loads on gypsum board assemblies.
- Provide control joints spaced not more than 30 ft. (9,144 mm) where employing long continuous runs of walls, partitions or ceilings without perimeter relief.
- Avoid plaster base joints within 12 in. (305 mm) of the corners of window or door frames unless installing control joints at the door frame corners.
- All ends and edges of plaster base should occur over framing members or other solid backing except where treated joints occur at right angles to framing or furring members.
- Space supporting framing for single-layer wall application of 1/2 in. (12.7 mm) plaster base a maximum of 24 in. (610 mm) o.c. Space framing for single-layer wall application of 3/8 in. (9.5 mm) plaster base a maximum of 16 in. (406 mm) o.c.

Gold Bond® BRAND Kal-Kore® Plaster Base

KAL-KORE PLASTER BASE INSTALLATION WITH KAL-KOTE PLASTER FINISH

1. Sub-Floor
2. 2" x 10" Joists spaced 16" o.c.
3. 1" x 4" Horizontal Bridging
4. Furring Channel
5. 1/2" Kal-Kore® Fire-Shield® C
6. Screws spaced 12" o.c.
7. Mesh Tape
8. Kal-Kote® Basecoat
9. Kal-Kote® Finish Plaster



For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL** (628-4662) or visit our website: nationalgypsum.com.



Veneer Plaster and Conventional Plaster



Gold Bond®
Boards / Plaster

Whether your commercial or residential project requires a veneer or conventional plaster system, you will find the perfect match in our family of Gold Bond® BRAND products. Choose from among our outstanding options: five veneer plaster and five conventional plaster products featured in this section. Whichever system you specify, you will be pleased with the finished appearance and lasting performance of Gold Bond® Plaster Products.



Veneer Plaster Products

Gold Bond® BRAND Uni-Kal® Veneer Plaster



DESCRIPTION

Gold Bond® BRAND Uni-Kal® Smooth Finish Veneer Plaster is a mill-mixed veneer finish plaster for smooth and textured troweled applications. It consists of specially ground, calcined gypsum, requiring the addition of water. Texturing grade silica sand may be added for textured finish. Complies with ASTM C587.

APPLICATIONS

Use as a single-coat application over gypsum plaster base. A finish coat of Uni-Kal® Veneer Plaster may be used for interior smooth and textured trowel application over a gypsum plaster basecoat or as a single-coat application over gypsum plaster base.

TECHNICAL DATA

Packaging	49.5 lb. (22.5 kg) / Bag
Water Ratio	13 – 15 qts. / Bag
PSI	1,400
Approx. Coverage per Bag – Applied Thickness	135 – 150 sq. ft. (12 – 14 m ²) 3/32" (2.4 mm)
One Coat to Level Over Masonry	70 – 80 sq. ft. (6.5 – 7.5 m ²)

Gold Bond® BRAND X-KALibur® Extended Set Veneer Plaster



DESCRIPTION

Gold Bond® BRAND X-KALibur® Extended Set Veneer Plaster is a mill-mixed veneer finish plaster for smooth troweled applications where an extended setting time is desirable. It consists of specially ground, calcined gypsum, requiring the addition of water. Texturing grade silica sand may be added for textured finish. Complies with ASTM C587.

APPLICATIONS

Use as a single-coat application over gypsum plaster base. A finish coat of X-KALibur may be used for interior smooth and textured trowel application over a gypsum plaster basecoat.

TECHNICAL DATA

Packaging	49.5 lb. (22.5 kg) / Bag
Water Ratio	13 – 15 qts. / Bag
PSI	1,400
Approx. Coverage per Bag – Applied Thickness	135 – 150 sq. ft. (12 – 14 m ²) 3/32" (2.4 mm)
One Coat to Level Over Masonry	70 – 80 sq. ft. (6.5 – 7.5 m ²)

Gold Bond® BRAND Kal-Kote® Basecoat Veneer Plaster



DESCRIPTION

Gold Bond® BRAND Kal-Kote® Basecoat Plaster is a specially designed high strength basecoat plaster for application 1/16" (1.6 mm) minimum thickness over Kal-Kote® Plaster Base, masonry or monolithic concrete that has been treated with a bonding agent. Strength of Kal-Kote® Basecoat is substantially greater than that exhibited by typical sanded basecoat plaster.

APPLICATIONS

Veneer Plaster two-coat systems may be specified for virtually all types of partition and ceiling constructions, including wood or steel framing, or furring and masonry. For both residential and commercial buildings, either type of veneer plaster system produces a surface that is resistant to nail pops.

Kal-Kote Basecoat is a high strength basecoat plaster for application over Kal-Kore. This system offers four finish options: Kal-Kote® Smooth, Kal-Kote® Texture, Uni-Kal® and X-KALibur®.

TECHNICAL DATA

Packaging	49.5 lb. (22.5 kg) / Bag
Water Ratio	6 – 8 qts. / Bag
PSI	2,500
Approx. Coverage per Bag – Applied Thickness	93 – 106 sq. ft. (8.6 – 9.8 m ²) 1/16" (1.6 mm)
One Coat to Level Over Masonry	50 – 63 sq. ft. (4.6 – 5.8 m ²)

Gold Bond® BRAND Kal-Kote® Smooth Finish Plaster



DESCRIPTION

Gold Bond® BRAND Kal-Kote® Smooth Finish Plaster is a mill-mixed finish plaster for two-coat smooth-troweled applications. It consists of specially ground, calcined gypsum, requiring the addition of water. Complies with ASTM C587.

APPLICATIONS

A finish coat of Kal-Kote® Smooth Finish Plaster is intended for interior smooth trowel application over a gypsum plaster basecoat.

Apply smooth finish plasters at a thickness of not more than 1/16 in. (1.6 mm).

TECHNICAL DATA

Packaging	49.5 lb. (22.5 kg) / Bag
Water Ratio	18 – 20 qts. / Bag
PSI	1,000
Approx. Coverage per Bag – Applied Thickness	145 – 160 sq. ft. (13 – 15 m ²) 1/16" (1.6 mm)

Veneer Plaster Products

Gold Bond® BRAND Kal-Kote® Texture Finish Plaster



DESCRIPTION

Gold Bond® BRAND Kal-Kote® Texture Finish Plaster is a mill-mixed finish plaster for textured applications. It consists of specially ground, calcined gypsum and aggregate, requiring the addition of water. Complies with ASTM C587.

APPLICATIONS

A finish coat of Kal-Kote® Texture Finish Plaster is intended for interior textured application over a gypsum plaster basecoat in a two-coat system.

Apply finish plasters at a thickness of not more than 1/16 in. (1.6 mm).

TECHNICAL DATA

Bag Weight	49.5 lb. (22.5 kg) / Bag
Water Ratio	11 – 12 qts. / Bag
PSI	1,000
Approx. Coverage per Bag – Applied Thickness	145 – 160 sq. ft. (13 – 15 m ²) 1/16" (1.6 mm)

Conventional Plaster Products

Gold Bond® BRAND Two-Way Hardwall Plaster



TECHNICAL DATA	
Packaging	49.5 lb. (22.5 kg) / Bag
Gypsum Plaster Base Applications	
– Approx. Coverage per Bag	40 – 50 sq. ft. (3.7 – 4.6 m ²)
– Applied Thickness	7/16" (11.1 mm)
– Aggregate Proportion	Sanded 1:2-1/2
Metal Lath Applications	
– Approx. Coverage per Bag	20 – 26 sq. ft. (1.9 – 2.4 m ²)
– Applied Thickness	9/16" (14.3 mm)
– Aggregate Proportion	Sanded 1:2-1/2
Brick, Clay Tile, Concrete Block Applications	
– Approx. Coverage per Bag	40 – 50 sq. ft. (3.7 – 4.6 m ²)
– Applied Thickness	9/16" (14.3 mm)
– Aggregate Proportion	Sanded 1:3

*Measured from face of lath.

NOTE: Sanded 1:2-1/2 means 1 part plaster to 2-1/2 parts sand by weight.

PHYSICAL PROPERTIES			
Mix		Compressive Strength ASTM C472	Tensile Strength ASTM C472
Vermiculite Mix			
– Metal Lath and Gypsum Plaster Base (ASTM C516)	2 ft. ³ / 100 lb. (.06 m ³ / 45.4 kg)	500 lbf / sq. in. (3,445 kPa)	130 lbf / sq. in. (896 kPa)
– Masonry (ASTM C516)	3 ft. ³ / 100 lb. (.08 m ³ / 45.4 kg)	300 lbf / sq. in. (2,067 kPa)	90 lbf / sq. in. (620 kPa)
Perlite Mix			
– Metal Lath and Gypsum Plaster Base (ASTM C549)	2 cu. ft. / 100 lb. (.06 m ³ / 45.4 kg)	900 lbf / sq. in. (6,201 kPa)	160 lbf / sq. in. (1,102 kPa)
– Masonry (ASTM C549)	3 cu. ft. / 100 lb. (.08 m ³ / 45.4 kg)	650 lbf / sq. in. (4,479 kPa)	100 lbf / sq. in. (698 kPa)
Sand Mix			
	1:1	1,600 lbf / sq. in. (11,024 kPa)	250 lbf / sq. in. (1,722 kPa)
	1:2	1,150 lbf / sq. in. (7,923 kPa)	190 lbf / sq. in. (1,309 kPa)
	1:3	750 lbf / sq. in. (5,168 kPa)	120 lbf / sq. in. (827 kPa)

DESCRIPTION

Gold Bond® BRAND Two-Way Hardwall Plaster is a basecoat gypsum neat plaster that requires the jobsite addition of an aggregate and water. When properly proportioned with aggregate, Two-Way Hardwall Plaster forms a hard, durable base for gypsum plaster finish coats. Complies with ASTM C28.

Use Two-Way Hardwall Plaster with sand or expanded lightweight aggregate conforming to ASTM C35. It is mechanically mixed at the jobsite. Apply it by hand or use it through pump/spray plastering machines.

Two-Way Hardwall Plaster consists of unaggregated gypsum plaster, and contains no asbestos.

APPLICATIONS

Two-Way Hardwall Plaster is designed for interior use over all accepted plaster bases as described in ASTM C842.

Two-Way Hardwall Plaster is intended to serve as a basecoat plaster for finish plasters, such as:

- Gold Bond® BRAND Gypsum Gauging Plaster
- Gold Bond® BRAND Kal-Kote® Smooth Finish
- Gold Bond® BRAND Kal-Kote® Texture Finish
- Gold Bond® BRAND Uni-Kal®
- Gold Bond® BRAND X-KALibur®

ADVANTAGES

Controlled Uniformity: Two-Way Hardwall Plaster is set-stabilized and adjusted for market requirements and seasonal changes. When mixed with sand or other aggregates, it has uniform working qualities and excellent spread.

Strength: Two-Way Hardwall Plaster properly proportioned with aggregate forms a hard, durable base for the finish coat that provides increased resistance to minor structural movements, impacts and abrasions.

Fire Resistant: Two-Way Hardwall Plaster is essentially mineral in composition and will not support combustion.

RECOMMENDATIONS

Use sand mix plaster for general application and compressive strength.

Use vermiculite plaster for additional fire resistance.

Use perlite mix plaster for lightweight and fire resistance, including columns and beams.

Conventional Plaster Products

Gold Bond® BRAND Gypsolite® Plaster



TECHNICAL DATA

Packaging	49.5 lb. (22.5 kg) / Bag
Gypsum Lath Applications	
– Approx. Coverage per Bag	32 – 35 sq. ft. (3.0 – 3.5 m ²)
– Applied Thickness	7/16" (11.1 mm)
Metal Lath Applications	
– Approx. Coverage per Bag	16 – 19 sq. ft. (1.5 – 1.8 m ²)
– Applied Thickness	9/16" (14.3 mm)*

*Measured from face of lath.

PHYSICAL PROPERTIES

	Compressive Strength ASTM C472	Tensile Strength ASTM C472
Mill Mix	900 lbf / sq. in. (6,201 kPa)	160 lbf / sq. in. (1,102 kPa)

MORTAR THICKNESS/WEIGHT

3/8" (9.5 mm)	14 lb. / sq. yd. (8 kg / m ²)
1/2" (12.7 mm)	19 lb. / sq. yd. (10 kg / m ²)
5/8" (15.9 mm)	24 lb. / sq. yd. (13 kg / m ²)
3/4" (19.1 mm)	29 lb. / sq. yd. (16 kg / m ²)

MORTAR WEIGHT

Dryset Mortar	50 lb. / cu. ft. (801 kg / m ³)
Wet Mortar	69 lb. / cu. ft. (1,105 kg / m ³)

DESCRIPTION

Gold Bond® BRAND Gypsolite® Plaster is a lightweight gypsum basecoat plaster mixed at the plant with correctly sized and proportioned perlite aggregate, requiring only the addition of water on the job. Gypsolite® Plaster meets ASTM C28.

Gypsolite Plaster contains no asbestos.

APPLICATIONS

Gypsolite Plaster is designed for interior use in trowel application over gypsum or metal lath as described in ASTM C842.

Gypsolite Plaster is intended to serve as a basecoat plaster for finish plasters, such as:

- Gold Bond® BRAND Gypsum Gauging Plaster
- Gold Bond® BRAND Kal-Kote® Smooth Finish
- Gold Bond® BRAND Kal-Kote® Texture Finish
- Gold Bond® BRAND Uni-Kal®
- Gold Bond® BRAND X-KALibur®

ADVANTAGES

Controlled Uniformity: Gypsolite Plaster assures uniformity through exact proportioning and thorough mixing of graded perlite and gypsum plaster at the mill. Gypsolite provides a uniform base for the finish coat.

Lightweight: Gypsolite Plaster weighs less than half as much as sanded gypsum plaster, thus reducing the dead-load on framing as well as jobsite handling costs.

High Insulating Value: With a "k" factor of 1.5, Gypsolite provides about 3-1/2 times the insulating value of sanded plaster.

Fire Resistant: Gypsolite has excellent fire-resistive qualities and generally provides fire ratings higher than sanded plaster.

LIMITATIONS

Do not use smooth-trowel finish over metal lath, as the combination of a relatively soft (perlite aggregated) basecoat and a hard (smooth-trowel lime/gauging) finish has the potential for cracking and spalling of the finish coat. Instead, specify a sand float finish.

Gold Bond® BRAND Super-White Gauging Plaster



TECHNICAL DATA	
Packaging	49.5 lb. (22.5 kg) / Bag
Approx. Coverage*	225 – 315 sq. ft. / Bag (21 – 29 m ² / Bag)

*Based on 1 part plaster to 2 parts hydrated lime.

DESCRIPTION

Gold Bond® BRAND Super-White Gauging Plaster, quick set type or slow set type, is intended for jobsite mixing with hydrated lime. It consists of specially ground, calcined gypsum, which readily mixes with water and hydrated lime.

Proper proportioning is essential, since gauging adds strength and hardness to the finish surface by reinforcing the plastic non-setting lime against shrinkage and cracking.

APPLICATIONS

A finish coat of gypsum gauging plaster and hydrated lime, job mixed 2 parts hydrated lime to 1 part plaster by weight, is intended primarily for interior smooth trowel application over a gypsum plaster basecoat.

Apply smooth finish plasters at a thickness of not more than 1/16 in. (1.6 mm). Texture finishes should be applied at a thickness of not more than 1/8 in. (3.2 mm).

LIMITATIONS

Do not use a smooth-trowel finish over metal lath, as the combination of a relatively soft (perlite aggregated) basecoat and a hard (smooth-trowel lime/gauging) finish has the potential for cracking and spalling of the finish coat. Instead, specify a sand float finish.

Gold Bond®
Boards / Plaster

Gold Bond® BRAND Super-White Moulding Plaster



DESCRIPTION

Gold Bond® BRAND Super-White Moulding Plaster is a very white, finely ground gypsum, primarily used for all kinds of ornamental plaster work. Because of its low expansion, excellent strength and hardness, it is specially adaptable for casting in rubber, gelatin and other types of moulds. For casting purposes, only water is added. For run-in-place ornamental work, such as cornices, the moulding plaster is used with lime putty, mixed 2 parts lime to 1 part moulding plaster by weight. Complies with ASTM C59.

TECHNICAL DATA	
Packaging	49.5 lb. (22.5 kg) / Bag
Water Ratio*	15-18 qts. / Bag

*For casting purposes.

Gold Bond® BRAND Conventional Plaster Products

Gold Bond® BRAND Plaster Accelerator



DESCRIPTION

Gold Bond® BRAND Plaster Accelerator provides minor adjustments to the set time for conventional and veneer plaster systems. Adding a plaster accelerator to the mix causes gypsum crystals to form at a much quicker rate, shortening set times.

TECHNICAL DATA

Packaging	1.5 lb. (0.7 kg) / Tub
------------------	------------------------

Gold Bond® BRAND Plaster Retarder



DESCRIPTION

Use Gold Bond® BRAND Plaster Retarder for minor to moderate lengthening of set times for plaster products. Gold Bond® Plaster Retarder slows the setting time of gypsum plasters. Due to jobsite conditions, the plastering contractor may need to alter the setting time to allow for suitable application and finishing.

TECHNICAL DATA

Packaging	1.67 lb. (0.8 kg) / Tub
------------------	-------------------------



XP® Gypsum Board

Regular, Fire-Shield® Type X and Fire-Shield® Type C

PURPLE 
EVOLVE YOUR WALLS™

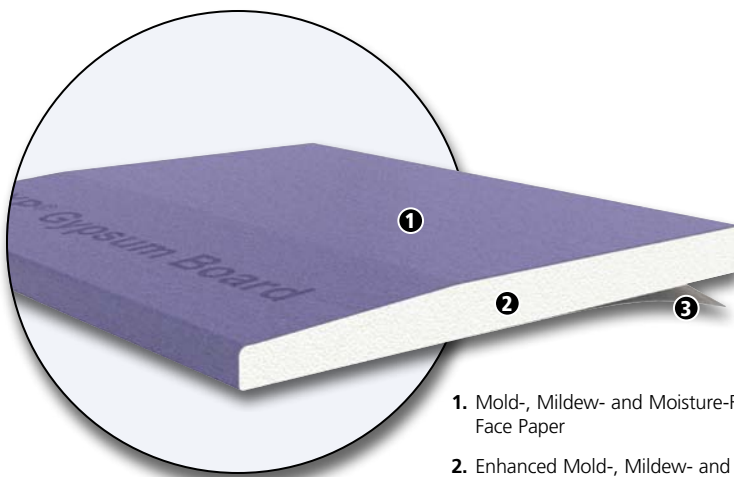
Gold Bond® BRAND XP® Gypsum Board consists of a mold-, mildew-, moisture- and fire-resistant gypsum core with a specially designed PURPLE® paper. The PURPLE face paper is heavy, 100-percent recycled and offers superior mold, mildew and moisture resistance. The 100-percent recycled gray back paper is also mold-, mildew- and moisture-resistant.

Use it on walls and ceilings where framing members are spaced up to 24 in. (610 mm). It is available with either a Regular, Fire-Shield® Type X or Fire-Shield® Type C gypsum core.

For speed of installation, GridMarX® guide marks are printed on the paper surface.

Sizes: 1/2 in. (12.7 mm) thick Regular and Type C Boards and 5/8 in. (15.9 mm) thick Type X or Type C Boards are available in 4 ft. (1,219 mm) widths and 8 ft. (2,438 mm) to 12 ft. (3,658 mm) lengths.

Finishing: Tapered or square edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set™ Setting Compounds. For optimum mold performance, use ProForm® BRAND XP® All Purpose or ProForm® BRAND XP® Lite Joint Compound.



1. Mold-, Mildew- and Moisture-Resistant Face Paper
2. Enhanced Mold-, Mildew- and Moisture-Resistant Core
3. Heavy Mold-, Mildew- and Moisture-Resistant Back Paper



National 
Gypsum®

Basic Uses

APPLICATIONS

- Use it on both wood- and steel-framed construction for interior wall and ceiling applications.
- Use it as a tile backerboard in dry areas or areas with limited moisture, such as toilet or sink areas, and wall and ceiling areas above tile in tubs and showers.
- 1/2 in. (12.7 mm) XP® Fire-Shield® Type C, 5/8 in. (15.9 mm) XP® Fire-Shield® Type X, and 5/8 in. (15.9 mm) XP® Fire-Shield® Type C have specially formulated cores designed for use in specific fire-rated assemblies.

ADVANTAGES

- Suitable for all interior applications, including walls and ceilings. Also use it as a tile backerboard in dry areas and in areas with limited moisture.
- Resists the growth of mold per ASTM D3273 with a score of 10, the best possible score.
- Resists the growth of mold per ASTM G21 with a score of 0, the best possible score.
- Fire-resistant material with a gypsum core that will not support combustion or transmit temperatures greatly in excess of 212°F (100°C) until completely calcined, a slow process.
- Easily scored and snapped to exact size without sawing.
- Dimensionally stable product with negligible expansion and contraction under normal atmospheric conditions.
- Features GridMarX® guide marks on the board to allow for faster and more accurate installation.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Installation Recommendations

GENERAL

- Install gypsum board in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.
- GridMarX provides quick identification and uniform nail/screw patterns. Use GridMarX to make accurate cuts without drawing lines. GridMarX guide marks run the length of the board at five points in 4 in. (102 mm) increments. Marks run along the edge in both tapers and at 16 in. (406 mm), 24 in. (610 mm) and 32 in. (813 mm) in the field of the board. The marks cover easily with no bleed-through using standard paint products.
- Apply gypsum board first to ceilings at right angles to framing members, then to walls. Use boards of maximum practical length so that the minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.
- Install batt or blanket ceiling insulation BEFORE the gypsum board on ceilings when installing a vapor retarder behind the gypsum board. Install the insulation IMMEDIATELY after the gypsum board when using loose fill insulation. Avoid installation practices that might allow condensation to form behind boards.
- Cut gypsum board to allow for a minimum 1/4 in. (6.4 mm) gap between gypsum board and floor to prevent potential wicking of moisture.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Locate gypsum board joints at openings so that no joint will align within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.

TECHNICAL DATA

PHYSICAL PROPERTIES				
	XP Gypsum Board	1/2" XP Fire-Shield C Gypsum Board	5/8" XP Fire-Shield Gypsum Board	5/8" XP Fire-Shield C Gypsum Board
Thickness¹, Nominal	1/2" (12.7 mm)	1/2" (12.7 mm)	5/8" (15.9 mm)	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm)	4' (1,219 mm)	4' (1,219 mm)	4' (1,219 mm)
Length^{1,4}, Standard	8' – 12' (2,438 mm – 3,658 mm)	8' – 12' (2,438 mm – 3,658 mm)	8' – 12' (2,438 mm – 3,658 mm)	8' – 12' (2,438 mm – 3,658 mm)
Weight, Nominal	1.5 – 1.6 lbs. / sq. ft. (7.32 – 7.81 k/m ²)	1.9 lbs. / sq. ft. (9.28 k/m ²)	2.2 lbs. / sq. ft. (10.74 k/m ²)	2.3 lbs. / sq. ft. (11.23 k/m ²)
Edges¹	Square or Tapered	Square or Tapered	Square or Tapered	Square or Tapered
Flexural Strength¹, Perpendicular	≥ 107 lbf. (476 N)	≥ 107 lbf. (476 N)	≥ 147 lbf. (654 N)	≥ 147 lbf. (654 N)
Flexural Strength¹, Parallel	≥ 36 lbf. (160 N)	≥ 36 lbf. (160 N)	≥ 46 lbf. (205 N)	≥ 46 lbf. (205 N)
Humidified Deflection¹	≤ 10/8" (31.8 mm)	≤ 10/8" (31.8 mm)	≤ 5/8" (15.9 mm)	≤ 5/8" (15.9 mm)
Nail Pull Resistance¹	≥ 77 lbf. (343 N)	≥ 77 lbf. (343 N)	≥ 87 lbf. (387 N)	≥ 87 lbf. (387 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)
Bending Radius	10' (3,048 mm)	10' (3,048 mm)	15' (4,572 mm)	15' (4,572 mm)
Thermal Resistance⁵	R = .45	R = .45	R = .56	R = .56
Permeance⁶	37 perms	37 perms	37 perms	37 perms
Water Absorption¹ (% of Weight)	< 5%	< 5%	< 5%	< 5%
Mold Resistance⁷, ASTM D3273	Score of 10	Score of 10	Score of 10	Score of 10
Mold Resistance⁸, ASTM G21	Score of 0	Score of 0	Score of 0	Score of 0
Product Standard Compliance	ASTM C1396	ASTM C1396	ASTM C1396	ASTM C1396
Fire-Resistance Characteristics				
Core Type	Regular	Type C	Type X	Type C
UL Type Designation	N/A	FSMR-C	FSW	FSW-C
Combustibility²	Non-combustible Core	Non-combustible Core	Non-combustible Core	Non-combustible Core
Surface Burning Characteristics³	Class A	Class A	Class A	Class A
Flame Spread³	15	15	15	15
Smoke Development³	0	0	0	0
Applicable Standards and References				
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products				
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus				
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board				
ASTM C1396 Standard Specification for Gypsum Board				
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber				
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials				
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials				
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C				
ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi				
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>				
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>				
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>				
National Gypsum Company, <i>NGC Construction Guide</i>				

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

6. Tested in accordance with ASTM E96.

7. Tested in accordance with ASTM D3273.

8. Tested in accordance with ASTM G21.

- Hold gypsum board in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the face paper of the gypsum board. Remove improperly driven nails or screws.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach gypsum board and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.
- Double nailing is an alternate method of attachment devised to minimize nail pops. This system requires doubling up on the field nails. The total quantity of nails used does not double, however, since maximum nail spacing is increased to 12 in. (305 mm) o.c. and conventional nailing is used on the perimeter. Application is accomplished by first single nailing the field of the board, starting at the center and working toward ends and edges. Another nail is then driven in close proximity (2 in. [50.8 mm] to 2-1/2 in. [63.6 mm]) to each of the first nails. The first series of nails are then struck again to ensure the board is drawn tightly to the framing member.
- When using adhesive to attach gypsum board, apply drywall adhesive to the face of studs or joists in continuous beads. Reference ASTM C840 Section 10.

FINISHING

Joints between XP® Gypsum Board may be finished with either paper tape and ready mix joint compound or fiberglass mesh or paper tape and setting compound, such as ProForm® BRAND Interior Finishing Products.

DECORATION

Ensure gypsum board surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

Prepare and prime gypsum boards prior to texturing.

Refer to GA-214 to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

CRITICAL LIGHTING AREAS

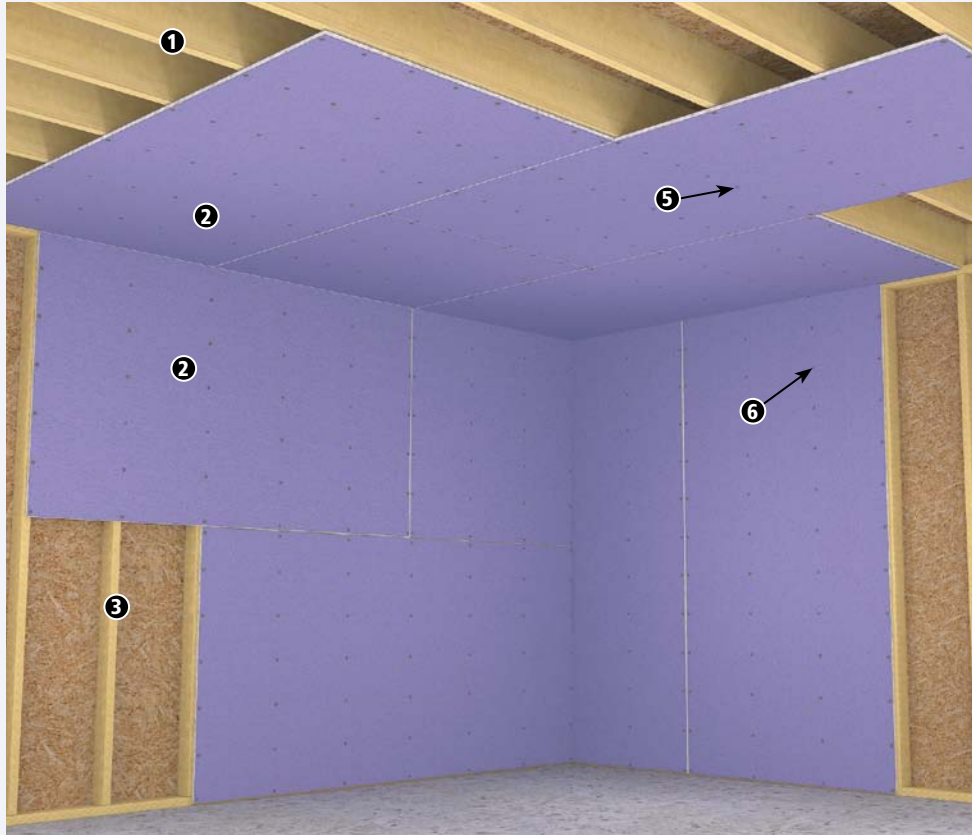
Wall and ceiling areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paints and dark-toned paint finishes highlight surface defects; consider using textures to hide these minor visual imperfections. Finish boards to a Level 5 finish, as outlined in GA-214.

Limitations

- Avoid exposure to excessive or continuous moisture and extreme temperatures. Do not expose gypsum board to temperatures exceeding 125°F (52°C) for extended periods of time.
- Properly ventilate or condition attic spaces to remove moisture buildup above gypsum board ceilings. If required, install a vapor retarder in exterior ceilings behind gypsum board.
- Avoid installing gypsum board directly over insulation blankets with facer flanges placed continuously across the face of the framing members; recess insulation blankets and attach flanges to the sides of framing.
- Isolate gypsum board from contact with building structure in locations where structural movement may impose direct loads on gypsum board assemblies.
- Provide control joints spaced not more than 30 ft. (9,144 mm) where employing long continuous runs of walls, partitions or ceilings without perimeter relief.
- Avoid gypsum board joints within 12 in. (305 mm) of the corners of window or door frames unless installing control joints at these locations.
- In single-ply installation, all ends and edges of gypsum board should occur over framing members or other solid backing except where treated joints occur at right angles to framing or furring members.
- Apply 1/2 in. (12.7 mm) gypsum board ceilings to be decorated with water-based spray texture perpendicular to the framing spaced a maximum of 16 in. (406 mm) o.c.
- Space supporting framing for single-layer application of 1/2 in. (12.7 mm) gypsum board a maximum of 24 in. (610 mm) o.c.
- Do not use boards as a nailing base as they are nonstructural.
- Avoid using in areas subject to constant and/or excessive moisture and high humidity, such as gang showers, saunas, steam rooms or swimming pool enclosures.
- Avoid using as a backer board directly behind tile in tub and shower areas.
- Do not install in pre-rock conditions.
- Do not finish joints until building is properly closed in and conditioned.

Gold Bond® BRAND XP® Gypsum Board

STANDARD APPLICATION WITH NAILS – SINGLE LAYER



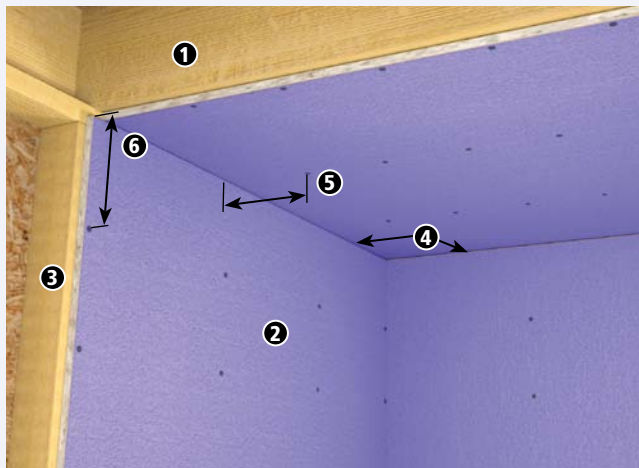
Installation Notes

**1/2" (12.7 mm) and
5/8" (15.9 mm) XP® Gypsum Board**

- 24" o.c. maximum framing spacing
 - Ceiling application (perpendicular)
 - Wall application (perpendicular or parallel)
- 16" o.c. framing spacing
 - Ceiling application (perpendicular or parallel)
 - Wall application (perpendicular or parallel)
- Minimum gypsum board nail length 1-3/8"

XP® Boards

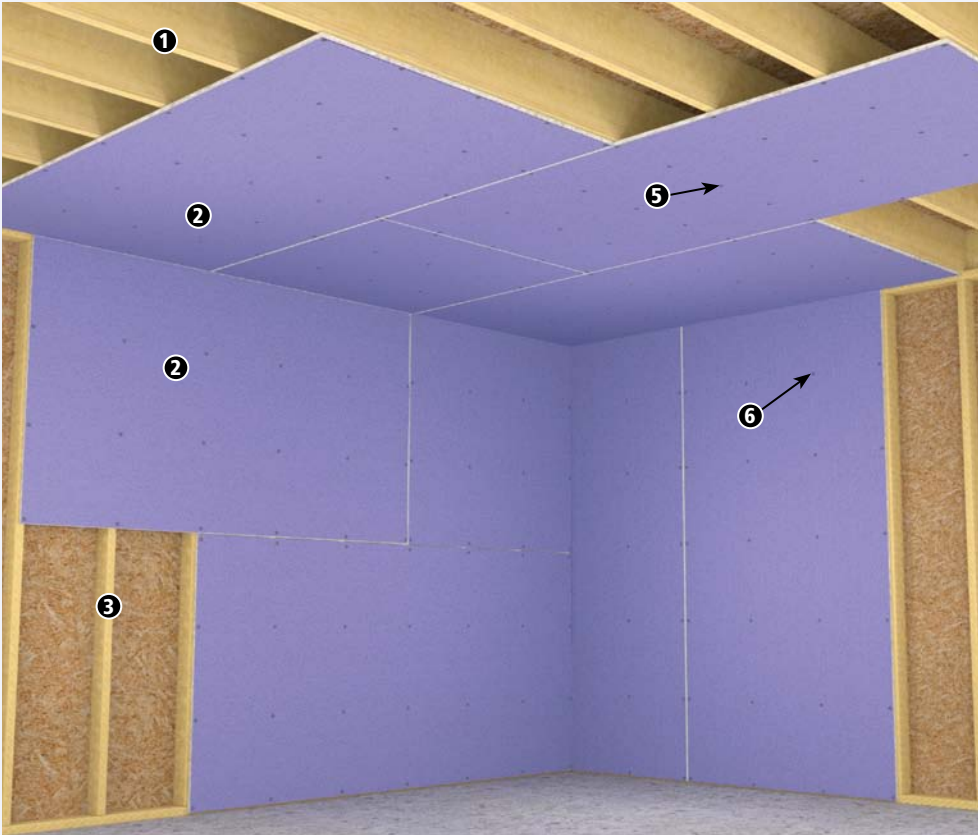
FLOATING CEILING CORNER – NAIL INSTALLATION



System Components

1. Ceiling Joist Framing
2. Gypsum Board
3. Wall Framing
4. Floating Interior Angles
5. Ceiling: 7" o.c.
6. Wall: 8" o.c.

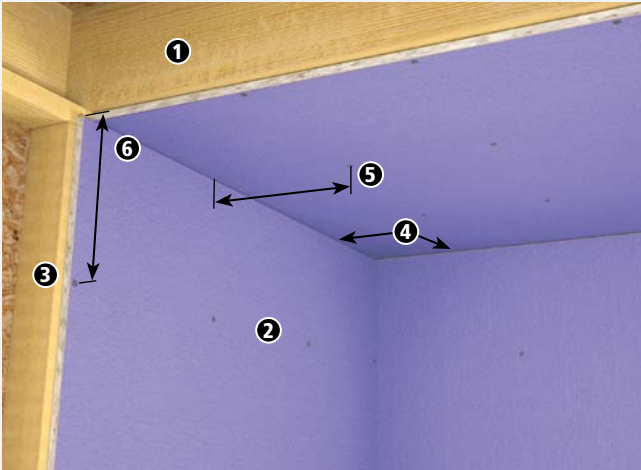
STANDARD APPLICATION WITH SCREWS – SINGLE LAYER



Installation Notes
1/2" (12.7 mm) and 5/8" (15.9 mm) XP® Gypsum Board

- 24" o.c. maximum framing spacing
 - Ceiling application (perpendicular)
 - Wall application (perpendicular or parallel)
 - Screw spacing not to exceed 12" o.c.
- 16" o.c. framing spacing
 - Ceiling application (perpendicular or parallel)
 - Wall application (perpendicular or parallel)
- Minimum gypsum board screw length 1-1/8"

FLOATING CEILING CORNER – SCREW INSTALLATION



System Components

1. Ceiling Joist Framing
2. Gypsum Board
3. Wall Framing
4. Floating Interior Angles
5. Ceiling: 12" o.c.
6. Wall: 16" o.c.
Floating Ceiling: 12" o.c.

XP® Boards

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.

5/16" XP® Fire-Shield®

Gypsum Board

PURPLE 
EVOLVE YOUR WALLS™

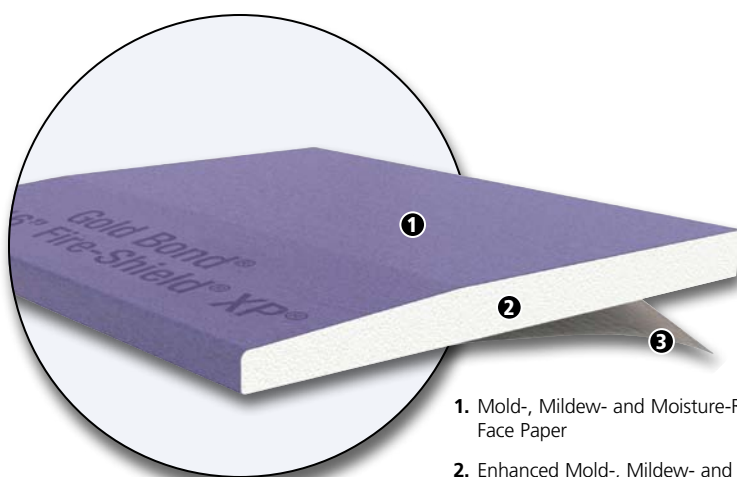
Gold Bond® BRAND 5/16" XP® Fire-Shield® Gypsum Board consists of a mold-, mildew-, moisture- and fire-resistant gypsum core with a specially designed PURPLE® paper.

The PURPLE face paper is a heavy paper that is 100-percent recycled and offers superior mold, mildew and moisture resistance. The 100-percent recycled gray back paper is also mold-, mildew- and moisture-resistant.

Use it for constructing concave and convex corners in multi-layered applications requiring a fire-rated assembly.

Sizes: 5/16 in. (7.9 mm) thick boards are available in 4 ft. (1,219 mm) widths and standard lengths of 8 ft. (2,438 mm), 10 ft. (3,048 mm) and 12 ft. (3,658 mm).

Finishing: Tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set® Setting Compounds. For optimum mold performance, use ProForm® BRAND XP® All Purpose or ProForm® BRAND XP® Lite Joint Compounds.



1. Mold-, Mildew- and Moisture-Resistant Face Paper
2. Enhanced Mold-, Mildew- and Moisture-Resistant Core
3. Heavy Mold-, Mildew- and Moisture-Resistant Back Paper



National 
Gypsum®

Basic Uses

APPLICATIONS

- Use in constructing concave and convex corners in multi-layered applications requiring a fire-rated assembly.

ADVANTAGES

- Use it in both wood- and metal-framed construction for curved walls providing enhanced moisture and mold resistance.
- 1- and 2-hour fire ratings available.
- Resists the growth of mold per ASTM D3273 with a score of 10, the best possible score.
- Resists the growth of mold per ASTM G21 with a score of 0, the best possible score.
- Easily scored and snapped to exact size without sawing.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Installation Recommendations

GENERAL

- Install gypsum boards in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.
- Use boards of maximum practical length so that the minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.
- Locate gypsum board joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Hold gypsum board in firm contact with the framing member while fasteners are being driven. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the facer of the gypsum board. Remove improperly driven nails or screws.
- Cut gypsum board to allow for a minimum 1/4 in. (6.4 mm) gap between gypsum board and floor to prevent potential wicking of moisture.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the gypsum boards and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.
- Install fire-rated assemblies in accordance with the details found in the *UL Fire Resistance Directory* or Gypsum Association *GA-600 Fire Resistance Design Manual*.
- Drive fasteners just below the surface, avoiding damage to the core and/or facer.

TECHNICAL DATA

PHYSICAL PROPERTIES	
5/16" XP Fire-Shield Gypsum Board	
Thickness¹, Nominal	5/16" (7.9 mm)
Width¹, Nominal	4' (1,219 mm)
Length¹, Standard	8' (2,438 mm), 10' (3,048 mm), 12' (3,658 mm)
Weight, Nominal	1.3 – 1.4 lbs. / sq. ft. (6.35 – 6.84 k/m ²)
Edges¹	Tapered
Flexural Strength¹, Perpendicular	≥ 62 lbf. (276 N)
Flexural Strength¹, Parallel	≥ 21 lbf. (93 N)
Humidified Deflection¹	N/A
Nail Pull Resistance¹	≥ 46 lbf. (205 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)
Bending Radius	2' (610 mm)
Thermal Resistance⁴	N/A
Permeance⁵	22 perms
Water Absorption¹ (% of Weight)	< 5%
Mold Resistance⁶, ASTM D3273	Score of 10
Mold Resistance⁷, ASTM G21	Score of 0
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	N/A
UL Type Designation	FSW
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	15
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi	
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>	
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>	
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Tested in accordance with ASTM C518.

5. Tested in accordance with ASTM E96.

6. Tested in accordance with ASTM D3273.

7. Tested in accordance with ASTM G21.

Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

FINISHING

Perform finishing of 5/16" XP® Fire-Shield® Gypsum Board in accordance with GA-214. Joints between boards may be finished with either paper tape and ready mix joint compound or fiberglass mesh or paper tape and setting compound, such as ProForm® BRAND Interior Finishing Products.

DECORATION

Ensure gypsum board surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

Prepare and prime gypsum boards prior to decoration.

Refer to GA-214 to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

CRITICAL LIGHTING AREAS

Wall areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paints and dark-toned paint finishes highlight surface defects; consider using textures to hide these minor visual imperfections. Finish boards to a Level 5 finish, as outlined in GA-214.

Limitations

- Do not use for exterior applications. 5/16" XP Fire-Shield Gypsum Board is intended for interior use only.
- Do not use boards as a nailing base as they are nonstructural.
- Avoid exposure to excessive or continuous moisture and extreme temperatures. Do not expose gypsum boards to temperatures exceeding 125°F (52°C) for extended periods of time.
- Avoid using in areas subject to constant and/or excessive moisture and high humidity, such as gang showers, saunas, steam rooms or swimming pool enclosures.
- Avoid using as a backer board directly behind tile in tub and shower areas.
- Do not install in pre-rock conditions.
- Do not finish joints until building is properly closed in and conditioned.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



Hi-Abuse® XP®

Gypsum Board

PURPLE 
EVOLVE YOUR WALLS™

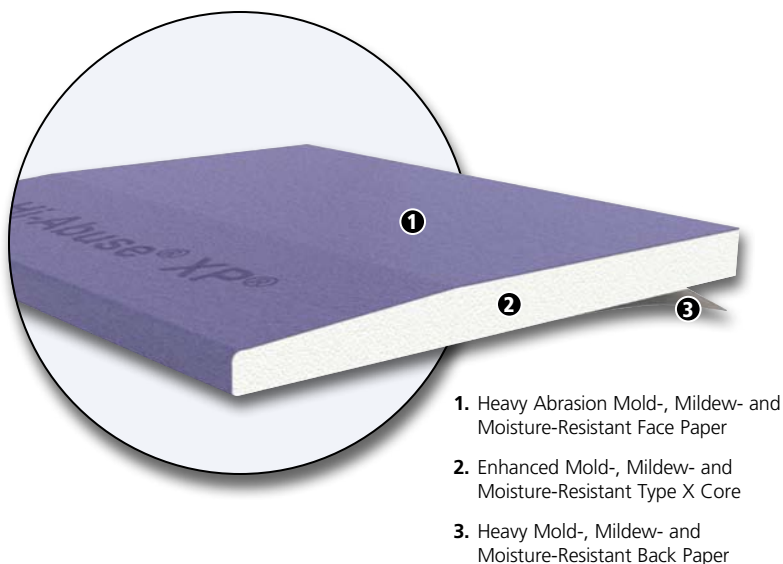
Gold Bond® BRAND Hi-Abuse® XP® Gypsum Board consists of a mold-, mildew-, moisture- and fire-resistant Type X gypsum core with a specially designed PURPLE® paper. The PURPLE face paper is heavy and offers superior abrasion, mold, mildew and moisture resistance. The 100-percent recycled gray back paper is also mold-, mildew- and moisture-resistant.

Use it for interior wall and ceiling applications.

For speed of installation, GridMarX® guide marks are printed on the paper surface.

Sizes: 5/8 in. (15.9 mm) thick boards are available in 4 ft. (1,219 mm) widths and in standard lengths of 8 ft. (2,438 mm) to 12 ft. (3,658 mm).

Finishing: Tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set™ Setting Compounds. For optimum mold performance, use ProForm® BRAND XP® All Purpose Joint Compound or ProForm® BRAND XP® Lite Joint Compound.



National 
Gypsum®

Note: For abuse and impact test (ASTM C1629) results, see page 388.

Basic Uses

APPLICATIONS

- Use it for interior wall and ceiling assemblies in areas where surface abrasion, indentation and mold, mildew and moisture resistance are major concerns.
- Use 5/8 in. (15.9 mm) Hi-Abuse® XP® Gypsum Board where Type X Gypsum Board is specified in certain fire-rated wall assemblies.
- Use as a tile backer board in dry areas or areas with limited moisture, such as toilet and sink areas and wall and ceiling areas above tile in tubs and showers.

ADVANTAGES

- Provides greater resistance to surface abuse and indentation over standard gypsum board.
- Provides more protection against surface abrasion – stands up to scrapes, scratches and scuffs.
- Resists the growth of mold in accordance with ASTM D3273 with a score of 10, the best possible score.
- Resists the growth of mold in accordance with ASTM G21 with a score of 0, the best possible score.
- Fire-resistant material with a gypsum core that will not support combustion or transmit temperatures greatly in excess of 212°F (100°C) until completely calcined, a slow process.
- Easily scored and snapped to exact size without sawing.
- Dimensionally stable product with negligible expansion and contraction under normal atmospheric conditions.
- Features GridMarX® guide marks on the board to allow for faster and more accurate installation.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Installation Recommendations

GENERAL

- Install gypsum board in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.
- GridMarX provides quick identification and uniform nail/screw patterns. Use GridMarX to make accurate cuts without drawing lines. GridMarX guide marks run the length of the board at five points in 4 in. (102 mm) increments. Marks run along the edge in both tapers and at 16 in. (406 mm), 24 in. (610 mm) and 32 in. (813 mm) in the field of the board. The marks cover easily with no bleed-through using standard paint products.
- Apply gypsum board first to ceilings at right angles to framing members, then to walls. Use boards of maximum practical length so that the minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.
- Install batt or blanket ceiling insulation BEFORE the gypsum board on ceilings when installing a vapor retarder behind the gypsum board. Install the insulation IMMEDIATELY after the gypsum board when using loose fill insulation. Avoid installation practices that might allow condensation to form behind boards.
- Cut gypsum board to allow for a minimum 1/4 in. (6.4 mm) gap between gypsum board and floor to prevent potential wicking of moisture.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Locate gypsum board joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.

TECHNICAL DATA

PHYSICAL PROPERTIES	
	Hi-Abuse XP Gypsum Board
Thickness¹, Nominal	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm)
Length^{1,4}, Standard	8' – 12' (2,438 mm – 3,658 mm)
Weight, Nominal	2.8 lbs. / sq. ft. (13.67 k/m ²)
Edges¹	Tapered
Flexural Strength¹, Perpendicular	≥ 147 lbf. (654 N)
Flexural Strength¹, Parallel	≥ 46 lbf. (205 N)
Humidified Deflection¹	≤ 5/8" (15.9 mm)
Nail Pull Resistance¹	≥ 87 lbf. (387 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)
Bending Radius	15' (4,572 mm)
Thermal Resistance⁵	R = .56
Permeance⁶	37 perms
Water Absorption¹ (% of Weight)	< 5%
Mold Resistance⁷, ASTM D3273	Score of 10
Mold Resistance⁸, ASTM G21	Score of 0
Surface Abrasion⁹	Level 3
Indentation⁹	Level 1
Soft-Body Impact⁹	Level 2
Hard-Body Impact⁹	Level 1
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	Type X
UL Type Designation	FSW
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	15
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM C1629 Standard Classification for Abuse Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels	
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi	
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>	
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>	
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths.

Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

6. Tested in accordance with ASTM E96.

7. Tested in accordance with ASTM D3273.

8. Tested in accordance with ASTM G21.

9. Tested in accordance with ASTM methods in ASTM C1629 – D4977 (Surface Abrasion),

D5420 (Indentation), E695 (Soft-Body Impact), Annex A1 (Hard-Body Impact).

Refer to page 388.

- Hold gypsum board in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the face paper of the gypsum board. Remove improperly driven nails or screws.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach gypsum board and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.

FINISHING

Joints between Hi-Abuse® XP® Gypsum Board may be finished with either paper tape and ready mix joint compound or fiberglass mesh or paper tape and setting compound, such as ProForm® BRAND Interior Finishing Products.

DECORATION

Ensure gypsum board surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

Prepare and prime gypsum boards prior to texturing.

Refer to GA-214 to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

CRITICAL LIGHTING AREAS

Wall and ceiling areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal even minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paints and dark-toned paint finishes highlight surface defects; consider using textures to hide these minor visual imperfections. Finish boards to a Level 5 finish, as outlined in GA-214.

Limitations

- To maximize abuse resistance and eliminate potential screw spin-out, a minimum 20-gauge (.0312 in. design thickness) steel stud is required, as outlined in GA-216.
- Avoid exposure to excessive or continuous moisture and extreme temperatures. Do not expose gypsum board to temperatures exceeding 125°F (52°C) for extended periods of time.
- Properly ventilate or condition attic spaces to remove moisture buildup above gypsum board ceilings. If required, install a vapor retarder in exterior ceilings behind gypsum board.
- Avoid installing gypsum board directly over insulation blankets with facer flanges placed continuously across the face of the framing members; recess insulation blankets and attach flanges to the sides of framing.
- Isolate gypsum board from contact with building structure in locations where structural movement may impose direct loads on gypsum board assemblies.
- Provide control joints spaced not more than 30 ft. (9,144 mm) where employing long continuous runs of walls, partitions or ceilings without perimeter relief.
- Avoid gypsum board joints within 12 in. (305 mm) of the corners of window or door frames unless installing control joints at these locations.
- In single-ply installation, all ends and edges of gypsum board should occur over framing members or other solid backing except where treated joints occur at right angles to framing or furring members.
- Do not use boards as a nailing base as they are nonstructural.
- Avoid using in areas subject to constant and/or excessive moisture and high humidity, such as gang showers, saunas, steam rooms or swimming pool enclosures.
- Avoid using as a backer board directly behind tile in tub and shower areas.
- Do not install in pre-rock conditions.
- Do not finish joints until building is properly closed in and conditioned.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



Hi-Impact® XP®

Gypsum Board

PURPLE 
EVOLVE YOUR WALLS™

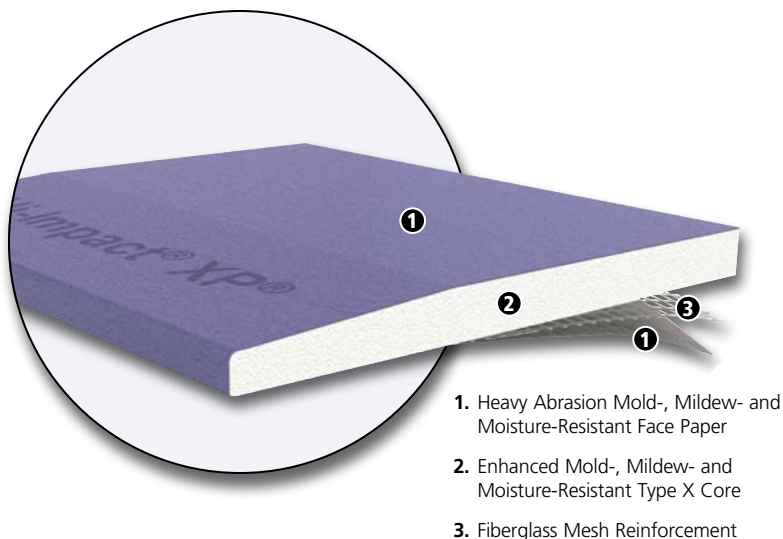
Gold Bond® BRAND Hi-Impact® XP® Gypsum Board consists of a mold-, mildew-, moisture- and fire-resistant Type X gypsum core with a specially designed PURPLE® paper. The PURPLE face paper is a heavy paper that is 100-percent recycled and offers superior abrasion, mold, mildew and moisture resistance. The 100-percent recycled gray back paper is also mold-, mildew- and moisture-resistant. Additionally, it has a fiberglass mesh embedded into the core, providing more impact and penetration resistance.

Use it for interior wall and ceiling applications and in areas with limited water exposure.

For speed of installation, GridMarX® guide marks are printed on the paper surface.

Sizes: 5/8 in. (15.9 mm) thick boards are available in 4 ft. (1,219 mm) widths and standard lengths of 8 ft. (2,438 mm) to 12 ft. (3,658 mm).

Finishing: Tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set™ Setting Compounds. For optimum mold performance, use ProForm® BRAND XP® All Purpose Joint Compound or ProForm® BRAND XP® Lite Joint Compound.



National 
Gypsum®

Note: For abuse and impact test (ASTM C1629) results, see page 388.

Basic Uses

APPLICATIONS

- Use it for interior wall and ceiling assemblies in areas where surface abrasion, indentation, mold, mildew and moisture resistance are major concerns.
- Use 5/8 in. (15.9 mm) Hi-Impact® XP® Gypsum Board where Type X Gypsum Board is specified in certain fire-rated wall assemblies.
- Use it as a tile backer board in dry areas or areas with limited moisture, such as toilet and sink areas and wall and ceiling areas above tile in tubs and showers.

ADVANTAGES

- Specially designed gypsum core with a built-in fiberglass mesh offers superior protection against impact and penetrations into the wall cavity.
- Provides greater resistance to surface abrasion, indentation, impact and penetration over standard gypsum board.
- Resists the growth of mold per ASTM D3273 with a score of 10, the best possible score.
- Resists the growth of mold per ASTM G21 with a score of 0, the best possible score.
- The gypsum core will not support combustion or transmit temperatures greatly in excess of 212°F (100°C) until completely calcined, a slow process.
- Easily scored and snapped to exact size without sawing.
- Dimensionally stable product with negligible expansion and contraction under normal atmospheric conditions.
- Features the GridMarX® guidemarks on the board to allow for faster and more accurate installation.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Installation Recommendations

GENERAL

- Install gypsum board in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.
- GridMarX provides quick identification and uniform nail/screw patterns. Use GridMarX to make accurate cuts without drawing lines. GridMarX guide marks run the length of the board at five points in 4 in. (102 mm) increments. Marks run along the edge in both tapers and at 16 in. (406 mm), 24 in. (610 mm) and 32 in. (813 mm) in the field of the board. The marks cover easily with no bleed-through using standard paint products.
- Apply gypsum board first to ceilings at right angles to framing members, then to walls. Use boards of maximum practical length so that the minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.
- Install batt or blanket ceiling insulation BEFORE the gypsum board on ceilings when installing a vapor retarder behind the gypsum board. Install the insulation IMMEDIATELY after the gypsum board when using loose fill insulation. Avoid installation practices that might allow condensation to form behind boards.
- Cut gypsum board to allow for a minimum 1/4 in. (6.4 mm) gap between gypsum board and floor to prevent potential wicking of moisture.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Locate gypsum board joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these points. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.

TECHNICAL DATA

PHYSICAL PROPERTIES	
	Hi-Impact XP Gypsum Board
Thickness¹, Nominal	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm)
Length^{1,4}, Standard	8' – 12' (2,438 mm – 3,658 mm)
Weight, Nominal	2.8 lbs. / sq. ft. (13.67 k/m ²)
Edges¹	Tapered
Flexural Strength¹, Perpendicular	≥ 147 lbf. (654 N)
Flexural Strength¹, Parallel	≥ 46 lbf. (205 N)
Humidified Deflection¹	≤ 5/8" (15.9 mm)
Nail Pull Resistance¹	≥ 87 lbf. (387 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)
Bending Radius	15' (4,572 mm)
Thermal Resistance⁵	R = .56
Permeance⁶	37 perms
Water Absorption¹ (% of Weight)	< 5%
Mold Resistance⁷, ASTM D3273	Score of 10
Mold Resistance⁸, ASTM G21	Score of 0
Surface Abrasion⁹	Level 3
Indentation⁹	Level 1
Soft-Body Impact⁹	Level 3
Hard-Body Impact⁹	Level 3
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	Type X
UL Type Designation	FSW
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	15
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM C1629 Standard Classification for Abuse Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels	
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi	
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>	
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>	
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths.

Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

6. Tested in accordance with ASTM E96.

7. Tested in accordance with ASTM D3273.

8. Tested in accordance with ASTM G21.

9. Tested in accordance with ASTM methods in ASTM C1629 – D4977 (Surface Abrasion),

D5420 (Indentation), E695 (Soft-Body Impact), Annex A1 (Hard-Body Impact).

Refer to page 388.

- Hold gypsum board in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the face paper of the gypsum board. Remove improperly driven nails or screws.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach gypsum board and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.

FINISHING

Perform finishing of Hi-Impact® XP® Gypsum Board in accordance with GA-214. Joints between Hi-Impact XP Gypsum Board may be finished with either paper tape and ready mix joint compound or fiberglass mesh tape and setting compound, such as ProForm® BRAND Interior Finishing Products. In most areas to receive final decoration, skim coat the entire surface.

DECORATION

Ensure gypsum board surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

Prepare and prime gypsum boards prior to texturing.

Refer to GA-214 to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

CRITICAL LIGHTING AREAS

Wall and ceiling areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paints and dark-toned paint finishes highlight surface defects; consider using textures to hide these minor visual imperfections. Finish boards to a Level 5 finish, as outlined in GA-214.

Limitations

- To maximize impact resistance and eliminate potential screw spin-out, a minimum 20-gauge (.0312 in. design thickness) steel stud is required, as outlined in GA-216.
- Avoid exposure to excessive or continuous moisture and extreme temperatures. Do not expose gypsum board to temperatures exceeding 125°F (52°C) for extended periods of time.
- Properly ventilate or condition attic spaces to remove moisture buildup above gypsum board ceilings. If required, install a vapor retarder in exterior ceilings behind gypsum board.
- Avoid installing gypsum board directly over insulation blankets with facer flanges placed continuously across the face of the framing members; recess insulation blankets and attach flanges to the sides of framing.
- Isolate gypsum board from contact with building structure in locations where structural movement may impose direct loads on gypsum board assemblies.
- Provide control joints spaced not more than 30 ft. (9,144 mm) where employing long continuous runs of walls, partitions or ceilings without perimeter relief.
- Avoid gypsum board joints within 12 in. (305 mm) of the corners of window or door frames unless installing control joints at these locations.
- In single-ply installation, all ends and edges of gypsum board should occur over framing members or other solid backing except where treated joints occur at right angles to framing or furring members.
- Do not use boards as a nailing base as they are nonstructural.
- Avoid using in areas subject to constant and/or excessive moisture and high humidity, such as gang showers, saunas, steam rooms or swimming pool enclosures.
- Avoid using as a backer board directly behind tile in tub and shower areas.
- Do not install in pre-rock conditions.
- Do not finish joints until building is properly closed in and conditioned.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.

SoundBreak® XP®

Gypsum Board

PURPLE 
EVOLVE YOUR WALLS™

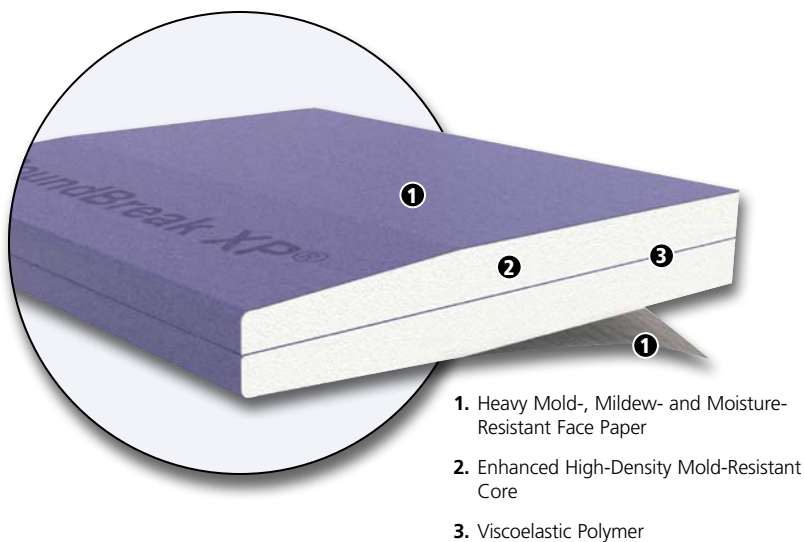
Gold Bond® BRAND SoundBreak® XP® Gypsum Board consists of two pieces of high-density, mold-, mildew- and moisture-resistant gypsum board, with a specially designed PURPLE® paper, laminated together with a sound-damping, viscoelastic polymer. This acoustically enhanced, fire-resistant gypsum core is encased in heavy paper that is 100-percent recycled on both sides and offers superior abrasion, mold, mildew and moisture resistance.

Use it for high-rated Sound Transmission Class (STC) rated wall and ceiling assemblies, where sound transmission between rooms or dwelling units is a concern.

For speed of installation, GridMarX® guide marks are printed on the paper surface.

Sizes: 1/2 in. (12.7 mm) thick Regular Boards and 5/8 in. (15.9 mm) thick Type X Boards are available in 4 ft. (1,219 mm) widths and standard lengths of 8 ft. (2,438 mm) to 12 ft. (3,658 mm). 3/4 in. (19.1 mm) thick Type C SoundBreak Boards are available in 4 ft. (1,219 mm) widths and standard lengths of 8 ft. (2,438 mm) to 10 ft. (3,048 mm).

Finishing: Slightly Tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set™ Setting Compounds. For optimum mold and mildew performance, use ProForm® BRAND XP® All Purpose Joint Compound or ProForm® BRAND XP® Lite Joint Compound.



National 
Gypsum®

Basic Uses

APPLICATIONS

- Use it for interior wall and ceiling assemblies, where sound transmission between rooms or dwelling units is a concern.
- 5/8 in. (15.9 mm) SoundBreak® XP® Gypsum Board may be used where Type X Gypsum Board is specified in fire-rated assemblies.

ADVANTAGES

- Provides high-rated Sound Transmission Class (STC) values per an independent third-party acoustical laboratory using ASTM E90 test procedures.
- Achieves high STC values in a thinner wall assembly, increasing usable floor space.
- Provides STC Ratings up to 56 for single-layer, steel stud partitions and up to 67 for area separation walls.
- Superior sound damping, cost-efficient material that finishes easily and decorates in the same manner as standard gypsum board.
- For speed of installation and lower installation costs, vertical board joints do not require acoustical sealant.
- Resists the growth of mold per ASTM D3273 with a score of 10, the best possible score.
- Resists the growth of mold per ASTM G21 with a score of 0, the best possible score.
- Heavy abrasion-resistant paper and dense core provide greater resistance to surface abuse and indentation when tested in accordance with ASTM C1629. (Refer to page 388.)
- Installs like traditional gypsum board without requiring additional clips or channels.
- Cuts by scoring deeply from both sides before snapping or by using a hand or power saw.
- Fire-resistant material will not support combustion or transmit temperatures greatly in excess of 212°F (100°C) until completely calcined, a slow process.

- Dimensionally stable product with negligible expansion and contraction under normal atmospheric conditions.
- Features the GridMarX® guidemarks on the board to allow for faster and more accurate installation.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Installation Recommendations

GENERAL

- Install gypsum board in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.
- GridMarX provides quick identification and uniform nail/screw patterns. Use GridMarX to make accurate cuts without drawing lines. GridMarX guide marks run the length of the board at five points in 4 in. (102 mm) increments. Marks run along the edge in both tapers and at 16 in. (406 mm), 24 in. (610 mm) and 32 in. (813 mm) in the field of the board. The marks cover easily with no bleed-through using standard paint products.
- Apply gypsum board first to ceilings at right angles to framing members, then to walls. Use boards of maximum practical length so that the minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.
- Install batt or blanket ceiling insulation BEFORE the gypsum board on ceilings when installing a vapor retarder behind the gypsum board. Install the insulation IMMEDIATELY after the gypsum board when using loose fill insulation. Avoid installation practices that might allow condensation to form behind boards.

TECHNICAL DATA

PHYSICAL PROPERTIES			
	1/2" SoundBreak XP Gypsum Board	5/8" SoundBreak XP Gypsum Board	3/4" SoundBreak XP Gypsum Board
Thickness¹, Nominal	1/2" (12.7 mm)	5/8" (15.9 mm)	3/4" (19.1 mm)
Width¹, Nominal	4' (1,219 mm)	4' (1,219 mm)	4' (1,219 mm)
Length^{1,4}, Standard	8' – 12' (2,438 – 3,658 mm)	8' – 12' (2,438 – 3,658 mm)	8' – 10' (2,438 – 3,048 mm)
Weight, Nominal	1.9 lbs. / sq. ft. (9.28 k/m ²)	2.2 lbs. / sq. ft. (10.74 k/m ²)	2.3 lbs. / sq. ft. (11.23 k/m ²)
Edges¹	Slightly Tapered	Slightly Tapered	Slightly Tapered
Flexural Strength¹, Perpendicular	≥ 107 lbf. (476 N)	≥ 147 lbf. (654 N)	≥ 167 lbf. (743 N)
Flexural Strength¹, Parallel	≥ 36 lbf. (160 N)	≥ 46 lbf. (205 N)	≥ 56 lbf. (249 N)
Humidified Deflection¹	≤ 10/8" (31.8 mm)	≤ 5/8" (15.9 mm)	N/A
Nail Pull Resistance¹	≥ 77 lbf. (343 N)	≥ 87 lbf. (387 N)	≥ 87 lbf. (387 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)
Bending Radius	10' (3,048 mm)	15' (4,572 mm)	N/A
Thermal Resistance⁵	R = .45	R = .56	R = .64
Permeance⁵	45 perms	37 perms	N/A
Mold Resistance², ASTM D3273	Score of 10	Score of 10	N/A
Mold Resistance², ASTM G21	Score of 0	Score of 0	N/A
Surface Abrasion⁹	Level 3	Level 3	N/A
Indentation⁹	Level 1	Level 1	N/A
Soft-Body Impact⁹	Level 1	Level 2	N/A
Hard-Body Impact⁹	N/A	Level 1	N/A
Product Standard Compliance	ASTM C1396, C1766	ASTM C1396, C1766	ASTM C1396, C1766
Fire-Resistance Characteristics			
Core Type	Regular	Type X	SoundBreak
UL Type Designation	N/A	SoundBreak XP	SoundBreak
Combustibility²	Non-combustible Core	Non-combustible Core	Non-combustible Core
Surface Burning Characteristics³	Class A	Class A	Class A
Flame Spread³	15	15	15
Smoke Development³	0	0	0
Applicable Standards and References			
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products			
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus			
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board			
ASTM C1396 Standard Specification for Gypsum Board			
ASTM C1629 Standard Classification for Abuse Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels			
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber			
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials			
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials			
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C			
ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi			
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>			
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>			
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>			
National Gypsum Company, <i>NGC Construction Guide</i>			

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths.

Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

6. Tested in accordance with ASTM E96.

7. Tested in accordance with ASTM D3273.

8. Tested in accordance with ASTM G21.

9. Tested in accordance with ASTM methods in ASTM C1629 – D4977 (Surface Abrasion),

D5420 (Indentation), E695 (Soft-Body Impact), Annex A1 (Hard-Body Impact).

Refer to page 388.

- Cut gypsum board to allow for a minimum 1/4 in. (6.4 mm) gap between gypsum board and floor to prevent potential wicking of moisture.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Locate gypsum board joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Hold gypsum board in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the face paper of the gypsum board. Remove improperly driven nails or screws.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach gypsum board and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.

FINISHING

Joints between SoundBreak® XP® Gypsum Board may be finished with either paper tape and ready mix joint compound or fiberglass mesh or paper tape and setting compound, such as ProForm® BRAND Interior Finishing Products.

DECORATION

Ensure gypsum board surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

Prepare and prime gypsum boards prior to texturing.

Refer to GA-214 to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

CRITICAL LIGHTING AREAS

Wall and ceiling areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paints and dark-toned paint finishes highlight surface defects; consider using textures to hide these minor visual imperfections. Finish boards to a Level 5 finish, as outlined in GA-214.

Limitations

- Avoid exposure to excessive or continuous moisture and extreme temperatures. Do not expose gypsum board to temperatures exceeding 125°F (52°C) for extended periods of time.
- Properly ventilate or condition attic spaces to remove moisture buildup above gypsum board ceilings. If required, install a vapor retarder in exterior ceilings behind gypsum board.
- Avoid installing gypsum board directly over insulation blankets with facer flanges placed continuously across the face of the framing members; recess insulation blankets and attach flanges to the sides of framing.
- Isolate gypsum board from contact with building structure in locations where structural movement may impose direct loads on gypsum board assemblies.
- Provide control joints spaced not more than 30 ft. (9,144 mm) where employing long continuous runs of walls, partitions or ceilings without perimeter relief.
- Avoid gypsum board joints within 12 in. (305 mm) of the corners of window or door frames unless installing control joints at these locations.
- In single-ply installation, all ends and edges of gypsum board should occur over framing members or other solid backing except where treated joints occur at right angles to framing or furring members.
- Apply 1/2 in. (12.7 mm) gypsum board ceilings to be decorated with water-based spray texture perpendicular to the framing spaced a maximum of 16 in. (406 mm) o.c.
- Space supporting framing for single-layer application of 1/2 in. (12.7 mm) gypsum board a maximum of 24 in. (610 mm) o.c.
- Do not use boards as a nailing base as they are nonstructural.
- Avoid using in areas subject to constant and/or excessive moisture and high humidity, such as gang showers, saunas, steam rooms or swimming pool enclosures.
- Avoid using as a backer board directly behind tile in tub and shower areas.
- Do not install in pre-rock conditions.
- Do not finish joints until building is properly closed in and conditioned.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.

Shaftliner XP®

Gypsum Board

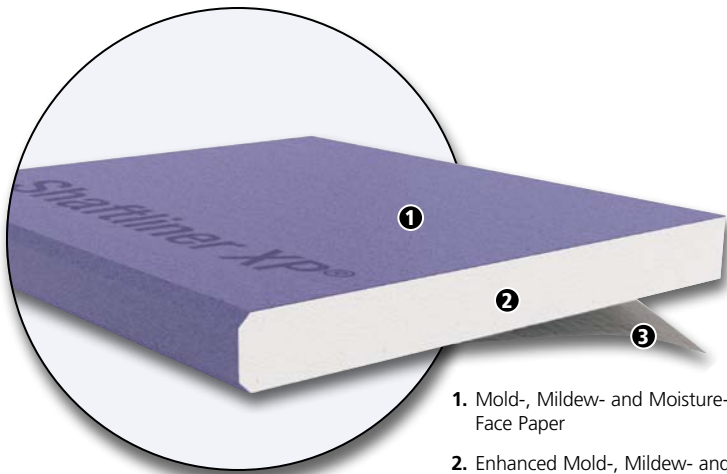
PURPLE 
EVOLVE YOUR WALLS™

Gold Bond® BRAND Shaftliner XP® Gypsum Board consists of a mold-, mildew-, moisture- and fire-resistant gypsum core with a specially designed, 100-percent recycled PURPLE® paper on the face and back sides. The face paper is folded around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth. Long edges are double beveled for ease of installation.

Use it to construct lightweight fire barriers for cavity shaftwalls (1-4 hr.) and area separation fire walls (2 hr.).

To help speed installation, GridMarX® guide marks are printed on the paper surface.

Sizes: 1 in. (25.4 mm) thick shaftliner is available in 2 ft. (610 mm) widths and standard lengths of 8 ft. (2,438 mm) to 12 ft. (3,658 mm).



1. Mold-, Mildew- and Moisture-Resistant Face Paper
2. Enhanced Mold-, Mildew- and Moisture-Resistant Type X Core
3. Heavy Mold-, Mildew- and Moisture-Resistant Back Paper



National 
Gypsum®

Gold Bond® BRAND Shaftliner XP® Gypsum Board

Basic Uses

APPLICATIONS

Use it to construct lightweight fire barriers for cavity shaftwalls (1-4 hr.) and area separation fire walls (2 hr.).

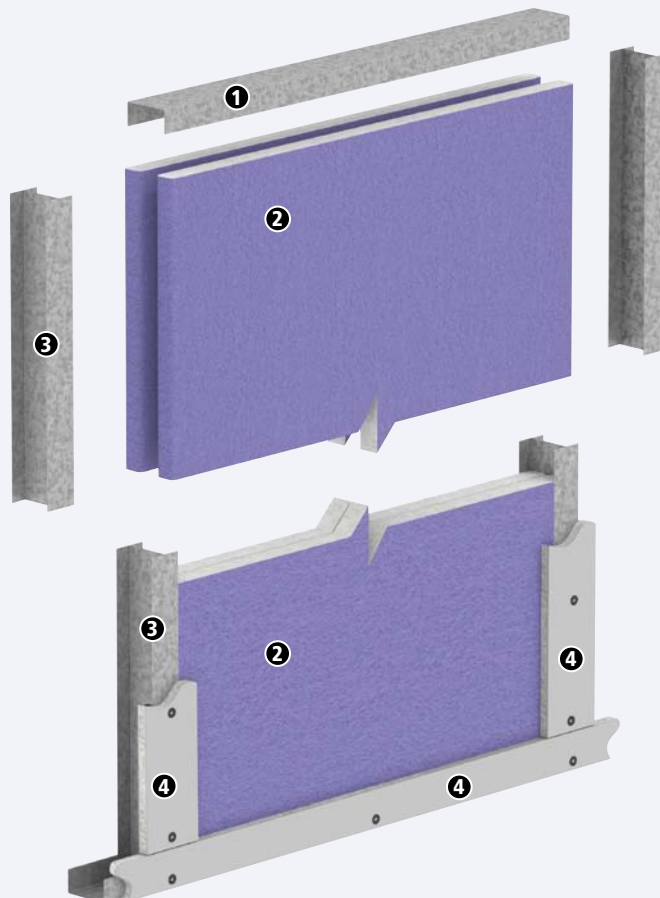
ADVANTAGES

- Approved component in specific UL fire-rated designs.
- Resists the growth of mold per ASTM D3273 with a score of 10, the best possible score.
- Resists the growth of mold per ASTM G21 with a score of 0, the best possible score.
- Dimensionally stable product with negligible expansion and contraction under normal atmospheric conditions.
- Cuts easily for quick installation.

- The gypsum core will not support combustion or transmit temperatures greatly in excess of 212°F (100°C) until completely calcined, a slow process.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

BASIC COMPONENTS OF AREA SEPARATION WALL

1. 2" C-Track
2. 1" Shaftliner XP®
3. 2" H-Stud
4. 1/2" Fire-Shield® C Gypsum Batten



TECHNICAL DATA

PHYSICAL PROPERTIES	
	Shaftliner XP
Thickness¹, Nominal	1" (25.4 mm)
Width¹, Nominal	2' (610 mm)
Length^{1,4}, Standard	8' – 12' (2,438 mm – 3,658 mm)
Weight, Nominal	3.75 lbs. / sq. ft. (18.31 k/m ²)
Edges¹	Double Beveled
Flexural Strength¹, Perpendicular	≥ 228 lbf. (1,014 N)
Flexural Strength¹, Parallel	≥ 77 lbf. (343 N)
Humidified Deflection¹	N/A
Nail Pull Resistance¹	≥ 87 lbf. (387 N)
Hardness¹ – Core, Edges and Ends	≥ 11 lbf. (49 N)
Thermal Resistance⁵	R = .83
Mold Resistance⁶, ASTM D3273	Score of 10
Mold Resistance⁷, ASTM G21	Score of 0
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	Type X
UL Type Designation	FSW
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	15
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi	
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>	
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>	
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

6. Tested in accordance with ASTM D3273.

7. Tested in accordance with ASTM G21.

Installation Recommendations

GENERAL

- Install Shaftliner XP® consistent with methods described in specific application details for National Gypsum Cavity Shaftwall Systems or Area Separation Fire Wall Systems in *NGC Construction Guide*, or with other fire-resistance-rated designs.
- Install fire-rated assemblies in accordance with the details found in the *UL Fire Resistance Directory* or Gypsum Association, GA-600, *Fire Resistance Design Manual*. Maintain adequate ventilation in the working area during installation and curing period.

Limitations

- Avoid exposure to excessive or continuous moisture.
- Avoid exposure to extreme temperatures. Do not use shaftliner where it will be exposed to temperatures exceeding 125°F (52°C) for extended periods of time.
- Do not use shaftliner in an unlined air supply duct.
- Refer to height limitations in the applicable *NGC Construction Guide* section. See page 351.
- Isolate shaftliner from contact with building structure in locations where structural movement may impose direct loads on shaftliner assemblies.
- Do not immerse Shaftliner XP in water and do not subject to cascading water.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



EXP® Sheathing

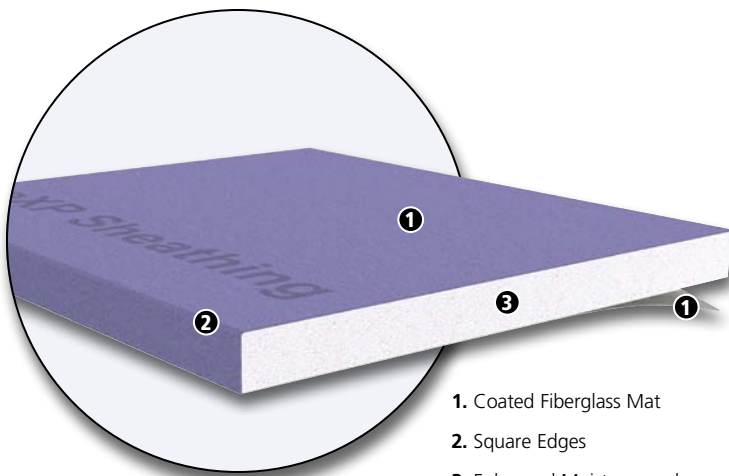
PURPLE 
EVOLVE YOUR WALLS™

Gold Bond® BRAND EXP® Sheathing consists of a moisture- and mold-resistant gypsum core encased in a coated, specially designed PURPLE® fiberglass mat on the face, back and sides. It is available in either a Regular or Type X core. The glass mat is folded around the long edges to reinforce and protect the core, and it provides superior weather resistance.

Use it for attachment to the outside of wall and soffit framing as a substrate for exterior cladding. It is available with either a Regular or Type X core.

For speed of installation, GridMarX® guide marks are printed on the glass mat surface.

Sizes: 1/2 in. (12.7 mm) thick Regular and 5/8 in. (15.9 mm) thick EXP® Fire-Shield® Type X Panels are available in 4 ft. (1,219 mm) widths and in standard lengths of 8 ft. (2,438 mm) to 10 ft. (3,048 mm).



1. Coated Fiberglass Mat
2. Square Edges
3. Enhanced Moisture- and Mold-Resistant Gypsum Core

Gold Bond® BRAND
EXP®
Sheathing

EXP® Panels

National 
Gypsum®

Basic Uses

APPLICATIONS

- Use it as a sheathing on wood or steel framing to provide fire resistance and weather protection when used under exterior claddings, such as wood, vinyl and fiber cement siding, masonry veneer, Exterior Insulation and Finish Systems (EIFS) and stucco.
- Use it as a sheathing in fire-resistance-rated exterior wall assemblies and/or for soffit framing.

ADVANTAGES

- Manufactured to meet ASTM C1177 (Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing).
- Fire-resistant material with a non-combustible gypsum core helps protect framing elements, even when cladding is combustible.
- Does not require taping of joints when used in fire-rated exterior wall assemblies.
- Resists the growth of mold per ASTM D3273 with a score of 10, the best possible score.
- Provides superior water resistance without impeding vapor transmission.
- Scores and snaps to exact size without sawing.
- Dimensionally stable under changes in temperature and relative humidity and resists warping, rippling, buckling and sagging.
- Ideally suited for soffit applications and radius applications.
- Offers a 12-month extended exposure warranty for typical weather conditions. Refer to National Gypsum Company limited warranties for further details.
- Coated fiberglass facers for easy handling.
- Features the GridMarX® guide marks on the panel to allow for faster and accurate installation.

Installation Recommendations

GENERAL

Install EXP® Sheathing in accordance with National Gypsum Company written recommendations: GA-253, *Application of Gypsum Sheathing*; ASTM C1280 *Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing*; and other standards referenced in this document.

FASTENING

Nails: Galvanized, 11-gauge, 7/16 in. (11.1 mm) head, 1-1/2 in. (38.1 mm) long for 1/2 in. (12.7 mm) sheathing and 1-3/4 in. (44.5 mm) long for 5/8 in. (15.9 mm) sheathing.

Screws: ASTM C1002 or ASTM C954, 1-1/4 in. (31.8 mm) long Type W for wood framing and 1 in. (25.4 mm) long Type S-12 for metal framing.

Staples: Galvanized 16-gauge, 7/16 in. (11.1 mm) crown, 1-1/2 in. (38.1 mm) long for 1/2 in. (12.7 mm) sheathing and 1-5/8 in. (41.3 mm) long for 5/8 in. (15.9 mm) sheathing.

Fasteners (nail or screw heads or the crown of staples) should bear tightly against the face of the sheathing panel but should not cut into the facer. Staples should be driven with the crown parallel to the framing. Fasteners should be no less than 3/8 in. (9.5 mm) from the edges and ends of the panel. When shear values are not required, fasteners should be spaced not more than 8 in. (203 mm) o.c. along the vertical ends or edges and intermediate supports.

SHEATHING

EXP Sheathing may be attached parallel to or perpendicular to wood or metal framing. For horizontal applications, install EXP Sheathing with end joints staggered.

Use appropriate panel orientation for specific fire assemblies and shear wall applications, as required by the design.

Install EXP Sheathing with vertical edges butting over the center of framing members. Fit sheathing snugly around all openings.

Install panels with a 3/8 in. (9.5 mm) gap where non-load-bearing construction abuts structural elements.

To prevent wicking, install panels with a 1/4 in. (6.4 mm) gap where they abut masonry or similar materials that might retain moisture.

TECHNICAL DATA

PHYSICAL PROPERTIES		
	EXP Sheathing	EXP Sheathing Fire-Shield
Thickness¹, Nominal	1/2" (12.7 mm)	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm)	4' (1,219 mm)
Length^{1,4}, Standard	8' – 10' (2,438 mm – 3,048 mm)	8' – 10' (2,438 mm – 3,048 mm)
Weight, Nominal	1.9 lbs. / sq. ft. (9.28 k/m ²)	2.5 lbs. / sq. ft. (12.21 k/m ²)
Edges¹	Square	Square
Flexural Strength¹, Perpendicular	≥ 100 lbf. (445 N)	≥ 140 lbf. (623 N)
Flexural Strength¹, Parallel	≥ 80 lbf. (356 N)	≥ 100 lbf. (445 N)
Humidified Deflection¹	≤ 2/8" (6.4 mm)	≤ 1/8" (3.2 mm)
Nail Pull Resistance¹	≥ 80 lbf. (356 N)	≥ 90 lbf. (400 N)
Hardness¹ – Core, Edges and Ends	≥ 15 lbf. (67 N)	≥ 15 lbf. (67 N)
Bending Radius	6' (1,829 mm)	8' (2,438 mm)
Thermal Resistance⁵	R = .43	R = .50
Permeance⁶	22 perms	19 perms
Water Absorption¹ (% of Weight)	≤ 10%	≤ 10%
Linear Expansion with Change Moisture	6.25 x 10 ⁻⁶ in./in./%RH	6.25 x 10 ⁻⁶ in./in./%RH
Coefficient of Thermal Expansion	9.26 x 10 ⁻⁶ in./in./°F	9.26 x 10 ⁻⁶ in./in./°F
Racking Strength⁷ (Ultimate – not design value)	> 540 lbs./ft. (732 N/m)	> 654 lbs./ft. (887 N/m)
Mold Resistance⁸, ASTM D3273	Score of 10	Score of 10
Compressive Strength⁹	≥ 500 psi	≥ 500 psi
Product Standard Compliance	ASTM C1177	ASTM C1177
Fire-Resistance Characteristics		
Core Type	Regular	Type X
UL Type Designation	N/A	FSW-6
Combustibility²	Non-combustible Core	Non-combustible Core
Surface Burning Characteristics³	Class A	Class A
Flame Spread⁴	0	0
Smoke Development³	0	0
Applicable Standards and References		
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products		
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus		
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board		
ASTM C1177 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing		
ASTM C1280 Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing		
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber		
ASTM E72 Standard Test Methods of Conducting Strength Tests of Panels for Building Construction		
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials		
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials		
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C		
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>		
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>		
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>		
Gypsum Association, GA-253, <i>Application of Gypsum Sheathing</i>		
National Gypsum Company, <i>NGC Construction Guide</i>		

1. Specified minimum values per ASTM C1177, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

6. Tested in accordance with ASTM E96.

7. Tested in accordance with ASTM E72.

8. Tested in accordance with ASTM D3273.

9. Tested in accordance with ASTM C473, annex X3.

Locate control joints as required by building design and as recommended by the manufacturer of the specified cladding material.

VINYL, WOOD AND FIBER CEMENT SIDING

Apply horizontal siding and vertical siding panels directly over EXP® Sheathing covered with weather resistant barrier. Butt siding joints over framing members. Fasteners should have a minimum 1 in. (25.4 mm) penetration into each wood framing member and penetration of each metal framing member recommended by fastener manufacturer.

STUCCO

Nail or screw 3.4 lb. self-furring galvanized Diamond Mesh metal lath through weather resistant barrier and EXP Sheathing into the framing. Install metal lath immediately after installing EXP Sheathing.

BRICK VENEER

Wall ties for masonry veneer should be fastened through EXP Sheathing with fasteners that penetrate a minimum of 1 in. (25.4 mm) into wood framing and recommended penetration of cold-formed metal framing. Maintain an air space of minimum 2 in. (50.8 mm) between EXP Sheathing and brick veneer per recommendations of the Brick Institute of America.

SHEAR WALL APPLICATIONS WITH EXP SHEATHING

For shear walls constructed with 1/2 in. (12.7 mm) and 5/8 in. (15.9 mm) EXP Sheathing, apply sheathing vertically to wood studs 16 in. (406 mm) o.c. with 11-gauge, 1-3/4 in. (44.5 mm) long, galvanized nails 4 in. (102 mm) o.c. at edges and 8 in. (203 mm) o.c. at intermediate studs.

Corner Bracing: Where continuous diagonal bracing is required, many building codes allow the use of 48 in. (1,219 mm) wide 5/8 in. (15.9 mm) gypsum sheathing panels applied vertically to be used in place of 1 in. (25.4 mm) x 4 in. (102 mm) wood let-in or metal strap bracing.

Shear Walls: Where wind or seismic forces require shear walls to resist these lateral forces, most building codes provide allowable shear values for walls having gypsum sheathing applied vertically to wood framing. Specific values with construction requirements and limitations are contained in the model building code (ICC: International Building Code [IBC] and International Residential Code for One- and Two-Family Dwellings [IRC]). Shear values for all gypsum panels, including gypsum sheathing, are defined in GA-229-08, *Shear Values for Screw Application of Gypsum Board on Walls*.

SAFETY

Installers should wear long pants and a long-sleeved, loose fitting shirt. Use protective gloves and special eye protection (goggles or safety glasses with side shield). Wear a dust mask when sanding; you may need additional breathing protection in extremely dusty conditions. Do not use a power saw to cut this product.

Caution: Because this product contains fiberglass, dust and glass fibers may be released during normal handling, which could result in eye or skin irritation or cause difficulty in breathing. Whenever possible, avoid contact with the skin and eyes and avoid breathing dust or fibers that may be released during installation. Consult the SDS for this product, available at purplechoice.info before use.

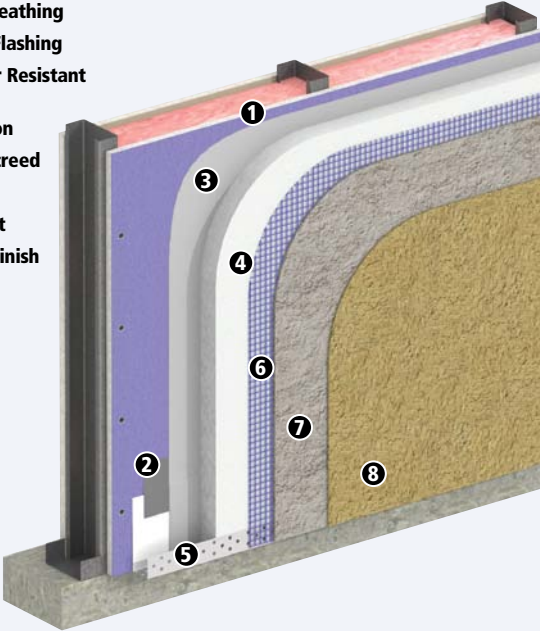
Limitations

- EXP Sheathing is not a finished surface, nor is it a substrate for the direct application of joint compound, stucco, paint or textures. Placement of vapor retarders within the wall assembly is the responsibility of the design professional.
- Do not use EXP Sheathing as a nailing base. Mechanical fasteners should pass through the sheathing and engage the framing member behind the panel.
- Install materials used in conjunction with EXP Sheathing per the respective manufacturer's recommendations.
- EXP Sheathing is resistant to weather, but it is not intended for immersion in water and should not be subjected to ponding or to cascading water conditions.
- Do not apply EXP Sheathing below grade. Comply with building code grade clearance requirements.

Common EXP® Sheathing Exterior Applications

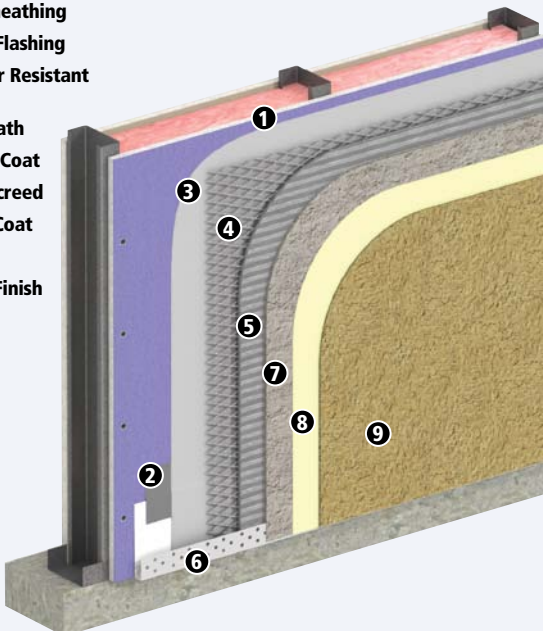
EIFS

- 1. EXP® Sheathing
- 2. Screed Flashing
- 3. Weather Resistant Barrier
- 4. Insulation
- 5. Weep Screed
- 6. Mesh
- 7. Basecoat
- 8. Stucco Finish Coat



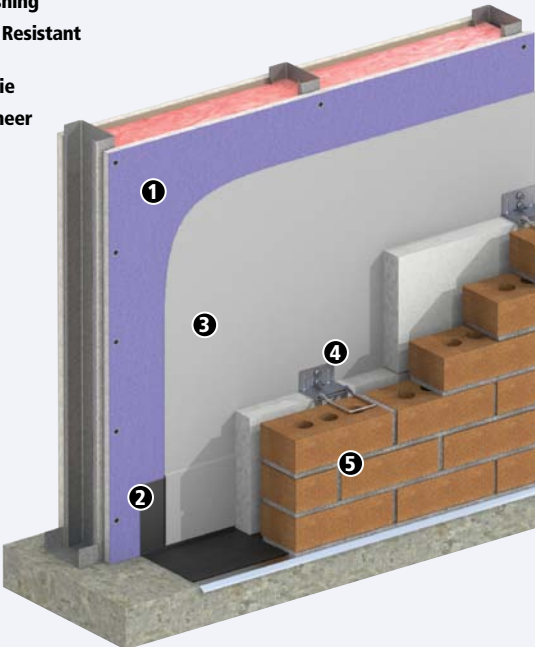
STUCCO

- 1. EXP® Sheathing
- 2. Screed Flashing
- 3. Weather Resistant Barrier
- 4. Metal Lath
- 5. Scratch Coat
- 6. Weep Screed
- 7. Brown Coat
- 8. Primer
- 9. Stucco Finish Coat



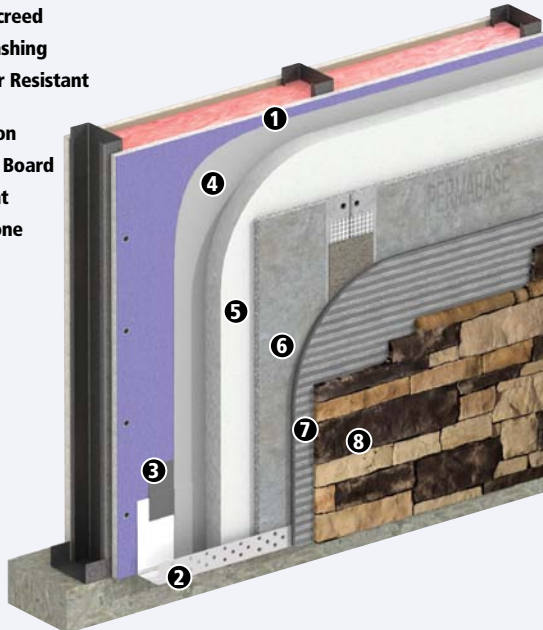
BRICK VENEER

- 1. EXP® Sheathing
- 2. Base Flashing
- 3. Weather Resistant Barrier
- 4. Veneer Tie
- 5. Brick Veneer



THIN STONE VENEER

- 1. EXP® Sheathing
- 2. Weep Screed
- 3. Base Flashing
- 4. Weather Resistant Barrier
- 5. Insulation
- 6. Cement Board
- 7. Basecoat
- 8. Thin Stone Veneer

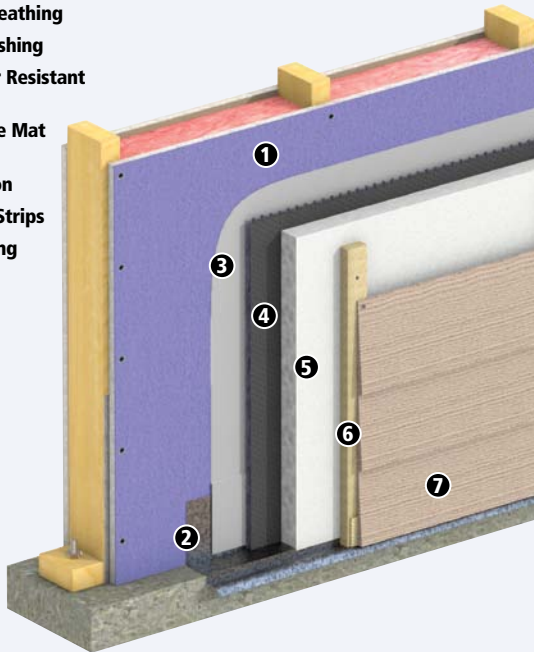


EXP® Panels

Common EXP® Sheathing Exterior Applications

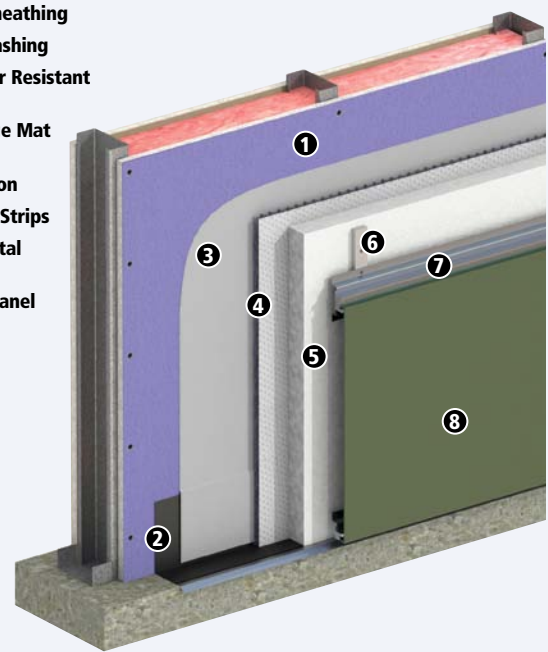
FIBER CEMENT WOOD STUDS

1. EXP® Sheathing
2. Base Flashing
3. Weather Resistant Barrier
4. Drainage Mat
5. Rigid Insulation
6. Furring Strips
7. Lap Siding



METAL PANEL

1. EXP® Sheathing
2. Base Flashing
3. Weather Resistant Barrier
4. Drainage Mat
5. Rigid Insulation
6. Furring Strips
7. Horizontal Girts
8. Metal Panel System



- Do not laminate EXP Sheathing directly to masonry surfaces; fasten panels to furring strips or framing.
- EXP Sheathing is not intended for tile applications. For tile applications, Gold Bond® BRAND EXP® Tile Backer or PermaBase® BRAND Cement Board is recommended.
- Gypsum sheathing is not a replacement for specific structurally engineered sheathing in shear wall designs.
- Adhesive-only application of EXP® Sheathing to framing is not recommended.
- Framing supports must not exceed 24 in. (610 mm) o.c.
- Design details, including fasteners, sealants and control joints, must be properly installed per system specifications. Openings and penetrations must be properly flashed and sealed according to code, building design and weather resistant barrier manufacturer's instructions. Failure to do so will void the warranty; refer to EXP Sheathing warranty for terms, conditions and limitations.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



EXP® Shaftliner

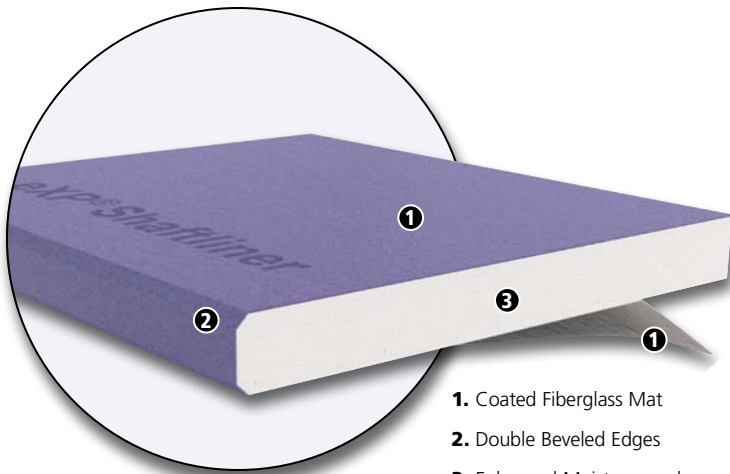
PURPLE 
EVOLVE YOUR WALLS™

Gold Bond® BRAND EXP® Shaftliner consists of a moisture- and mold-resistant gypsum core encased in a coated, specially designed PURPLE® fiberglass mat on the face, back and sides. It is available in a Type X core. The glass mat is folded around the long edges to reinforce and protect the core.

Use it to construct lightweight fire barriers for cavity shaftwalls (1-4 hr.) and area separation fire walls (2 hr.).

For ease of installation, the long edges of EXP® Shaftliner are double beveled.

Sizes: 1 in. (25.4 mm) thick panels are available in 2 ft. (610 mm) widths and standard lengths of 8 ft. (2,438 mm) to 12 ft. (3,658 mm).



1. Coated Fiberglass Mat
2. Double Beveled Edges
3. Enhanced Moisture- and Mold-Resistant Gypsum Core

Gold Bond® BRAND
EXP®
Shaftliner

EXP® Panels

National 
Gypsum®

Basic Uses

APPLICATIONS

Use EXP® Shaftliner to construct lightweight fire barriers for cavity shaftwalls (1–4 hr.) and area separation fire walls (2 hr.).

ADVANTAGES

- Approved component in specific UL fire-rated designs.
- Resists the growth of mold per ASTM D3273 with a score of 10, the best possible score.
- Provides superior water resistance, without impeding vapor transmission.
- Scores and snaps to exact size without sawing.
- Dimensionally stable under changes in temperature and relative humidity and resists warping, rippling, buckling and sagging.
- Offers a 12-month extended exposure warranty for typical weather conditions. Refer to National Gypsum Company limited warranties for further details.
- Fiberglass mat on face and back has special coating for easy handling.

Installation Recommendations

GENERAL

- Install EXP Shaftliner consistent with methods described in specific application details for National Gypsum Cavity Shaftwall Systems or Area Separation Fire Wall Systems in *NGC Construction Guide*, or with other fire-resistance-rated designs.

SAFETY

Installers should wear long pants and a long-sleeved, loose fitting shirt. Use protective gloves and special eye protection (goggles or safety glasses with side shield). Wear a dust mask when sanding; you may need additional breathing protection in extremely dusty conditions. Do not use a power saw to cut this product.

Caution: Because this product contains fiberglass, dust and glass fibers may be released during normal handling, which could result in eye or skin irritation or cause difficulty in breathing. Whenever possible, avoid contact with the skin and eyes and avoid breathing dust or fibers that may be released during installation. Consult the SDS for this product, available at purplechoice.info before use.

Limitations

- Avoid exposure to excessive or continuous moisture.
- Avoid exposure to extreme temperatures. Do not expose glass mat gypsum panels to temperatures exceeding 125°F (52°C) for extended periods of time.
- Do not use EXP Shaftliner Panels in an unlined air supply duct.
- Refer to height limitations in the applicable *NGC Construction Guide* section. Refer to page 351.
- Isolate gypsum panels from contact with building structure in locations where structural movement may impose direct loads on gypsum panel assemblies.
- EXP Shaftliner is weather resistant, but do not immerse in water and do not subject to cascading water conditions.

TECHNICAL DATA

PHYSICAL PROPERTIES	
	EXP Shaftliner
Thickness¹, Nominal	1" (25.4 mm)
Width¹, Nominal	2' (610 mm)
Length^{1,4}, Standard	8' – 12' (2,438 mm – 3,658 mm)
Weight, Nominal	3.75 lbs. / sq. ft. (18.31 k/m ²)
Edges¹	Double Beveled
Flexural Strength¹, Perpendicular	≥ 230 lbf. (1,023 N)
Flexural Strength¹, Parallel	≥ 80 lbf. (356 N)
Humidified Deflection¹	N/A
Nail Pull Resistance¹	≥ 80 lbf. (356 N)
Hardness¹ – Core, Edges and Ends	≥ 15 lbf. (67 N)
Thermal Resistance⁵	R = .65
Water Absorption¹ (% of Weight)	≤ 5%
Linear Expansion with Change Moisture	6.25 x 10 ⁻⁶ in./in./%RH
Coefficient of Thermal Expansion	9.26 x 10 ⁻⁶ in./in./°F
Mold Resistance⁶, ASTM D3273	Score of 10
Product Standard Compliance	ASTM C1658
Fire-Resistance Characteristics	
Core Type	Type X
UL Type Designation	FSW-7
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	0
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1658 Standard Specification for Glass Mat Gypsum Panels	
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>	
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified minimum values per ASTM C1658, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

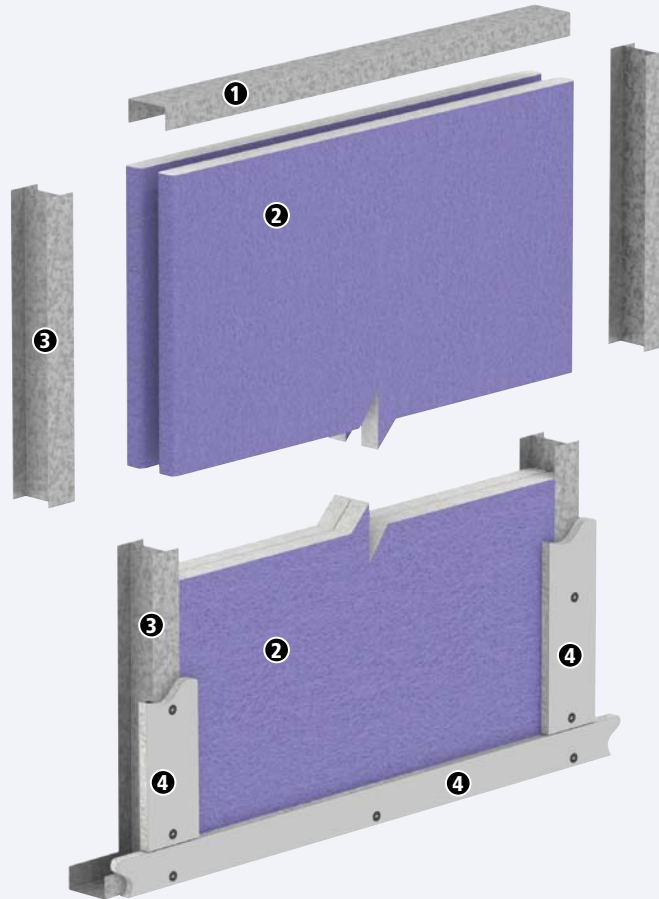
4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

6. Tested in accordance with ASTM D3273.

Basic Components of Area Separation Wall

1. 2" H-Stud Track
2. eXP® Shaftliner
3. 2" H-Stud
4. 1/2" Fire-Shield® C Gypsum Batten



For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



EXP® Tile Backer

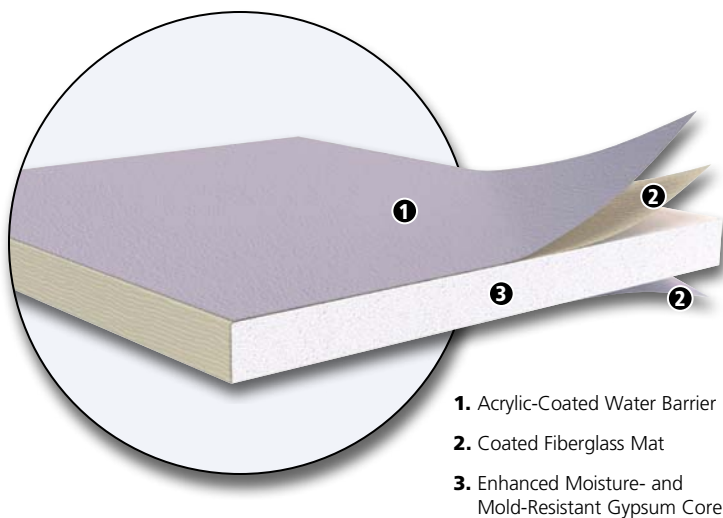
Regular and Fire-Shield® Type X

PURPLE 
EVOLVE YOUR WALLS™

Gold Bond® BRAND EXP® Tile Backer consists of a moisture- and mold-resistant gypsum core encased in an acrylic-coated, specially designed fiberglass mat on the face, back and sides. It is available in either a Regular or Type X core. The glass mat is folded around the long edges to reinforce and protect the core.

Use it as a substrate for tile applications in high-moisture areas, including showers, bathrooms, indoor swimming pools, laundry rooms and kitchens. It is also a code-compliant substrate for tile and other finishes in both wet and non-wet areas, areas of high humidity and fire-rated assemblies. It is ideally suited for a variety of interior applications.

Sizes: 1/2 in. (12.7 mm) and 5/8 in. (15.9 mm) thick panels are available in 4 ft. (1,219 mm) widths and in standard lengths of 8 ft. (2,438 mm).



1. Acrylic-Coated Water Barrier
2. Coated Fiberglass Mat
3. Enhanced Moisture- and Mold-Resistant Gypsum Core

Gold Bond® BRAND
EXP®
Tile Backer

EXP® Panels

National 
Gypsum®

Basic Uses

APPLICATIONS

- Use in both wood- and metal-framed construction for interior wall, ceiling and countertop assemblies as a substrate for tile and other finishes. It provides increased mold and moisture resistance in both wet and non-wet areas, areas of high humidity and in fire-rated assemblies.
- The specially formulated 5/8 in. (15.9 mm) Type X core has superior fire-resistive performance when used in specific fire-rated assemblies.

ADVANTAGES

- Acrylic-coated fiberglass front facer provides an integral water barrier, eliminating the need for a separate water barrier.
- Approved for use in high-moisture environments, such as baths, showers, indoor pools, kitchens and laundry rooms.
- 5/8 in. (15.9 mm) EXP® Tile Backer is an approved component in specific UL fire-rated designs.
- Resists the growth of mold per ASTM D3273 with a score of 10, the best possible score.
- Coated fiberglass facers for easy handling.
- Dimensionally stable under changes in temperature and relative humidity and resists warping, rippling, buckling and sagging.
- Achieves GREENGUARD Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.

Installation Recommendations

GENERAL

- Install EXP Tile Backer in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which tile backer boards are to be applied. Remedy all defects prior to installation of the gypsum panel.
- Do not embed EXP Tile Backer into mortar bed in showers. Install with gray side facing away from the framing, apply tile/finishes to the gray side.
- Score/cut from the gray side using a standard utility knife. Cut outs are made easily with a utility knife or saw. Panel joints must be tight. Fill gaps and inside corners with flexible sealant.
- Drive fasteners flush with the panel surface; do not countersink.
- Hold tile backer boards in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the panels toward the edges and ends. Take care to avoid breaking the facer of the tile backer board. Remove improperly driven nails or screws.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Embed alkali-resistant fiberglass tape with the tile setting material at tile backer board joints prior to tile installation.
- Maintain a room temperature of not less than 40°F (4°C) during application of tile backer boards.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the tile backer boards and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.
- Install fire-rated assemblies in accordance with the details found in the *UL Fire Resistance Directory* or the Gypsum Association, *GA-600, Fire Resistance Design Manual*.
- Avoid installing water-sensitive materials on EXP Tile Backer Panels in pre-rock applications until the building is enclosed.

TECHNICAL DATA

PHYSICAL PROPERTIES		
	EXP Tile Backer	EXP Fire-Shield Tile Backer
Thickness¹, Nominal	1/2" (12.7 mm)	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm)	4' (1,219 mm)
Length¹, Standard	8' (2,438 mm)	8' (2,438 mm)
Weight, Nominal	2.0 lbs. / sq. ft. (9.76 k/m ²)	2.5 lbs. / sq. ft. (12.21 k/m ²)
Edges¹	Square	Square
Flexural Strength¹, Perpendicular	≥ 100 lbf. (445 N)	≥ 140 lbf. (623 N)
Flexural Strength¹, Parallel	≥ 80 lbf. (356 N)	≥ 100 lbf. (445 N)
Humidified Deflection¹	≤ 2/8" (6.4 mm)	≤ 1/8" (3.2 mm)
Nail Pull Resistance¹	≥ 70 lbf. (311 N)	≥ 90 lbf. (400 N)
Hardness¹ – Core, Edges and Ends	≥ 15 lbf. (67 N)	≥ 15 lbf. (67 N)
Bending Radius	12' (3,658 mm)	16' (4,877 mm)
Thermal Resistance⁴	R = .43	R = .50
Permeance⁵	2 perms	2 perms
Water Absorption¹ (% of Weight)	≤ 5%	≤ 5%
Surface Water Absorption¹	≤ .5 grams	≤ .5 grams
Linear Expansion with Change Moisture	6.25 x 10 ⁻⁶ in./in./%RH	6.25 x 10 ⁻⁶ in./in./%RH
Coefficient of Thermal Expansion	9.26 x 10 ⁻⁶ in./in./°F	9.26 x 10 ⁻⁶ in./in./°F
Mold Resistance⁶, ASTM D3273	Score of 10	Score of 10
Mold Resistance⁷, ASTM D6329	Yes	Yes
Product Standard Compliance	ASTM C1178	ASTM C1178
Fire-Resistance Characteristics		
Core Type	Regular	Type X
UL Type Designation	N/A	FSW-6
Combustibility²	Non-combustible Core	Non-combustible Core
Surface Burning Characteristics³	Class A	Class A
Flame Spread⁴	0	0
Smoke Development³	0	0
Applicable Standards and References		
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products		
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus		
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board		
ASTM C1178 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing		
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber		
ASTM D6329 Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers		
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials		
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials		
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C		
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>		
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>		
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>		
National Gypsum Company, <i>NGC Construction Guide</i>		

1. Specified minimum values per ASTM C1178, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Tested in accordance with ASTM C518.

5. Tested in accordance with ASTM E96.

6. Tested in accordance with ASTM D3273.

7. Tested in accordance with ASTM D6329.

Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

CEILINGS

- Apply tile backer boards first to ceilings at right angles to framing members, then to walls. Use panels of maximum practical length so that the minimum number of end joints occur. Bring panel edges into contact with each other but do not force into place.
- Install batt or blanket ceiling insulation BEFORE the tile backer boards on ceilings. Install the insulation IMMEDIATELY after the panels when using loose fill insulation. Avoid installation practices that might allow condensation to form behind panels.
- When used as a tile substrate for ceilings, apply panels perpendicular to the supports spaced a maximum of 12 in. (305 mm) o.c. for 1/2 in. (12.7 mm) and 16 in. (406 mm) o.c. for 5/8 in. (15.9 mm). Space fasteners 8 in. (203 mm) o.c. along all support members.

WALLS

- Locate gypsum panel joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Install tile backer boards either horizontally or vertically to framing using fasteners every 8 in. (203 mm) o.c. When applying tile, use minimum 20-gauge steel or wood framing spaced 16 in. (406 mm) o.c. without blocking, or 24 in. (610 mm) o.c. with blocking at all joints for 1/2 in. (12.7 mm), and spaced 24 in. (610 mm) o.c. for 5/8 in. (15.9 mm).

COUNTERTOPS

- Apply EXP® Tile Backer over a minimum 23/32 in. (18.3 mm) exterior-grade plywood sub-base using a bed of thin-set mortar applied with a 1/4 in. (6.4 mm) x 1/4 in. (6.4 mm) notched trowel between the plywood and EXP Tile Backer. Fasten using 1-1/4 in. (31.8 mm) long corrosion-resistant roofing nails or coarse thread bugle-head screws spaced no more than 8 in. (203 mm) o.c. in both directions.

PENETRATIONS

- Caulk or seal fixture or plumbing penetrations and abutments to dissimilar materials.

SAFETY

Installers should wear long pants and a long-sleeved, loose fitting shirt. Use protective gloves and special eye protection (goggles or safety glasses with side shield). Wear a dust mask when sanding; you may need additional breathing protection in extremely dusty conditions. Do not use a power saw to cut this product.

Caution: Because this product contains fiberglass, dust and glass fibers may be released during normal handling, which could result in eye or skin irritation or cause difficulty in breathing. Whenever possible, avoid contact with the skin and eyes and avoid breathing dust or fibers that may be released during installation. Consult the SDS for this product, available at purplechoice.info before use.

Finishing**TILE APPLICATION OVER EXP TILE BACKER**

Tile can be set using either thin-set mortar (ANSI A118.1 or A118.4) or organic adhesive (ANSI A136.1). Embed alkali-resistant fiberglass tape with the tile-setting material prior to tile installation. Install using manufacturer's instructions. Allow tile-setting material to cure for a day prior to grout application.

NON-TILE APPLICATION OVER EXP TILE BACKER

Dry Non-Tile Applications: Outside the wet areas of showers and baths, tape joints with gypsum board tape and embed with setting tape joint compound, such as ProForm® BRAND Quick Set™ Setting Compound. Skim the entire surface with a joint compound to create a smooth surface for finishing. Use setting compound or all-purpose ready mix joint compound for skim coat.

HIGH HUMID AREA APPLICATIONS

For areas of higher than normal humidity, such as swimming pools and process facilities, finish the walls with materials suitable for humid environments, such as direct-applied finish systems. Caulk all transitions and abutments to dissimilar materials with a flexible caulk. Seal all penetrations, including outlets and switches.

**COUNTERTOP
INSTALLATION**

- 1. Plywood
- 2. EXP® Tile Backer
- 3. Fiberglass Mesh Tape (Alkali-Resistant) Embedded in Joint Compound
- 4. Latex-Portland Cement Mortar
- 5. Tile and Grout



**SHOWER
INSTALLATION**

- 1. Support Framing
- 1/4" / 12" slope toward drain
- 2. Plywood, Min. 1/2"
- 3. Membrane
- 4. EXP® Tile Backer
- 5. Membrane
- 6. Sealant
- 7. Latex-Portland Cement Mortar
- 8. Tile and Grout



EXP® Panels

Limitations

- For interior use only.
- Always apply tile/finishes to the gray acrylic face.
- Treat joints under tile with alkali-resistant fiberglass mesh tape set in thin-set mortar or tile adhesive.
- Do not use conventional paper gypsum board tape, joint compound, gypsum board nails and gypsum board screws in wet areas.
- Do not use on floor installations.
- Do not use in shower pans or shower curbs.
- Do not use as a base for nailing and mechanical fastening.
- Do not expose to temperatures exceeding 125°F (52°C).
- Avoid continuous exposure to extreme conditions in applications such as saunas, steam rooms and radiant barriers at fireplaces; use PermaBase® BRAND Cement Board for these applications.
- Do not install a vapor barrier directly behind tiled EXP® Tile Backer. Consult your local building code for vapor barrier requirements.
- Do not apply EXP Tile Backer directly to concrete or masonry block.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.

eXP® Interior Extreme®

Gypsum Panels

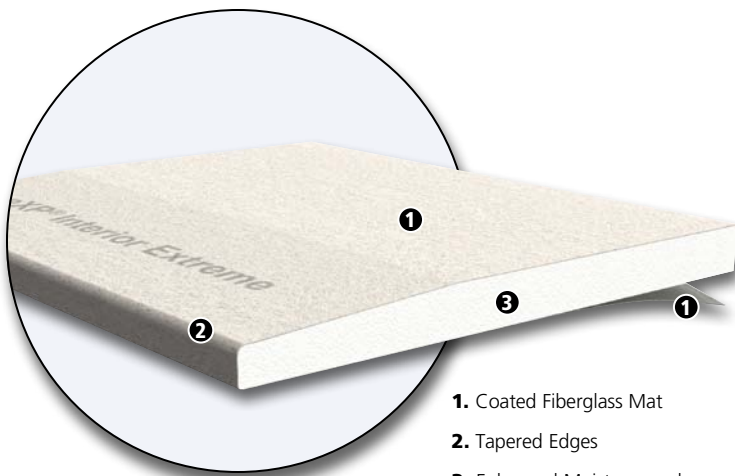
PURPLE 
EVOLVE YOUR WALLS™

Gold Bond® BRAND eXP® Interior Extreme® Gypsum Panels consist of a moisture- and mold-resistant gypsum core encased in a coated, specially designed fiberglass mat on the face, back and sides. It is available in a Regular, Type X or Type C core (often specified where the weight and number of gypsum board layers are a concern). The glass mat is folded around the long edges to reinforce and protect the core.

Use it wherever gypsum board is specified in interior applications for the entire project, wood or metal framing, for increased resistance to incidental moisture.

Sizes: 1/2 in. (12.7 mm) thick Regular Panels, 1/2 in. (12.7 mm) thick Type C Panels and 5/8 in. (15.9 mm) thick Type X or Type C Panels are available in 4 ft. (1,219 mm) widths and in standard lengths of 8 ft. (2,438 mm) to 12 ft. (3,658 mm).

Finishing: Tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set™ Setting Compounds.



1. Coated Fiberglass Mat
2. Tapered Edges
3. Enhanced Moisture- and Mold-Resistant Gypsum Core

Gold Bond® BRAND
eXP®
Interior Extreme®

eXP® Panels

National 
Gypsum®

Basic Uses

APPLICATIONS

- Use it in both wood- and metal-framed construction for interior wall and ceiling finishing to provide increased moisture and mold resistance.
- Use it on the interior side of exterior walls, mechanical rooms and core walls where moisture exposure is more likely. Also approved for use in protected exterior soffit applications.
- Can use for pre-rock applications before the building is completely enclosed, which may shorten construction cycles.

ADVANTAGES

- Versatile product can be used throughout entire project wherever gypsum board is specified.
- May use for pre-rock applications before building is completely enclosed, which may speed installation.
- Resists the growth of mold per ASTM D3273 with a score of 10, the best possible score.
- Coated fiberglass facers for easy handling.
- Scores and snaps easily without sawing.
- Offers a 12-month extended exposure warranty for typical weather conditions. Refer to National Gypsum Company limited warranties for further details.
- Features the GridMarX® guide marks on the panel to allow for faster and accurate installation.
- 1/2 in. (12.7 mm) Fire-Shield® C, 5/8 in. (15.9 mm) Fire-Shield® Type X or Type C have specially formulated cores that are approved components in specific UL fire-rated designs.
- Achieves GREENGUARD Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.

Installation Recommendations

GENERAL

- Install gypsum panels in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum panels are to be applied. Remedy all defects prior to installation of the gypsum panel.
- Apply gypsum panels first to ceilings at right angles to framing members, then to walls. Use panels of maximum practical length so that the minimum number of end joints occur. Panel edges should be brought into contact with each other but not forced into place.
- Install batt or blanket ceiling insulation BEFORE the gypsum panels on ceilings when installing a polyethylene vapor barrier on ceilings behind the gypsum panels. Install the insulation IMMEDIATELY after the gypsum panels when using loose fill insulation. Avoid installation practices that allow condensation to form behind panels.
- Locate gypsum board joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Hold gypsum panels in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the panels toward the edges and ends. Set fasteners with heads slightly below the surface of the panels. Take care to avoid breaking the glass mat facer of the gypsum panel. Remove improperly driven nails or screws.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum panels.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the gypsum panels and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.

TECHNICAL DATA

PHYSICAL PROPERTIES				
	EXP Interior Extreme	1/2" EXP Interior Extreme Type C	5/8" EXP Interior Extreme Type X	5/8" EXP Interior Extreme Type C
Thickness¹, Nominal	1/2" (12.7 mm)	1/2" (12.7 mm)	5/8" (15.9 mm)	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm)	4' (1,219 mm)	4' (1,219 mm)	4' (1,219 mm)
Length^{1,4}, Standard	8' – 12' (2,438 mm – 3,658 mm)	8' – 12' (2,438 mm – 3,658 mm)	8' – 12' (2,438 mm – 3,658 mm)	8' – 12' (2,438 mm – 3,658 mm)
Weight, Nominal	2.0 lbs. / sq. ft. (9.76 k/m ²)	2.1 lbs. / sq. ft. (10.25 k/m ²)	2.5 lbs. / sq. ft. (12.21 k/m ²)	2.5 lbs. / sq. ft. (12.21 k/m ²)
Edges¹	Tapered	Tapered	Tapered	Tapered
Flexural Strength¹, Perpendicular	≥ 100 lbf. (445 N)	≥ 100 lbf. (445 N)	≥ 140 lbf. (623 N)	≥ 140 lbf. (623 N)
Flexural Strength¹, Parallel	≥ 80 lbf. (356 N)	≥ 80 lbf. (356 N)	≥ 100 lbf. (445 N)	≥ 100 lbf. (445 N)
Humidified Deflection¹	≤ 5/16" (7.9 mm)	≤ 5/16" (7.9 mm)	≤ 4/16" (6.4 mm)	≤ 4/16" (6.4 mm)
Nail Pull Resistance¹	≥ 80 lbf. (356 N)	≥ 80 lbf. (356 N)	≥ 90 lbf. (400 N)	≥ 90 lbf. (400 N)
Hardness¹ – Core, Edges and Ends	≥ 15 lbf. (67 N)	≥ 15 lbf. (67 N)	≥ 15 lbf. (67 N)	≥ 15 lbf. (67 N)
Bending Radius	6' (1,829 mm)	6' (1,829 mm)	8' (2,438 mm)	8' (2,438 mm)
Thermal Resistance⁵	R = .43	R = .43	R = .50	R = .50
Permeance⁶	22 perms	22 perms	19 perms	19 perms
Water Absorption¹ (% of Weight)	≤ 5%	≤ 5%	≤ 5%	≤ 5%
Surface Water Absorption¹	≤ 1.6 grams	≤ 1.6 grams	≤ 1.6 grams	≤ 1.6 grams
Linear Expansion with Change Moisture	6.25 x 10 ⁻⁶ in./in./%RH	6.25 x 10 ⁻⁶ in./in./%RH	6.25 x 10 ⁻⁶ in./in./%RH	6.25 x 10 ⁻⁶ in./in./%RH
Coefficient of Thermal Expansion	9.26 x 10 ⁻⁶ in./in./°F	9.26 x 10 ⁻⁶ in./in./°F	9.26 x 10 ⁻⁶ in./in./°F	9.26 x 10 ⁻⁶ in./in./°F
Mold Resistance⁷, ASTM D3273	Score of 10	Score of 10	Score of 10	Score of 10
Mold Resistance⁸, ASTM D6329	Yes	Yes	Yes	Yes
Product Standard Compliance	ASTM C1658	ASTM C1658	ASTM C1658	ASTM C1658
Fire-Resistance Characteristics				
Core Type	Regular	Type C	Type X	Type C
UL Type Designation	N/A	EXP-C	FSW-6	EXP-C
Combustibility²	Non-combustible Core	Non-combustible Core	Non-combustible Core	Non-combustible Core
Surface Burning Characteristics³	Class A	Class A	Class A	Class A
Flame Spread³	0	0	0	0
Smoke Development³	0	0	0	0
Applicable Standards and References				
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products				
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus				
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board				
ASTM C1658 Standard Specification for Glass Mat Gypsum Panels				
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber				
ASTM D6329 Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers				
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials				
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials				
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C				
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>				
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>				
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>				
National Gypsum Company, <i>NGC Construction Guide</i>				

1. Specified values per ASTM C1658, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

6. Tested in accordance with ASTM E96.

7. Tested in accordance with ASTM D3273.

8. Tested in accordance with ASTM D6329.

- Install fire-rated assemblies in accordance with the details found in the *UL Fire Resistance Directory* or the Gypsum Association's GA-600, *Fire-Resistance Design Manual*.
- Drive fasteners just below the surface, avoiding damage to the core and/or glass mat facer.
- Avoid installing water-sensitive materials on EXP® Interior Extreme® Panels in pre-rock applications until the building is enclosed.

FINISHING

Perform finishing of EXP Interior Extreme Panels in accordance with GA-214. Joints between EXP Interior Extreme Panels may be finished with either paper tape and ready mix joint compound or fiberglass mesh tape and setting compound, such as ProForm® BRAND Interior Finishing Products. In most areas to receive final decoration, skim coating of the entire surface is recommended.

DECORATION

Ensure gypsum panel surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

Prepare and prime gypsum panels prior to decoration.

Refer to GA-214 to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

SAFETY

Installers should wear long pants and a long-sleeved, loose fitting shirt. Use protective gloves and special eye protection (goggles or safety glasses with side shield). Wear a dust mask when sanding; you may need additional breathing protection in extremely dusty conditions. Do not use a power saw to cut this product.

Caution: Because this product contains fiberglass, dust and glass fibers may be released during normal handling, which could result in eye or skin irritation or cause difficulty in breathing. Whenever possible, avoid contact with the skin and eyes and avoid breathing dust or fibers that may be released during installation. Consult the SDS for this product, available at: purplechoice.info before use.

Limitations

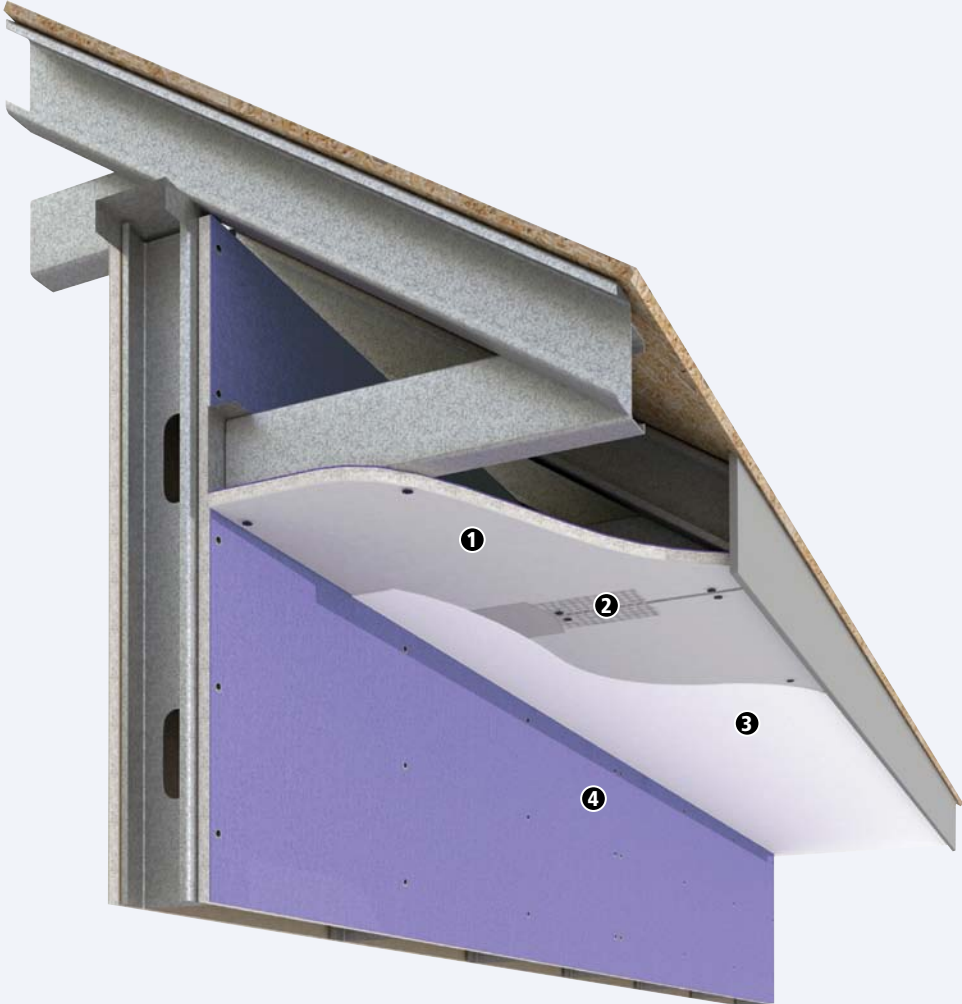
- Do not use for exposed exterior applications. EXP Interior Extreme Panels are intended for interior applications or projects.
- Do not use panels as a nailing base as they are nonstructural.
- Avoid exposure to excessive or continuous moisture and extreme temperatures. Gypsum panels are not recommended where they will be exposed to temperatures exceeding 125°F (52°C) for extended periods of time.
- Avoid using in areas subject to constant and/or excessive moisture and high humidity, such as gang showers, saunas, steam rooms or swimming pool enclosures.
- Avoid using as a backer board directly behind tile in tub and shower areas.
- Do not install in horizontal applications until the building is properly enclosed.
- Do not finish joints until building is properly enclosed.

CRITICAL LIGHTING AREAS

Wall and ceiling areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal even minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum panel board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paints and dark-toned paint finishes highlight surface defects; consider the use of textures to hide these minor visual imperfections. Finish panels to a Level 5 finish as outlined in GA-214.

EXTERIOR SOFFIT INSTALLATION

- 1. EXP® Interior Extreme® Gypsum Board
- 2. Mesh Tape Set in Compound
- 3. Skim Coat
- 4. EXP® Sheathing



EXP® Panels

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.

eXP® Interior Extreme® AR

Gypsum Panels

PURPLE 
EVOLVE YOUR WALLS™

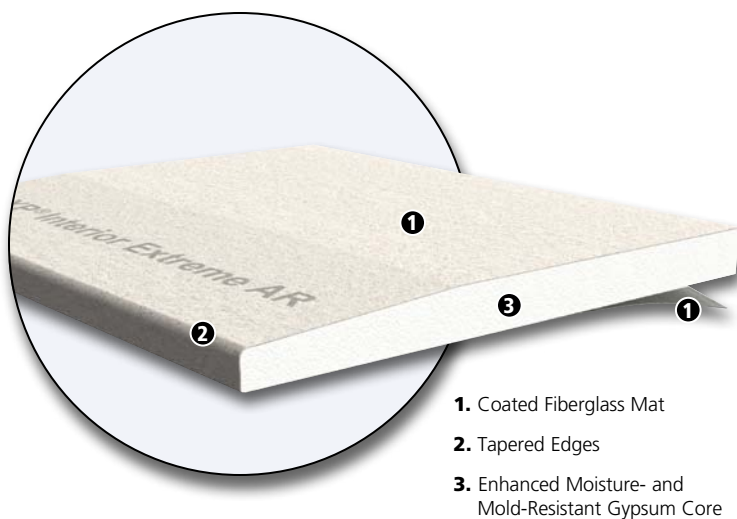
Gold Bond® BRAND eXP® Interior Extreme® Abuse Resistant (AR) Gypsum Panels consist of an abuse- and moisture- and mold-resistant gypsum core encased in a coated, specially designed fiberglass mat on the face, back and sides. In addition to moisture and mold resistance, the AR Panel has a denser core and an enhanced glass mat for increased resistance to indentation and abrasion. It is available in a Type X core. The glass mat is folded around the long edges to reinforce and protect the core.

Use it for interior applications in areas prone to surface abrasion and indentation, including corridors, entryways, lobby areas and warehouses.

For speed of installation, GridMarX® guide marks are printed on the glass mat surface.

Sizes: 5/8 in. (15.9 mm) thick Type X Panels are available in 4 ft. (1,219 mm) widths and in standard lengths of 8 ft. (2,438 mm) to 12 ft. (3,658 mm).

Finishing: Tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set™ Setting Compounds.



1. Coated Fiberglass Mat
2. Tapered Edges
3. Enhanced Moisture- and Mold-Resistant Gypsum Core

Gold Bond® BRAND
eXP®
Interior Extreme® AR

eXP® Panels

National 
Gypsum®

Note: For abuse and impact test (ASTM C1629) results, see page 388.

Basic Uses

APPLICATIONS

- Use it for interior wall and ceiling assemblies in areas where surface abrasion, indentation and moisture, mold and mildew resistance are major concerns.
- Use it on the interior side of exterior walls, mechanical rooms and core walls where moisture exposure is more likely.
- Use it for pre-rock applications before the building is completely enclosed, which may shorten construction cycles.

ADVANTAGES

- Provides greater resistance to surface abuse and impact penetration over standard gypsum board.
- Approved component in specific UL fire-rated designs.
- Resists the growth of mold per ASTM D3273 with a score of 10, the best possible score.
- Coated fiberglass facers for easy handling.
- Offers a 12-month extended exposure warranty for typical weather conditions. Refer to National Gypsum Company limited warranties for further details.
- Features the GridMarX® preprinted fastening guide on the panel to allow for faster and more accurate installation.
- Achieves GREENGUARD Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.

Installation Recommendations

GENERAL

- Install gypsum panels in accordance with methods described in ASTM C840 and GA-216. Note that cutting and scoring should be from the back side of the panels.
- Examine and inspect framing materials to which gypsum panels are to be applied. Remedy all defects prior to installation of the gypsum panel.
- Apply gypsum panels first to ceilings at right angles to framing members, then to walls. Use panels of maximum practical length so that the minimum number of end joints occur. Panel edges should be brought into contact with each other but do not force into place.
- Install batt or blanket ceiling insulation BEFORE the gypsum panels on ceilings when installing a vapor retarder behind the gypsum panels. Install the insulation IMMEDIATELY after the gypsum panels when using loose fill insulation. Avoid installation practices that allow condensation to form behind panels.
- Locate gypsum panel joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Hold gypsum panels in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the panels toward the edges and ends. Set fasteners with heads slightly below the surface of the panels. Take care to avoid breaking the glass mat facer of the gypsum panel. Remove improperly driven nails or screws.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum panels.

TECHNICAL DATA

PHYSICAL PROPERTIES	
	EXP Interior Extreme AR
Thickness¹, Nominal	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm)
Length^{1,4}, Standard	8' – 12' (2,438 mm – 3,658 mm)
Weight, Nominal	2.8 lbs. / sq. ft. (13.67 k/m ²)
Edges¹	Tapered
Flexural Strength¹, Perpendicular	≥ 140 lbf. (623 N)
Flexural Strength¹, Parallel	≥ 100 lbf. (445 N)
Humidified Deflection¹	≤ 4/16" (6.4 mm)
Nail Pull Resistance¹	≥ 90 lbf. (400 N)
Hardness¹ – Core, Edges and Ends	≥ 15 lbf. (67 N)
Bending Radius	8' (2,438 mm)
Thermal Resistance⁵	R = .50
Permeance⁶	19 perms
Water Absorption¹ (% of Weight)	≤ 5%
Surface Water Absorption¹	≤ 1.6 grams
Linear Expansion with Change Moisture	6.25 x 10 ⁻⁶ in./in./%RH
Coefficient of Thermal Expansion	9.26 x 10 ⁻⁶ in./in./°F
Mold Resistance⁷, ASTM D3273	Score of 10
Surface Abrasion⁸	Level 3
Indentation⁸	Level 1
Soft-Body Impact⁸	Level 2
Hard-Body Impact⁸	Level 1
Product Standard Compliance	ASTM C1658
Fire-Resistance Characteristics	
Core Type	Type X
UL Type Designation	FSW-6
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	0
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1629 Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels	
ASTM C1658 Standard Specification for Glass Mat Gypsum Panels	
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>	
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>	
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1658, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths.

Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

6. Tested in accordance with ASTM E96.

7. Tested in accordance with ASTM D3273.

8. Tested in accordance with ASTM methods in ASTM C1629 – D4977 (Surface Abrasion), D5420 (Indentation), E695 (Soft-Body Impact), Annex A1 (Hard-Body Impact). Refer to page 388.

- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the gypsum panels and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.
- Listed impact ratings apply to walls constructed with EXP® Interior Extreme® AR applied with long edges parallel to and centered over minimum 20-gauge framing members spaced a maximum of 16 in. (406 mm) o.c.
- Install fire-rated assemblies in accordance with the details found in the *UL Fire Resistance Directory* or the Gypsum Association's GA-600, *Fire-Resistance Design Manual*.
- Drive fasteners just below the surface, avoiding damage to the core and/or glass mat facer.
- Avoid installing water-sensitive materials adjacent to EXP Interior Extreme Panels in pre-rock applications until the building is enclosed.

FINISHING

Perform finishing of EXP Interior Extreme AR Gypsum Panels in accordance with GA-214. Joints between EXP Interior Extreme AR Panels may be finished with either paper tape and ready mix joint compound or fiberglass mesh tape and setting compound, such as ProForm® BRAND Interior Finishing Products. In most areas to receive final decoration, skim coating of the entire surface is recommended.

DECORATION

Ensure gypsum panel surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

Prepare and prime gypsum panels prior to decoration.

Refer to GA-214 to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

SAFETY

Installers should wear long pants and a long-sleeved, loose fitting shirt. Use protective gloves and special eye protection (goggles or safety glasses with side shield). Wear a dust mask when sanding; you may need additional breathing protection in extremely dusty conditions. Do not use a power saw to cut this product.

Caution: Because this product contains fiberglass, dust and glass fibers may be released during normal handling, which could result in eye or skin irritation or cause difficulty in breathing. Whenever possible, avoid contact with the skin and eyes and avoid breathing dust or fibers that may be released during installation. Consult the SDS for this product, available at purplechoice.info before use.

CRITICAL LIGHTING AREAS

Wall and ceiling areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paints and dark-toned paint finishes highlight surface defects; consider the use of textures to hide these minor visual imperfections. Finish panels to a Level 5 finish as outlined in GA-214.

Limitations

- Do not use for exterior applications. EXP® Interior Extreme® AR Gypsum Panels are intended for interior use only.
- Do not use panels as a nailing base as they are nonstructural.
- Do not finish joints until building is properly enclosed.
- Avoid exposure to excessive or continuous moisture and extreme temperatures. Gypsum board is not recommended where it will be exposed to temperatures exceeding 125°F (52°C) for extended periods of time.
- Avoid using in areas subject to constant and/or excessive moisture and high humidity, such as gang showers, saunas, steam rooms or swimming pool enclosures.
- Avoid using as a backer board directly behind tile in tub and shower areas.
- Do not install in horizontal applications until the building is properly enclosed.
- To maximize impact resistance and eliminate potential screw spin-out, a minimum 20-gauge (.0312 in. design thickness) steel stud is required.
- Space supporting framing a maximum of 16 in. (406 mm) o.c.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.

eXP® Interior Extreme® IR

Gypsum Panels

PURPLE 
EVOLVE YOUR WALLS™

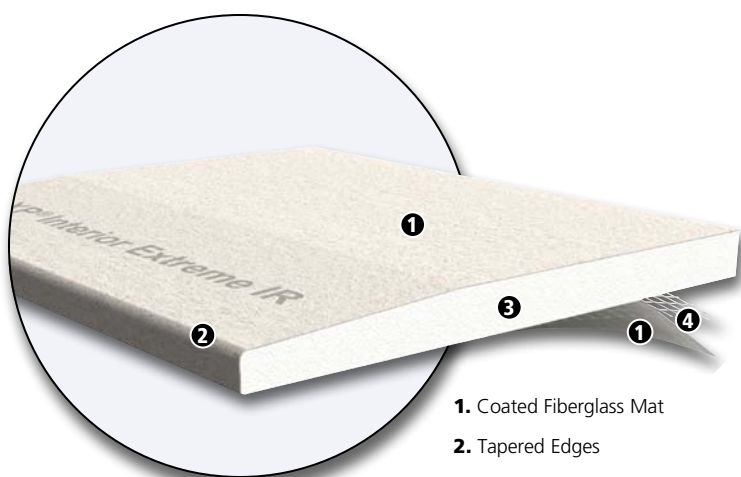
Gold Bond® BRAND EXP® Interior Extreme® Impact Resistant (IR) Gypsum Panels consist of an impact- and moisture- and mold-resistant gypsum core encased in a coated, specially designed fiberglass mat on the face, back and sides. In addition to moisture and mold resistance, the impact-resistant panel has a denser core and an enhanced glass mat for increased resistance to indentation and impact. Additionally, the fiberglass mesh embedded into the core enhances impact resistance. It is available in a Type X core. The glass mat is folded around the long edges to reinforce and protect the core.

Use it for interior applications requiring increased resistance to incidental moisture and wall penetrations. It is ideal for areas prone to cavity penetration, including gymnasiums, correctional facilities, schools and workshops.

For speed of installation, GridMarX® guide marks are printed on the glass mat surface.

Sizes: 5/8 in. (15.9 mm) thick Type X Panels are available in 4 ft. (1,219 mm) widths and in standard lengths of 8 ft. (2,348 mm) to 12 ft. (3,658 mm).

Finishing: Tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set™ Setting Compounds.



1. Coated Fiberglass Mat
2. Tapered Edges
3. Enhanced Moisture- and Mold-Resistant Gypsum Core
4. Fiberglass Mesh

Gold Bond® BRAND
eXP®
Interior Extreme® IR

National 
Gypsum®

Note: For abuse and impact test (ASTM C1629) results, see page 388.

Basic Uses

APPLICATIONS

- Use in wall assemblies in areas where surface abrasion, impact or penetration and moisture, mold and mildew resistance are major concerns.
- Use on the interior side of exterior walls, mechanical rooms and core walls where moisture exposure is more likely.
- Use for pre-rock applications before the building is completely enclosed, which may shorten construction cycles.

ADVANTAGES

- Provides greater resistance to abuse and impact penetration over standard gypsum board.
- Approved component in specific UL fire-rated designs.
- Resists the growth of mold per ASTM D3273 with a score of 10, the best possible score.
- Coated fiberglass facers for easy handling.
- Offers a 12-month extended exposure warranty for typical weather conditions. Refer to National Gypsum Company limited warranties for further details.
- Features the GridMarX® preprinted fastening guide on the panel to allow for faster and more accurate installation.
- Achieves GREENGUARD Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.

Installation Recommendations

GENERAL

- Install gypsum panels in accordance with methods described in ASTM C840 and GA-216. Note that cutting and scoring should be from the back side of the panels.
- Examine and inspect framing materials to which gypsum panels are to be applied. Remedy all defects prior to installation of the gypsum board.
- Apply gypsum panels first to ceilings at right angles to framing members, then to walls. Use boards of maximum practical length so that the minimum number of end joints occur. Bring panel edges into contact with each other but do not force into place.
- Install batt or blanket ceiling insulation BEFORE the gypsum panels on ceilings when installing a vapor retarder behind the gypsum panels. Install the insulation IMMEDIATELY after the gypsum panels when using loose fill insulation. Avoid installation practices that might allow condensation to form behind panels.
- Locate gypsum panel joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Hold gypsum panels in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the panels toward the edges and ends. Set fasteners with heads slightly below the surface of the panels. Take care to avoid breaking the glass mat facer of the gypsum panel. Remove improperly driven nails or screws.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum panels.

TECHNICAL DATA

PHYSICAL PROPERTIES	
	EXP Interior Extreme IR
Thickness¹, Nominal	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm)
Length^{1,4}, Standard	8' – 12' (2,438 mm – 3,658 mm)
Weight, Nominal	2.8 lbs. / sq. ft. (13.67 k/m ²)
Edges¹	Tapered
Flexural Strength¹, Perpendicular	≥ 140 lbf. (623 N)
Flexural Strength¹, Parallel	≥ 100 lbf. (445 N)
Humidified Deflection¹	≤ 4/16" (6.4 mm)
Nail Pull Resistance¹	≥ 90 lbf. (400 N)
Hardness¹ – Core, Edges and Ends	≥ 15 lbf. (67 N)
Bending Radius	8' (2,438 mm)
Thermal Resistance⁵	R = .50
Permeance⁶	19 perms
Water Absorption¹ (% of Weight)	≤ 5%
Surface Water Absorption¹	≤ 1.6 grams
Linear Expansion with Change Moisture	6.25 x 10 ⁻⁶ in./in./%RH
Coefficient of Thermal Expansion	9.26 x 10 ⁻⁶ in./in./°F
Mold Resistance⁷, ASTM D3273	Score of 10
Surface Abrasion⁸	Level 3
Indentation⁸	Level 1
Soft-Body Impact⁸	Level 3
Hard-Body Impact⁸	Level 2
Product Standard Compliance	ASTM C1658
Fire-Resistance Characteristics	
Core Type	Type X
UL Type Designation	FSW-6
Combustibility²	Non-combustible Core
Surface Burning Characteristics³	Class A
Flame Spread³	0
Smoke Development³	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1629 Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels	
ASTM C1658 Standard Specification for Glass Mat Gypsum Panels	
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	
Gypsum Association, GA-214, <i>Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels</i>	
Gypsum Association, GA-216, <i>Application and Finishing of Gypsum Panel Products</i>	
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1658, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Please consult your local sales representative for all non-standard lengths and widths.

Minimum order requirements may apply.

5. Tested in accordance with ASTM C518.

6. Tested in accordance with ASTM E96.

7. Tested in accordance with ASTM D3273.

8. Tested in accordance with ASTM methods in ASTM C1629 – D4977 (Surface Abrasion), D5420 (Indentation), E695 (Soft-Body Impact), Annex A1 (Hard-Body Impact). Refer to page 388.

- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the gypsum panels and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.
- Listed impact ratings apply to walls constructed with EXP® Interior Extreme® IR applied with long edges parallel to and centered over minimum 20-gauge framing members spaced a maximum of 16 in. (406 mm) o.c.
- Install fire-rated assemblies in accordance with the details found in the *UL Fire Resistance Directory* or the Gypsum Association's GA-600, *Fire Resistance Design Manual*.
- Drive fasteners just below the surface, avoiding damage to the core and/or glass mat facer.
- Avoid installing water-sensitive materials adjacent to EXP Interior Extreme Panels in pre-rock applications until the building is enclosed.

FINISHING

Perform finishing of EXP Interior Extreme IR Panels in accordance with GA-214. Joints between EXP Interior Extreme IR Panels may be finished with either paper tape and ready mix joint compound or fiberglass mesh tape and setting compound, such as ProForm® BRAND Interior Finishing Products. In most areas to receive final decoration, skim coating of the entire surface is recommended.

DECORATION

Ensure gypsum panel surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality drywall primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

Prepare and prime gypsum panels prior to decoration.

Refer to GA-214 to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

SAFETY

Installers should wear long pants and a long-sleeved, loose fitting shirt. Use protective gloves and special eye protection (goggles or safety glasses with side shield). Wear a dust mask when sanding; you may need additional breathing protection in extremely dusty conditions. Do not use a power saw to cut this product.

Caution: Because this product contains fiberglass, dust and glass fibers may be released during normal handling, which could result in eye or skin irritation or cause difficulty in breathing. Whenever possible, avoid contact with the skin and eyes and avoid breathing dust or fibers that may be released during installation. Consult the SDS for this product, available at purplechoice.info before use.

CRITICAL LIGHTING AREAS

Wall and ceiling areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum panel surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paints and dark-toned paint finishes highlight surface defects; consider the use of textures to hide these minor visual imperfections. Finish panels to a Level 5 finish as outlined in GA-214.

Limitations

- Do not use for exterior applications. EXP® Interior Extreme® IR Panels are intended for interior use only.
- Do not use panels as a nailing base as they are nonstructural.
- Do not finish joints until building is properly enclosed.
- Avoid exposure to excessive or continuous moisture and extreme temperatures. Gypsum board is not recommended where it will be exposed to temperatures exceeding 125°F (52°C) for extended periods of time.
- Avoid using in areas subject to constant and/or excessive moisture and high humidity, such as gang showers, saunas, steam rooms or swimming pool enclosures.
- Avoid using as a backer board directly behind tile in tub and shower areas.
- Do not install in horizontal applications until the building is properly enclosed.
- To maximize impact resistance and eliminate potential screw spin-out, a minimum 20-gauge (.0312 in. design thickness) steel stud is required.
- Space supporting framing a maximum of 16 in. (406 mm) o.c.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.

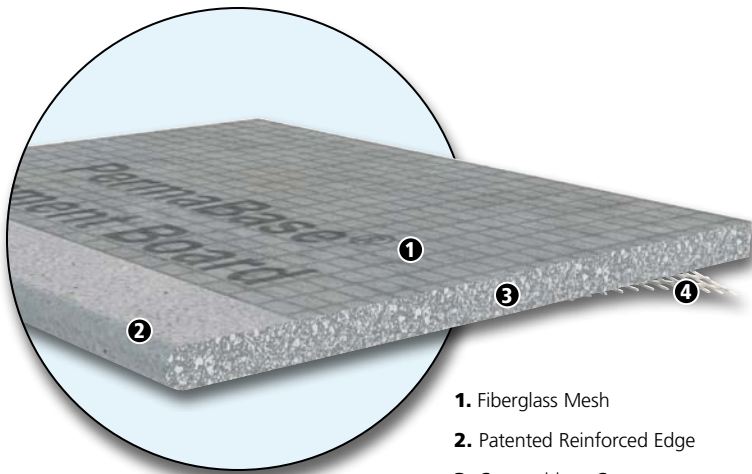
Cement Board

1/2 in. (12.7 mm) and 5/8 in. (15.9 mm)

PermaBase® BRAND Cement Board is a rigid substrate made of Portland cement, aggregate and glass mesh. It has an exceptionally hard, durable surface that can withstand prolonged exposure to moisture.

Use it as an underlayment or backing surface in a variety of interior and exterior applications, including (but not limited to) tub and shower surrounds, countertops, flooring, and for cement board stucco and masonry veneer wall systems.

Sizes: 1/2 in. (12.7 mm) and 5/8 in. (15.9 mm) thick cement boards are available in 32 in. (813 mm), 36 in. (914 mm) and 48 in. (1,219 mm) widths and in standard lengths of 4 ft. (1,219 mm), 5 ft. (1,524 mm), 6 ft. (1,829 mm) and 8 ft. (2,438 mm). For details about sizes, refer to the chart on page 231.



1. Fiberglass Mesh
2. Patented Reinforced Edge
3. Cementitious Core
4. Fiberglass Mesh

Perma
BASE
BRAND
Cement Board

National
Gypsum

Basic Uses

APPLICATIONS

Interior

PermaBase® Cement Board is a superior underlayment for many interior applications, including kitchen countertops and backsplashes; bathroom shower and tub enclosures, garden and whirlpool tubs, and steamrooms and saunas; flooring for kitchens, bathrooms, entryways, foyers and laundry rooms; walls for bathrooms, accent areas and fireplaces; and special additions, such as swimming pool and whirlpool decks and enclosures.

Exterior

PermaBase provides an excellent substrate for many in-demand exterior applications, including Cement Board Masonry Veneer Wall System (CBMV), Cement Board Stucco System (CBSS), Continuous Insulation (CI), and Exterior Insulation and Finish Systems (EIFS). PermaBase allows the combination of exterior finishes on one continuous wall sheathing, providing greater design flexibility. It works well for commercial exteriors, residential exteriors, outdoor kitchens and decks.

Cement Board Stucco Wall System (CBSS)

For use in residential and low-rise commercial applications, CBSS provides a drainage system to help prevent water from penetrating behind cladding in framed construction. It complies with ASTM D226, protecting approved sheathings/structural components and helping to evacuate incidental water.

Cement Board Masonry Veneer Wall System (CBMV)

For use in residential and low-rise commercial applications, CBMV offers a complete, engineered solution for installation of adhered veneers. It provides the ability to incorporate an effective water-management system for a variety of building exteriors with manufactured or natural stone and thin brick veneers.

Continuous Insulation

For use in residential and low-rise commercial applications, Continuous Insulation offers a complete, engineered solution for required structural performance. Including PermaBase as a component in this system reinforces the building and provides the ability to incorporate an effective water-management system.

ADVANTAGES

- Allows for closer fastener application of nails or screws at the edge without crumbling or spinout – reinforced with patented EdgeTech® Technology.
- Use as a substrate for direct-applied finishes, tile, stone and thin brick in exterior applications (as outlined in ICC-ES Evaluation Report ESR-1510).
- Use in combustible and non-combustible construction under the IBC and IRC (as outlined in ICC-ES Evaluation Report ESR-1510).
- Resists the growth of mold per ASTM D3273 with a score of 10, the best possible score.
- Can be cut using a standard utility knife and straightedge. With the unique PermaBase core composition, little or no additional labor is needed to clean the edge after a cut.
- Is impact resistant, extremely durable and dimensionally stable. It has excellent overall flexural, compressive and tensile strength characteristics.

TECHNICAL DATA

PHYSICAL PROPERTIES		
	1/2" PermaBase	5/8" PermaBase
Thickness¹, Nominal	1/2" (12.7 mm)	5/8" (15.9 mm)
Weight, Nominal	2.9 lbs. / sq. ft. (14.2 k/m ²)	3.65 lbs. / sq. ft. (17.8 k/m ²)
Edges	Round	Round
Flexural Strength⁸	≥ 750 psi	≥ 750 psi
Fastener Holding⁷ (Wet and Dry)	≥ 90 lbs.	≥ 90 lbs.
Freeze/Thaw Cycles¹⁰	100	100
Compressive Strength¹¹	2,250 psi	2,250 psi
Wind Load¹² (Studs 16" o.c.)	40 psf	40 psf
Bending Radius	5' (1,524 mm)	5' (1,524 mm)
Thermal Resistance³	R = .37, K = 2.7	R = .47, K = 2.7
Permeance⁴	> 10 perms	> 10 perms
Water Absorption⁹ (% of Weight)	< 8%	< 8%
Falling Ball Impact⁷ (12" drop)	Pass	Pass
Linear Expansion with Change Moisture⁷	≤ 0.07%	≤ 0.07%
Mold Resistance⁵ (ASTM D3273)	Score of 10	Score of 10
Mold Resistant⁶ (ASTM G21)	Score of 0	Score of 0
Product Standard Compliance	ASTM C1325	ASTM C1325
Fire-Resistance Characteristics		
Core Type	N/A	N/A
UL Type Designation	PermaBase	PermaBase
Surface Burning Characteristics²	Class A	Class A
Flame Spread²	0	0
Smoke Development²	0	0
Applicable Standards and References		
ASTM A118.9 Test Methods and Specification for Cementitious Backer Units		
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products		
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus		
ASTM C666 Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing		
ASTM C947 Standard Test Method for Flexural Properties of Thin-Section Glass-Fiber-Reinforced Concrete (Using Simple Beam with Third-Point Loading)		
ASTM C1325 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing		
ASTM D1037 Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials		
ASTM D2394 Standard Test Methods for Simulated Service Testing of Wood and Wood-Base Finish Flooring		
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber		
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials		
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials		
ASTM E330 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference		
ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi		
National Gypsum Company, <i>NGC Construction Guide</i>		

1. Specified values per ASTM C1325, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E84.

3. Tested in accordance with ASTM C518.

4. Tested in accordance with ASTM E96.

5. Tested in accordance with ASTM D3273.

6. Tested in accordance with ASTM G21.

7. Specified values per ASTM C1325, tested in accordance with ASTM D1037.

8. Specified values per ASTM C1325, tested in accordance with ASTM C947.

9. Tested in accordance with ASTM C473, 24-hour immersion.

10. Per ANSI A118.9 procedure B. Tested in accordance with ASTM C666.

11. Tested in accordance with ASTM D2394.

12. Tested in accordance with ASTM E330.

- Is highly moisture resistant, and will not rot, disintegrate or swell when exposed to water.
- Use 1/2 in. (12.7 mm) PermaBase® in 1-hour and 2-hour rated assemblies (UL Classified).
- Achieves the lowest water-absorption rating of any cement board per ASTM C473, offering better installation.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Heat Shield Applications

- UL approved for heat shield/wall protector per ANSI/UL 1618 and ULC 632.
- Protects combustible walls.
- Reduces required clearance from wall by 40 percent.
- Lightweight and easy to install.

Cement Board Stucco Wall System

- Appropriate for all climates and resists the growth of mold and mildew.
- Extremely durable with increased resistance to impact and inclement weather.
- Acrylic polymers provide more resistance to fading, cracking and peeling.
- Engineered system that allows a faster installation while providing superior quality control (manufactured product that must comply with ASTM product specifications).
- Provides a 15-year exterior warranty – the industry's best.

Cement Board Masonry Veneer Wall System (CBMV)

- Engineered system that allows a faster installation while providing superior quality control (manufactured product that must comply with ASTM product specifications).
- Increased performance by utilizing polymer modified adhesive mortars (designed for hanging materials) rather than type S&N mortars (developed for stacking materials).
- Extremely durable with increased resistance to impact and inclement weather.
- Approved for use in ASTM C1780, and cement board is cited as an approved substrate for this system by the Masonry Veneer Manufacturers Association (MVMA): Installation Guide and Detailing Options for Compliance with ASTM C1780.
- Easily allows for the inclusion of continuous insulation into the assembly.
- Appropriate for all climates and resists the growth of mold and mildew.
- Speed up your schedule – faster, easier and cleaner than traditional metal lath/scratch coat method.
- IBC/IRC Compliant. Meets ASTM C1325.
- PermaBase is approved as a substrate for direct-applied finishes, tile, stone and thin brick in exterior applications, as outlined in ICC-ES Evaluation Report ESR-1510.
- PermaBase is suitable for use in combustible and non-combustible construction under the IBC and IRC, as outlined in ICC-ES Evaluation Report ESR-1510.

Continuous Insulation

- Engineered system that allows a faster installation while providing superior quality control (manufactured product that must comply with ASTM product specifications).
- Helps mitigate the loss of heat/air conditioning by insulating the studs (reduces thermal bridging).
- Helps eliminate air and moisture leakage.
- Appropriate for all climates, resists the growth of mold and mildew and offers fire protection.
- Provides added dimensional stability.
- Helps prevent the Weather Resistant Barrier (WRB) from being compromised as assembly components shift.
- Provides a 15-year exterior warranty – the industry's best.

SIZES AND PACKAGING

Thickness, Width and Length per Unit	# of Pcs.
PermaBase	
1/2" x 32" x 5' (12.7 mm x 813 mm x 1,524 mm)	50
1/2" x 32" x 8' (12.7 mm x 813 mm x 2,438 mm)	50
1/2" x 36" x 4' (12.7 mm x 914 mm x 1,219 mm)	50*
1/2" x 36" x 5' (12.7 mm x 914 mm x 1,524 mm)	50
1/2" x 36" x 6' (12.7 mm x 914 mm x 1,829 mm)	50*
1/2" x 36" x 8' (12.7 mm x 914 mm x 2,438 mm)	30
1/2" x 48" x 8' (12.7 mm x 1,219 mm x 2,438 mm)	30
5/8" x 36" x 5' (15.9 mm x 914 mm x 1,524 mm)	35
5/8" x 48" x 8' (15.9 mm x 1,219 mm x 2,438 mm)	24
3/8" x 48" x 8' (9.5 mm x 1,219 mm x 2,438 mm)	40*
3/8" x 36" x 5' (9.5 mm x 914 mm x 1,524 mm)	50*
3/4" x 48" x 8' (19.1 mm x 1,219 mm x 2,438 mm)	20*
PermaBase Underlayment	
1/4" x 48" x 4' (6.4 mm x 1,219 mm x 1,219 mm)	60
1/4" x 36" x 5' (6.4 mm x 914 mm x 1,524 mm)	60

*Special Order

PermaBase® BRAND Cement Board

PermaBase PLUS® Cement Board

PermaBase PLUS® Cement Board is a lightweight, rigid substrate made of Portland cement, aggregate and fiberglass mesh. It provides an exceptionally hard, durable surface and is able to withstand prolonged exposure to moisture.

Use it for use interior applications and select exterior applications, such as outdoor kitchens, grills and decks.

Size: 7/16 in. (11.1 mm) thick cement boards are available in a 36 in. (914 mm) width and in a standard length of 5 ft. (1,524 mm).

Basic Uses

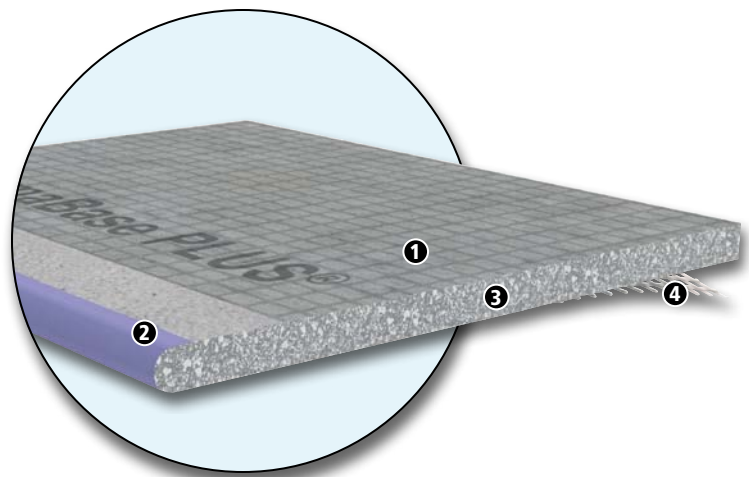
APPLICATIONS

PermaBase PLUS® Cement Board is ideally suited as an underlayment or backing surface for tub and shower surrounds, countertops, flooring and a variety of other interior and exterior applications.

ADVANTAGES

- Weighs up to 25 percent less than other cement boards on the market.
- IBC/IRC Compliant. Manufactured in accordance with ASTM C1325.
- Easier, cleaner cut using a standard utility knife and straightedge.
- Is impact resistant, extremely durable and dimensionally stable. It has excellent overall flexural, compressive and tensile strength characteristics.

PermaBASE
BRAND
PLUS
Cement Board



1. Fiberglass Mesh
2. Patented Reinforced Edge
3. Cementitious Core
4. Fiberglass Mesh

- Use in 1-hour and 2-hour rated assemblies (UL Classified).
- Works for both interior and select exterior applications.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

SIZE AND PACKAGING

Thickness, Width and Length	# of Pcs. per Unit
7/16" x 36" x 5' (11.1 mm x 914 mm x 1,524 mm)	60

PURPLE 
EVOLVE YOUR WALLS™

TECHNICAL DATA

PHYSICAL PROPERTIES	
	PermaBase PLUS
Thickness¹, Nominal	7/16" (11.1 mm)
Weight, Nominal	2.1 lbs. / sq. ft. (10.3 k/m ²)
Edges	Round
Flexural Strength⁸	≥ 750 psi
Fastener Holding⁷ (Wet and Dry)	≥ 90 lbs.
Freeze/Thaw Cycles¹⁰	100
Compressive Strength¹¹	N/A
Wind Load¹² (Studs 16" o.c.)	30 psf
Bending Radius	5' (1,524 mm)
Thermal Resistance³	R = .28, K = 2.7
Permeance⁴	> 10 perms
Water Absorption⁹ (% of Weight)	< 10%
Falling Ball Impact⁷ (12" drop)	Pass
Linear Expansion with Change Moisture⁷	≤ 0.07%
Mold Resistance⁵ (ASTM D3273)	Score of 10
Mold Resistant⁶ (ASTM G21)	Score of 0
Product Standard Compliance	ASTM C1325
Fire-Resistance Characteristics	
Core Type	N/A
UL Type Designation	PermaBase PLUS
Surface Burning Characteristics²	Class A
Flame Spread²	0
Smoke Development²	0
Applicable Standards and References	
ASTM A118.9 Test Methods and Specification for Cementitious Backer Units	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C666 Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing	
ASTM C947 Standard Test Method for Flexural Properties of Thin-Section Glass-Fiber-Reinforced Concrete (Using Simple Beam with Third-Point Loading)	
ASTM C1325 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing	
ASTM D1037 Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials	
ASTM D2394 Standard Test Methods for Simulated Service Testing of Wood and Wood-Base Finish Flooring	
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials	
ASTM E330 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference	
ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1325, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E84.

3. Tested in accordance with ASTM C518.

4. Tested in accordance with ASTM E96.

5. Tested in accordance with ASTM D3273.

6. Tested in accordance with ASTM G21.

7. Specified values per ASTM C1325, tested in accordance with ASTM D1037.

8. Specified values per ASTM C1325, tested in accordance with ASTM C947.

9. Tested in accordance with ASTM C473, 24-hour immersion.

10. Per ANSI A118.9 procedure B. Tested in accordance with ASTM C666.

11. Tested in accordance with ASTM D2394.

12. Tested in accordance with ASTM E330.

PermaBase UltraBacker® 1/4" Cement Board Underlayment

PermaBase UltraBacker® 1/4" (6.4 mm) Cement Board Underlayment is a rigid substrate made of Portland cement, aggregate and glass mesh and mat facer. It provides an exceptionally hard, smooth and durable surface that is able to withstand prolonged exposure to moisture.

Use it as an underlayment for ceramic tile on floors, countertops, tub decks and outdoor kitchen counters.

Size: 1/4 in. (6.4 mm) thick cement boards are available in a 36 in. (914 mm) width and in a standard length of 5 ft. (1,524 mm).

Basic Uses

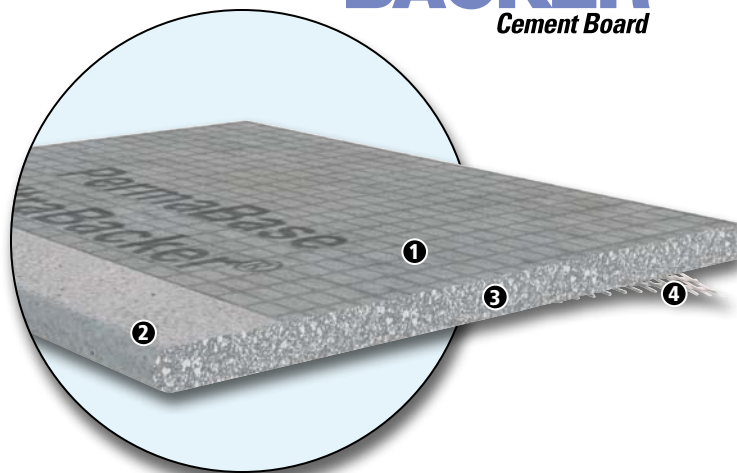
APPLICATIONS

Use UltraBacker® 1/4" Cement Board as an underlayment for ceramic tile on floors, countertops, tub decks and outdoor kitchen counters.

ADVANTAGES

- Smooth mesh and mat surface is 30 percent stronger and four times more rigid than competitive 1/4 in. (6.4 mm) cement boards.
- Allows for closer fastener application of nails or screws at the edge without crumbling or spinout – reinforced with patented EdgeTech® Technology.
- Cuts easily with a standard utility knife. No need for specialty or power tools.
- No need to modify adjacent thresholds when abutting to carpet, wood flooring or other common flooring materials, due to 1/4 in. (6.4 mm) thickness.

Perma**BASE**
BRAND
**ULTRA
BACKER**
Cement Board



1. Fiberglass Mesh/Mat
2. Patented Reinforced Edge
3. Cementitious Core
4. Fiberglass Mesh

- Absorbs less water (< 4 percent) than other backer boards, ensuring more open time and a better tile bond.
- Resists mold and moisture. Will not rot, disintegrate or swell when exposed to moisture.
- Works with all brands of thin-sets and grouts.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

SIZE AND PACKAGING

Thickness, Width and Length	# of Pcs. per Unit
1/4" x 36" x 5' (6.4 mm x 914 mm x 1,524 mm)	60

PURPLE 
EVOLVE YOUR WALLS™

TECHNICAL DATA

PHYSICAL PROPERTIES	
PermaBase UltraBacker	
Thickness¹, Nominal	1/4" (6.4 mm)
Weight, Nominal	2.0 lbs. / sq. ft. (9.8 k/m ²)
Edges	Round
Flexural Strength⁸	≥ 1750 psi
Fastener Holding⁷ (Wet and Dry)	≥ 90 lbs.
Freeze/Thaw Cycles¹⁰	100
Compressive Strength¹¹	N/A
Wind Load¹² (Studs 16" o.c.)	N/A
Bending Radius	N/A
Thermal Resistance³	R = .2, K = 2.7
Permeance⁴	> 10 perms
Water Absorption⁹ (% of Weight)	< 8%
Falling Ball Impact⁷ (12" drop)	Pass
Linear Expansion with Change Moisture⁷	≤ 0.07%
Mold Resistance⁵ (ASTM D3273)	Score of 10
Mold Resistant⁶ (ASTM G21)	Score of 0
Product Standard Compliance	ASTM C1325
Fire-Resistance Characteristics	
Core Type	N/A
UL Type Designation	N/A
Surface Burning Characteristics²	Class A
Flame Spread²	0
Smoke Development²	0
Applicable Standards and References	
ASTM A118.9 Test Methods and Specification for Cementitious Backer Units	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C666 Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing	
ASTM C947 Standard Test Method for Flexural Properties of Thin-Section Glass-Fiber-Reinforced Concrete (Using Simple Beam with Third-Point Loading)	
ASTM C1325 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing	
ASTM D1037 Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials	
ASTM D2394 Standard Test Methods for Simulated Service Testing of Wood and Wood-Base Finish Flooring	
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials	
ASTM E330 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference	
ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1325, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E84.

3. Tested in accordance with ASTM C518.

4. Tested in accordance with ASTM E96.

5. Tested in accordance with ASTM D3273.

6. Tested in accordance with ASTM G21.

7. Specified values per ASTM C1325, tested in accordance with ASTM D1037.

8. Specified values per ASTM C1325, tested in accordance with ASTM C947.

9. Tested in accordance with ASTM C473, 24-hour immersion.

10. Per ANSI A118.9 procedure B. Tested in accordance with ASTM C666.

11. Tested in accordance with ASTM D2394.

12. Tested in accordance with ASTM E330.

PermaBase 1/4" Cement Board Underlayment

PermaBase 1/4" (6.4 mm) Cement Board

Underlayment is a rigid substrate made of Portland cement, aggregate and glass mesh that provides an exceptionally hard, durable surface that is able to withstand prolonged exposure to moisture.

Use it as an underlayment for ceramic tile on floors, countertops, tub decks and outdoor kitchens.

Sizes: 1/4 in. (6.4 mm) thick cement board is available in 36 in. (914 mm) and 48 in. (1,219 mm) widths, and in standard lengths of 4 ft. (1,219 mm) and 5 ft. (1,524 mm).

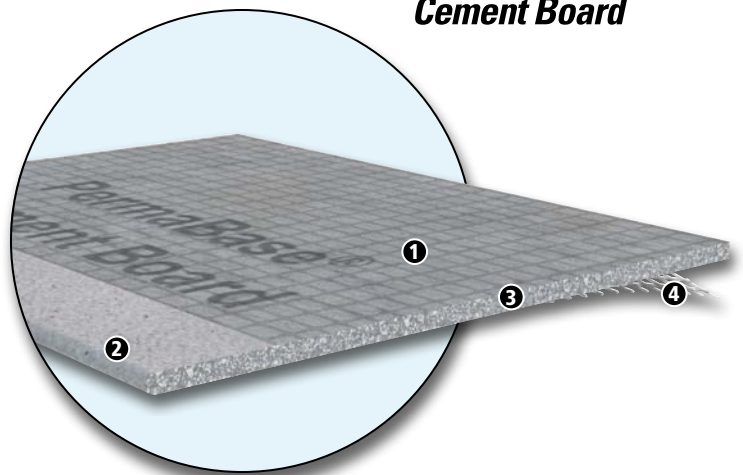
Basic Uses

APPLICATIONS

PermaBase 1/4" Cement Board Underlayment is ideally suited as an underlayment for ceramic tile on floors, countertops, tub decks and outdoor kitchens.

ADVANTAGES

- Lifetime Limited Warranty on PermaBase Interior Applications.
- The 1/4 in. (6.4 mm) thickness eliminates the need to modify adjacent thresholds when abutting to carpeting, wood flooring and other common flooring materials.
- PermaBase resists the growth of mold and mildew achieving a panel score of 10, the highest score possible, per ASTM D3273.
- Use PermaBase 1/4" Underlayment for counters, and it is ideal for applying directly over laminate or other wood surface countertops.



1. Fiberglass Mesh
2. Patented Reinforced Edge
3. Cementitious Core
4. Fiberglass Mesh

- PermaBase has a lower moisture absorption rate than other backer boards, ensuring more open time and a better tile bond.
- Can be cut using a standard utility knife instead of specialty tools or expensive power tools.
- Homogeneous core has fewer voids and provides a very clean score and snap.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

TECHNICAL DATA

PHYSICAL PROPERTIES	
PermaBase Underlayment	
Thickness¹, Nominal	1/4" (6.4 mm)
Weight, Nominal	1.8 lbs. / sq. ft. (8.8 k/m ²)
Edges	Round
Flexural Strength⁸	≥ 750 psi
Fastener Holding⁷ (Wet and Dry)	≥ 85 lbs.
Freeze/Thaw Cycles¹⁰	100
Compressive Strength¹¹	N/A
Wind Load¹² (Studs 16" o.c.)	N/A
Bending Radius	N/A
Thermal Resistance³	R = .2, K = 2.7
Permeance⁴	> 10 perms
Water Absorption⁹ (% of Weight)	< 8%
Falling Ball Impact⁷ (12" drop)	Pass
Linear Expansion with Change Moisture⁷	≤ 0.07%
Mold Resistance⁵ (ASTM D3273)	Score of 10
Mold Resistant⁶ (ASTM G21)	Score of 0
Product Standard Compliance	ASTM C1325
Fire-Resistance Characteristics	
Core Type	N/A
UL Type Designation	N/A
Surface Burning Characteristics²	Class A
Flame Spread²	0
Smoke Development²	0
Applicable Standards and References	
ASTM A118.9 Test Methods and Specification for Cementitious Backer Units	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C666 Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing	
ASTM C947 Standard Test Method for Flexural Properties of Thin-Section Glass-Fiber-Reinforced Concrete (Using Simple Beam with Third-Point Loading)	
ASTM C1325 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing	
ASTM D1037 Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials	
ASTM D2394 Standard Test Methods for Simulated Service Testing of Wood and Wood-Base Finish Flooring	
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials	
ASTM E330 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference	
ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1325, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E84.

3. Tested in accordance with ASTM C518.

4. Tested in accordance with ASTM E96.

5. Tested in accordance with ASTM D3273.

6. Tested in accordance with ASTM G21.

7. Specified values per ASTM C1325, tested in accordance with ASTM D1037.

8. Specified values per ASTM C1325, tested in accordance with ASTM C947.

9. Tested in accordance with ASTM C473, 24-hour immersion.

10. Per ANSI A118.9 procedure B. Tested in accordance with ASTM C666.

11. Tested in accordance with ASTM D2394.

12. Tested in accordance with ASTM E330.

PermaBase Flex® Cement Board

PermaBase Flex® Cement Board is a polymer-modified cement board reinforced with an alkali-resistant fiber mesh. The board is extremely flexible, making it the ideal substrate for curved applications.

Use it as a backing surface around ceilings, beams, columns, arches and archways, walls and anywhere an evenly curved surface is required.

Sizes: 1/2 in. (12.7 mm) thick cement boards are available in 36 in. (914 mm) and 48 in. (1,219 mm) widths and in standard lengths of 6 ft. (1,829 mm) and 8 ft. (2,438 mm).

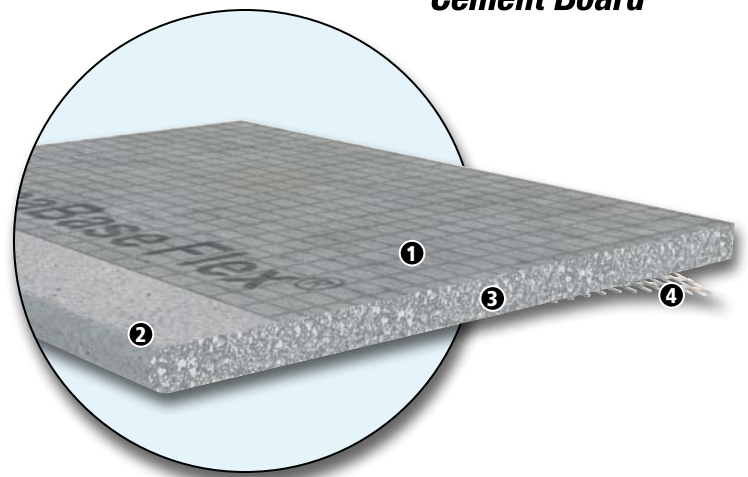
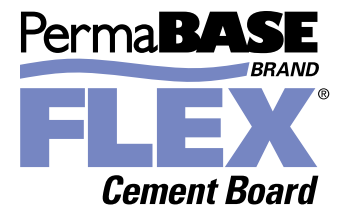
Basic Uses

APPLICATIONS

PermaBase Flex® Cement Board is ideally suited for curved wall construction, including curved walls, interior and exterior columns, curved shower walls, curved stairways and steps, and archways and barrel ceilings.

ADVANTAGES

- 6 in. (152 mm) minimum radius for 90° corners.
- Bends immediately, easily and evenly.
- Exclusive: it is the only 1/2 in. (12.7 mm) lightweight cement board that bends.
- Bends without water saturation or kerf cuts.
- Installs easily, reducing skilled labor costs.
- Use it for interior or exterior applications.
- Resists impact.



1. Fiberglass Mesh
2. Patented Reinforced Edge
3. Cementitious Core
4. Fiberglass Mesh

- Creates uniform curved surfaces.
- Unaffected by water or moisture.
- Remains dimensionally stable.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

SIZE AND PACKAGING

Thickness, Width and Length	# of Pcs. per Unit
1/2" x 36" x 6' (12.7 mm x 914 mm x 1,829 mm)	25
1/2" x 48" x 8' (12.7 mm x 1,219 mm x 2,438 mm)	30*

*Special Order

TECHNICAL DATA

PHYSICAL PROPERTIES	
	PermaBase Flex
Thickness¹, Nominal	1/2" (12.7 mm)
Weight, Nominal	3.0 lbs. / sq. ft. (14.6 k/m ²)
Edges	Round
Fastener Holding⁷ (Wet and Dry)	N/A
Freeze/Thaw Cycles⁹	100
Compressive Strength¹⁰	1,022 psi
Wind Load¹¹ (Studs 16" o.c.)	N/A
Bending Radius	6" Minimum
Thermal Resistance³	R = .37, K = 2.7
Permeance⁴	> 10 perms
Water Absorption⁸ (% of Weight)	< 8%
Falling Ball Impact⁷ (12" drop)	Pass
Linear Expansion with Change Moisture⁷	≤ 0.07%
Mold Resistance⁵ (ASTM D3273)	Score of 10
Mold Resistant⁶ (ASTM G21)	Score of 0
Product Standard Compliance	ASTM C1325
Fire-Resistance Characteristics	
Core Type	N/A
UL Type Designation	N/A
Surface Burning Characteristics²	Class A
Flame Spread²	0
Smoke Development²	0
Applicable Standards and References	
ASTM A118.9 Test Methods and Specification for Cementitious Backer Units	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C666 Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing	
ASTM C1325 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing	
ASTM D1037 Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials	
ASTM D2394 Standard Test Methods for Simulated Service Testing of Wood and Wood-Base Finish Flooring	
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials	
ASTM E330 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference	
ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified values per ASTM C1325, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E84.

3. Tested in accordance with ASTM C518.

4. Tested in accordance with ASTM E96.

5. Tested in accordance with ASTM D3273.

6. Tested in accordance with ASTM G21.

7. Specified values per ASTM C1325, tested in accordance with ASTM D1037.

8. Tested in accordance with ASTM C473, 24 hour immersion.

9. Per ANSI A118.9 procedure B. Tested in accordance with ASTM C666.

10. Tested in accordance with ASTM D2394.

11. Tested in accordance with ASTM E330.

Installation Recommendations

INTERIOR

General

All framing should comply with local building code requirements and be designed to provide support with a maximum allowable deflection of L/360 under all intended loads. Must space framing members a maximum of 16 in. (406 mm) o.c.

Cut or score PermaBase® on printed side of panel. Use a straightedge and pencil to mark a line. Use a utility knife to score/cut the glass mesh. Snap the board and cut through the now visible glass mesh on the other side. Install tile and tile setting materials in accordance with current ANSI specifications and Tile Council of North America (TCNA) guidelines.

Control Joints

Allow a maximum of 30 linear feet between control joints. You must install a control joint to the following locations: where expansion joints occur in the framing or building (discontinue all cross-furring members located behind joint); when boards abut dissimilar materials; where framing material changes; at changes of building shape or structural system; at each story separation.

Place control joints at corners of window and door openings, or follow specifications of architect. Follow finish manufacturer's recommendations for joints required to be less than 30 ft. (9,144 mm).

Do not fill control joint cavity with coating or other materials.

Wall Framing

Continuously support edges of PermaBase parallel to framing. Provide additional blocking when necessary to permit proper PermaBase attachment.

Do not install PermaBase directly over protrusions from stud plane, such as heavy brackets and fastener heads. Studs above a shower floor should either be notched or furred to accommodate the thickness of waterproof membrane or pan. The surround opening for a tub or precast shower receptor should not be more than 1/4 in. (6.4 mm) longer than the unit to install.

Ceiling Framing

The deflection of the complete ceiling assembly due to dead load (including insulation, PermaBase, bonding material and facing material) should not exceed L/360. When you apply the dead load to the ceiling frame, it should not exceed 10 psf. Ceiling joist or furring channel should not exceed 16 in. (406 mm) o.c. (Continuously support the edges of PermaBase parallel to framing.)

To permit proper PermaBase attachment, provide additional blocking when necessary.

PermaBase Cement Board

Apply PermaBase with ends and edges closely butted but do not force together. Stagger end joints in successive courses. Drive fasteners into field of cement board first, working toward ends and edges.

Space fasteners a maximum of 8 in. (203 mm) o.c. for walls, 6 in. (152 mm) o.c. for ceilings with perimeter fasteners at least 3/8 in. (9.5 mm) and less than 5/8 in. (15.9 mm) from ends and edges. Ensure PermaBase is tight to framing.

Joint Reinforcement

Completely fill the tapered, recessed board joints and gaps between each panel with bonding material. On non-tapered joints, apply a 6 in. (152 mm) wide, approximately 1/16 in. (1.6 mm) thick coat of bonding material over entire joint.

For all joints, immediately embed a 2 in. (50.8 mm) alkali-resistant fiberglass mesh tape fully into applied bonding material and allow it to cure. For outside corners, use 4 in. (102 mm) wide mesh tape. Apply the same bonding material to corners, control joints, trims and other accessories. To fully conceal, feather bonding material over fasteners.

Subfloor Or Base

For flooring applications with 16 in. (406 mm) o.c. floor joists, use 5/8 in. (15.9 mm) tongue-and-groove exterior grade plywood or 3/4 in. (19.1 mm) tongue-and-groove exterior grade OSB.

For 19.2 in. (488 mm) o.c. and 24 in. (610 mm) o.c. floor joists, you must use 3/4 in. (19.1 mm) tongue-and-groove exterior grade plywood or OSB. Tile size for floors with 24 in. (610 mm) o.c. floor joists must be 12 in. (305 mm) by 12 in. (305 mm) or larger. The joist and subfloor assembly must meet L/360 as well as the appropriate code tables for live and dead loads.

Underlayment

Using a 1/4 in. (6.4 mm) square-notched trowel, apply a setting bed of polymer-modified mortar (or thin-set mortar) to the subfloor or counter base. Immediately laminate PermaBase® to subfloor or base, leaving a 1/8 in. (3.2 mm) space between boards at all joints and corners. Leave a 1/4 in. (6.4 mm) gap along walls. Stagger all joints so that they do not line up with underlying substrate joints.

Fasten PermaBase every 8 in. (203 mm) o.c. throughout board field and around all edges while setting bed mortar is still workable. Around perimeter of each board, locate fasteners 2 in. (50.8 mm) from corners and not less than 3/8 in. (9.5 mm) from the edges. Fill all joints solid with bonding material.

On non-tapered joints, such as butt ends, apply a 6 in. (152 mm) wide, 1/16 in. (1.6 mm) thick coat over the entire joint. For all joints, immediately embed 2 in. (50.8 mm) fiberglass mesh tape fully into applied bonding material; center tape over joint. To fully conceal, apply bonding material over fasteners. Remove all excess bonding material and allow it to cure.

WALL PROTECTOR/HEAT SHIELD

1/2" PermaBase® and 7/16" PermaBase PLUS® are listed by Underwriters Laboratories, Inc., for use with UL-listed solid-fuel room heaters and fireplace stoves. Used as a wall protector/heat shield, PermaBase Cement Board reduces by 40 percent the manufacturer-specified clearance (minimum 12 in. [305 mm]) between the room heater or stove and a combustible wall surface.

Installation: Furring is made by cutting a full PermaBase Panel into 4 in. (102 mm) wide strips with a carbide tipped saw or utility knife. Attach a double layer of furring strips to the wall studs using cement board screws, which provide a minimum penetration of 3/4 in. (19.1 mm) into the framing.

When installing panels, leave a 3 in. (76.2 mm) gap at the ceiling and 1 in. (25.4 mm) to 2 in. (50.8 mm) gap at the floor. This air space is required for the proper functioning of the heat shield. Do not close or block these openings.

Heat shield panels may be cut to required size using a standard utility knife or power saw. Fasten the PermaBase Panels to the studs with galvanized roofing nails or cement board screws spaced 8 in. (203 mm) o.c. Cement board screws must be long enough to penetrate into framing a minimum of 3/4 in. (19.1 mm). Do not install any nails or screws into the wall area directly behind the proposed location of the appliance.

Finishing: Prefill joints with latex-fortified Portland cement mortar, then immediately embed PermaBase Tape and level joints. As an alternative, apply PermaBase Tape over the joints, then apply latex-fortified Portland cement mortar, forcing it through the tape to completely fill and level the joints. All non-combustible finishes, such as ceramic tile, thin brick or stone can be applied over wall-shield.

Do not apply combustible finishes, such as wallpaper, to cement board surface.

EXTERIOR

General

All framing should comply with local building code requirements and be designed to provide support with a maximum allowable deflection of L/360 under all intended live, including wind, and dead loads. To cut PermaBase Cement Boards, view interior general installation recommendations.

Control Joints

Allow a maximum of 16 lineal ft. (4,877 mm) between control joints. Consult finish manufacturer for other requirements. For exterior tile applications, space control joints a maximum of every 12 ft. (3,658 mm).

You must install a control joint to the following locations: where expansion joints occur in the framing or building (discontinue all cross-furring members located behind joint); when boards abut dissimilar materials; where framing material changes; at changes of building shape or structural system; at each story separation. Place control joints at corners of window and door openings, or follow specifications of architect. Do not fill control joint cavity with coating or other material.

WALLS AND CEILINGS

Wall Framing

Space studs a maximum of 16 in. (406 mm) o.c. Continuously support edges/ends of PermaBase® parallel to framing. To permit proper PermaBase attachment, provide additional blocking when necessary. Do not install PermaBase directly over protrusions from stud plane, such as heavy brackets or fastener heads.

Ceiling Framing

The deflection of the complete ceiling assembly due to dead load (including insulation, PermaBase, bonding material and facing material) should not exceed $L/360$. When you apply the dead load to the ceiling frame, it should not exceed 10 psf. Ceiling joist or furring channel should not exceed 16 in. (406 mm) o.c. (Continuously support the edges of PermaBase parallel to framing.)

To permit proper PermaBase attachment, provide additional blocking when necessary.

Water Barrier

While moisture does not affect PermaBase, you must install a Weather Resistant Barrier (WRB) to protect the cavity. The type and specific placement or location of the water barrier will vary based on local building codes and/or the manufacturer's warranties. Consult the WRB manufacturer's recommendations for specific installation guidelines.

PermaBase® Cement Board

Apply PermaBase with ends and edges closely butted but do not force together. Stagger end joints in successive courses. Drive fasteners into field of cement board first, working toward ends and edges.

Space fasteners a maximum of 8 in. (203 mm) o.c. for walls, 6 in. (152 mm) o.c. for ceilings with perimeter fasteners at least $3/8$ in. (9.5 mm) and less than $5/8$ in. (15.9 mm) from ends and edges.

Joint Reinforcement

Completely fill the tapered, recessed board joints and gaps between each panel with trowel bonding material. On non-tapered joints, apply a 6 in. (152 mm) wide, approximately $1/16$ in. (1.6 mm) thick coat of bonding material over entire joint.

For all joints, immediately embed a 4 in. (102 mm) alkali-resistant fiberglass mesh tape fully into applied bonding material and allow it to cure. Apply the same bonding material to corners, control joints, trims and other accessories. To fully conceal, feather bonding material over fasteners.

DECKS

Subfloor

Securely glue and fasten plywood to floor joists spaced a maximum of 16 in. (406 mm) o.c. Slope subfloor at a minimum pitch of $1/4$ in. (6.4 mm) per foot. The floor surface should be true to plane within $1/8$ in. (3.2 mm) in 10 ft. (3,048 mm).

Underlayment

Using a $1/4$ in. (6.4 mm) square-notched trowel, apply a setting bed of Latex-Portland cement mortar to the subfloor. Immediately laminate PermaBase Cement Board to the subfloor, leaving a $1/8$ in. (3.2 mm) space between boards at all joints and corners. Leave a $1/4$ in. (6.4 mm) gap along walls. Stagger joints so they do not line up with underlying substrate joints. Fasten PermaBase every 8 in. (203 mm) o.c. throughout board field and around all edges while setting bed mortar is still workable. Around perimeter of each board, locate fasteners 2 in. (50.8 mm) from the corners and not less than $3/8$ in. (9.5 mm) from the edges. Fill all joints solid with bonding material. On non-tapered joints, such as butt ends, apply a 6 in. (152 mm) wide, $1/16$ in. (1.6 mm) thick coat over the entire joint. For all joints, embed alkali-resistant fiberglass mesh tape fully into applied bonding material; center tape over joint. To fully conceal, apply bonding material over fasteners. Remove all excess bonding material and allow it to cure.

Waterproof Membrane

Using a trowel, apply a waterproof membrane to the entire surface of the cement board. (Follow the manufacturer's installation instructions in detail.)

PERMABASE FLEX®

- Framing must be spaced a maximum of 8 in. (203 mm) o.c. Maximum fastener spacing should not exceed 8 in. (203 mm) o.c. for wall and 6 in. (152 mm) o.c. for ceiling applications.
- Maximum framing spacing should not exceed 8 in. (203 mm) o.c.

Limitations**INTERIOR**

- Treat joints with alkali-resistant fiberglass mesh tape set in a polymer-modified mortar.
- Do not use conventional paper gypsum board tape, joint compound and gypsum board nails or screws.
- Do not exceed 16 in. (406 mm) o.c. as maximum wall framing spacing. Must be designed to limit deflection to L/360 under all live and dead loads.
- Steel framing must be minimum 20-gauge (galvanized) (.0312 in. design thickness) or heavier.
- Do not use 1/4 in. (6.4 mm) PermaBase® and PermaBase UltraBacker® 1/4" Cement Board Underlayment on walls or ceilings.
- PermaBase® is not a water barrier. Consult local building code for moisture-barrier requirements.
- Do not use with vinyl flooring.
- To install interior direct-applied finishes to PermaBase, you must embed reinforcing mesh in basecoat. Consult finish manufacturer for additional requirements.
- Do not expose PermaBase to temperatures over 220°F (105°C).
- Do not use PermaBase as a nailing base for other finishes.

EXTERIOR

- To install properly, follow the instructions of the finish material manufacturer.
- For conventional Portland cement plaster systems, you must use a self-furring metal lath over PermaBase and fasten it to studs.
- Install a code-approved Weather Resistant Barrier (WRB) to protect the cavity. The type and placement will vary per local building codes and/or manufacturer's specifications, installation guidelines and warranties.
- Do not expose PermaBase to temperatures over 220°F (105°C).
- Do not use PermaBase as a nailing base for other finishes.

Cement Board Stucco Wall System (CBSS)

- Follow finish material manufacturer's instructions for proper installation.
- Treat joints in PermaBase with mesh tape and basecoat.
- Thin veneer construction can reveal planar irregularities in framing.
- Minor cracking at joints may become visible in finished exterior surface.
- Exterior finishes applied directly to PermaBase: Reinforcing mesh must be embedded in basecoat (consult exterior finish manufacturer for additional installation requirements).
- Code-Approved Weather Resistant Barrier (WRB) must first be installed to protect the cavity (type and placement will vary per local building codes and/or manufacturer's specifications, installation guidelines and warranties).

Cement Board Masonry Veneer Wall System (CBMV)

- Sheathing selection and installation varies according to type of wall construction.
- Code-approved Weather Resistant Barrier (WRB) must be installed to protect the cavity (type and placement will vary per local building codes and/or manufacturer's specifications, installation guidelines and warranties).
- Treat joints with alkali-resistant fiberglass mesh tape set in a polymer-modified mortar.
- Follow mortar manufacturer's instructions for proper installation.

Continuous Insulation

- Sheathing selection and installation varies according to type of wall construction.
- Code-approved Weather Resistant Barrier (WRB) must first be installed (type and placement will vary per local building codes and/or manufacturer's specifications, installation guidelines and warranties).

PERMABASE ULTRABACKER® LIMITATIONS

- Treat joints with alkali-resistant fiberglass mesh tape set in a Latex-Portland cement mortar.
- Do not use conventional paper gypsum board tape, joint compound and gypsum board nails or screws.
- Do not use PermaBase UltraBacker® Cement Board on walls or ceilings.
- Do not use UltraBacker® with vinyl flooring.
- Do not expose UltraBacker to temperatures over 220°F (105°C).

1/4" UNDERLAYMENT LIMITATIONS

- Treat joints with alkali-resistant fiberglass mesh tape set in a Latex-Portland cement mortar.
- Do not use conventional paper gypsum board tape, joint compound and gypsum board nails or screws.
- Do not use PermaBase 1/4" Cement Board Underlayment on walls or ceilings.
- Do not use PermaBase 1/4" Cement Board Underlayment with vinyl flooring.
- Do not expose this cement board to temperatures over 220°F (105°C).

PERMABASE FLEX® LIMITATIONS

PermaBase Flex® has the same limitations as PermaBase® Cement Board. In addition:

- For convex surfaces, apply PermaBase Flex with the rough surface and tapered edges exposed.
- For concave surfaces, apply PermaBase Flex with the smooth surface exposed.
- Do not use PermaBase Flex Cement Board for fire-rated assemblies.

HANDLING AND PROJECT CONDITIONS

- Avoid water exposure during shipping, handling, storage, installation and after installation of cement boards to avoid the formation of mold or mildew.
- Store cement boards off the ground and under cover. Store boards flat. Use sufficient supports extending under the entire length of cement boards to prevent sagging.
- Keep cement boards dry to minimize the potential for mold growth. Take adequate care while transporting, storing, applying and maintaining cement boards.
- Do not apply cement boards with visible signs of moisture damage or mold growth. Do not apply cement boards over other building materials where conditions exist that are favorable to mold growth.

MAINTENANCE FOLLOWING APPLICATION

- Maintain essential elements of sound weather-tight building envelope, including roofing, joint sealants, windows and flashings.
- Take immediate and appropriate remediation measures as soon as water leaks or condensation sources are identified.
- Perform routine cleaning and maintenance operations using methods that prevent moisture saturation of cement boards.
- Maintain final wall finishes to protect the cement board as well as support the structure.

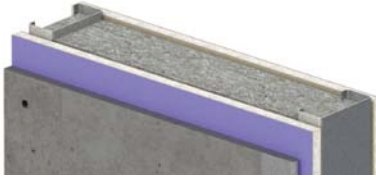
UL Listed PermaBase® Cement Board Partitions – Steel Framing

1-HOUR FIRE RATING
V452 UL DESIGN



7/16" PermaBase PLUS or 1/2" PermaBase applied vertically or horizontally to one side of 3-5/8" steel studs 16" o.c. 5/8" Fire-Shield Gypsum Board applied vertically to opposite side. 3" mineral wool insulation in stud cavities.

1-HOUR FIRE RATING
U425 UL DESIGN



7/16" PermaBase PLUS or 1/2" PermaBase applied vertically or horizontally over 5/8" Fire-Shield Gypsum Board applied vertically to each side of 3-1/2", 20-gauge steel studs 16" o.c. PermaBase secured to studs with cement board screws of adequate length to penetrate studs 3/8" spaced 8" o.c.

1-HOUR FIRE RATING
V438 UL DESIGN



7/16" PermaBase PLUS or 1/2" PermaBase applied vertically or horizontally over 5/8" Fire-Shield Gypsum Board applied vertically to each side of 3-5/8" steel studs 16" o.c. PermaBase secured to studs with cement board screws of adequate length to penetrate studs 3/8" spaced 8" o.c.

2-HOUR FIRE RATING
V452 UL DESIGN



7/16" PermaBase PLUS or 1/2" PermaBase applied vertically over 1/2" Fire-Shield C or 5/8" Fire-Shield Gypsum Board, applied vertically to one side of 3-5/8" steel studs 16" o.c. 2 layers 1/2" Fire-Shield C or 5/8" Fire-Shield Gypsum Board applied vertically to opposite side. 3" mineral wool insulation in stud cavities.

1-HOUR FIRE RATING
V452 UL DESIGN



7/16" PermaBase PLUS or 1/2" PermaBase applied vertically or horizontally to one side of double row of 3-5/8" steel studs 16" o.c. 5/8" Fire-Shield Gypsum Board applied vertically to opposite side. 3" mineral wool insulation in stud cavities.

2-HOUR FIRE RATING
V438 UL DESIGN



7/16" PermaBase PLUS or 1/2" PermaBase applied vertically or horizontally over two layers 5/8" Fire-Shield Gypsum Board applied vertically to each side of 2-1/2" steel studs 16" o.c. PermaBase secured to studs with cement board screws of adequate length to penetrate studs 3/8" spaced 8" o.c.

UL Listed PermaBase® Cement Board Partitions – Wood Framing

1-HOUR FIRE RATING
U392 UL DESIGN



7/16" PermaBase PLUS or 1/2" PermaBase applied vertically or horizontally to one side of 2x4 wood studs 16" o.c. with 1-1/4" cement board screws spaced 8" o.c. Ceramic tile installed over PermaBase. 5/8" Fire-Shield Gypsum Board applied vertically or horizontally to opposite side with 6d nails spaced 7" o.c. 3-1/2" mineral wool insulation in stud cavities.

1-HOUR FIRE RATING
U392 UL DESIGN



7/16" PermaBase PLUS or 1/2" PermaBase applied vertically or horizontally to each side of 2x4 wood studs 16" o.c. with 1-1/4" cement board screws spaced 8" o.c. Ceramic tile installed over PermaBase. 3-1/2" mineral wool insulation in stud cavities.

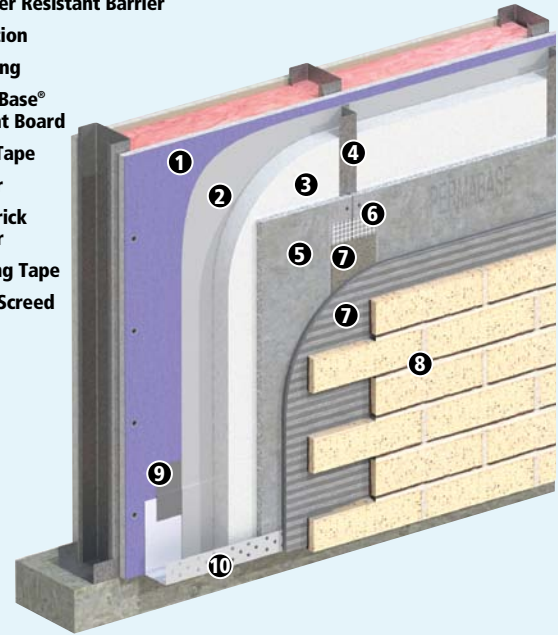
PermaBase®
Cement Boards

This section provides information on how to utilize PermaBase® within both a CBMV System and a Continuous Insulation System. While some typical examples are shown on these pages for reference purposes, the specifications and details on how to design and construct individual systems should be obtained from the adhering material or veneer manufacturer of the materials that are being used to complete the system.

For more information go to: permabase.com/exterior.

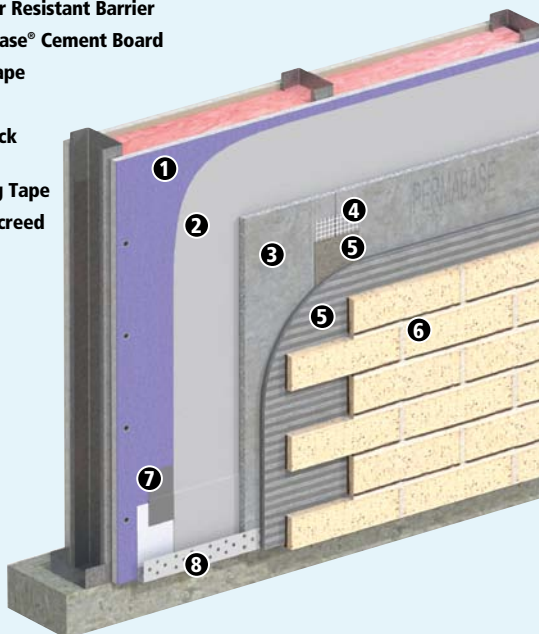
CONTINUOUS INSULATION – Z-FURRING INSTALLATION

1. EXP® Sheathing
2. Weather Resistant Barrier
3. Insulation
4. Z-Furring
5. PermaBase® Cement Board
6. Mesh Tape
7. Mortar
8. Thin Brick Veneer
9. Flashing Tape
10. Weep Screed



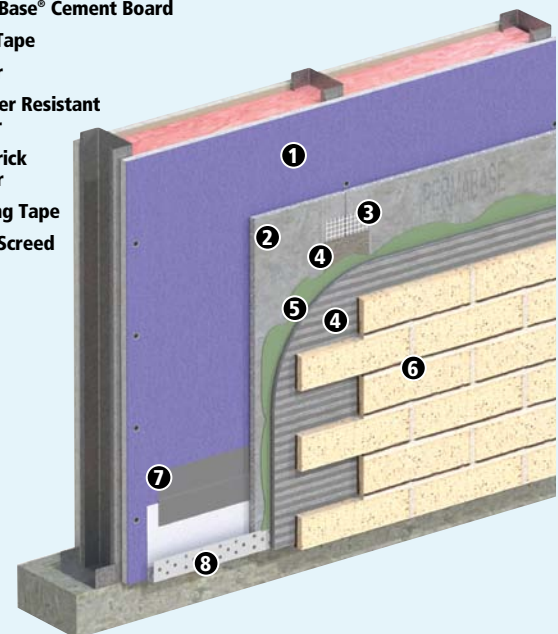
CEMENT BOARD MASONRY VENEER – THIN BRICK

1. EXP® Sheathing
2. Weather Resistant Barrier
3. PermaBase® Cement Board
4. Mesh Tape
5. Mortar
6. Thin Brick Veneer
7. Flashing Tape
8. Weep Screed



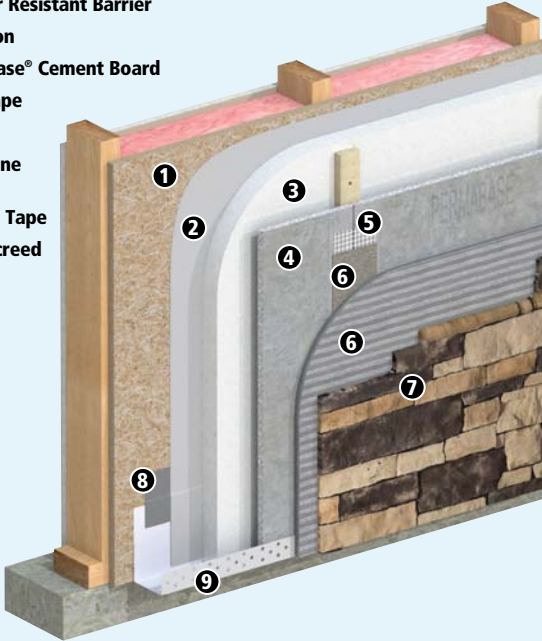
CEMENT BOARD MASONRY VENEER – LIQUID WRB

1. EXP® Sheathing
2. PermaBase® Cement Board
3. Mesh Tape
4. Mortar
5. Weather Resistant Barrier
6. Thin Brick Veneer
7. Flashing Tape
8. Weep Screed



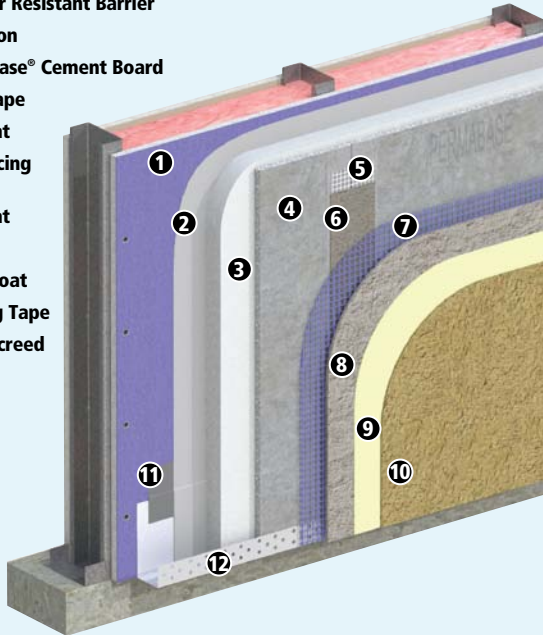
CONTINUOUS INSULATION – BATTEN STRIP

- 1. Sheathing
- 2. Weather Resistant Barrier
- 3. Insulation
- 4. PermaBase® Cement Board
- 5. Mesh Tape
- 6. Mortar
- 7. Thin Stone Veneer
- 8. Flashing Tape
- 9. Weep Screenshot



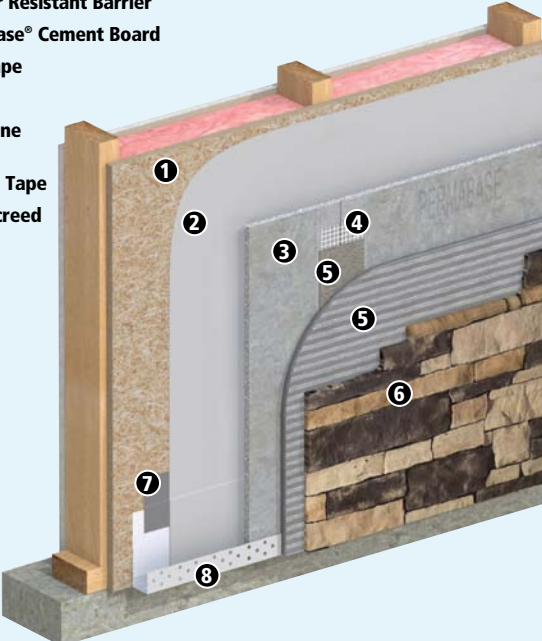
CONTINUOUS INSULATION – SPECIALTY FASTENER

- 1. EXP® Sheathing
- 2. Weather Resistant Barrier
- 3. Insulation
- 4. PermaBase® Cement Board
- 5. Mesh Tape
- 6. Basecoat
- 7. Reinforcing Mesh
- 8. Basecoat
- 9. Primer
- 10. Finish Coat
- 11. Flashing Tape
- 12. Weep Screenshot



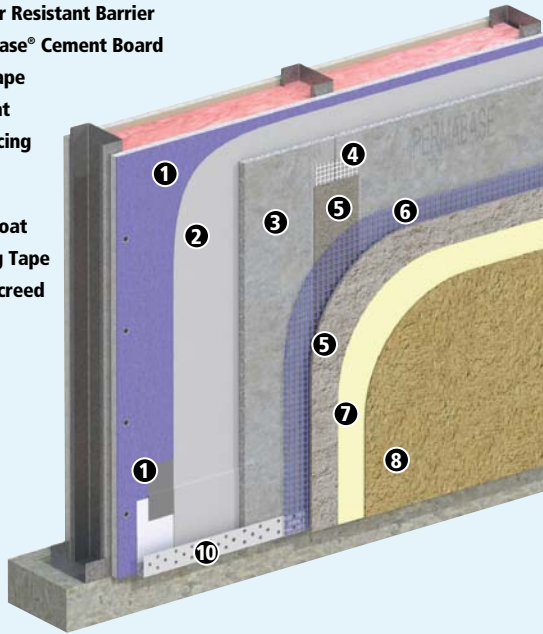
CEMENT BOARD MASONRY VENEER – STONE

- 1. Sheathing
- 2. Weather Resistant Barrier
- 3. PermaBase® Cement Board
- 4. Mesh Tape
- 5. Mortar
- 6. Thin Stone Veneer
- 7. Flashing Tape
- 8. Weep Screenshot



CEMENT BOARD STUCCO

- 1. EXP® Sheathing
- 2. Weather Resistant Barrier
- 3. PermaBase® Cement Board
- 4. Mesh Tape
- 5. Basecoat
- 6. Reinforcing Mesh
- 7. Primer
- 8. Finish Coat
- 9. Flashing Tape
- 10. Weep Screenshot



PermaBase®
Cement Boards

**DIVIDER WALL
INSTALLATION**

- 1. PermaBase® Cement Board
- 2. Membrane
- 3. Latex-Portland Cement Mortar
- 4. Alkali-Resistant Mesh Tape



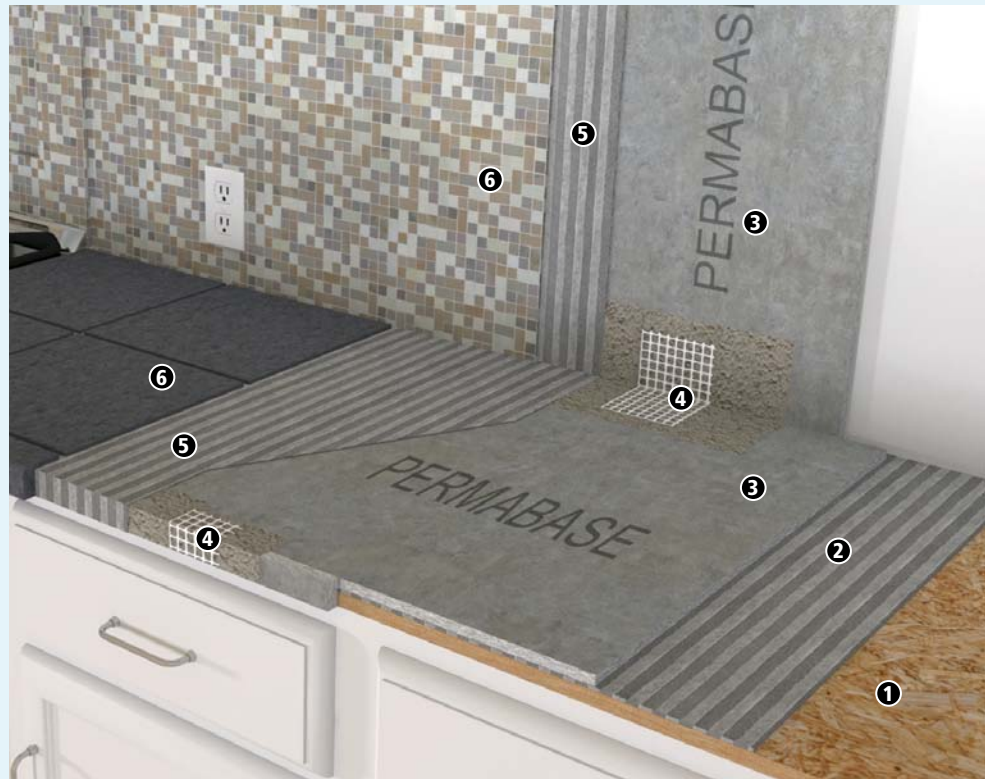
**SHOWER
INSTALLATION**

- 1. Support Framing
1/4" / 12" slope toward drain
- 2. Plywood, Min. 1/2"
- 3. PermaBase® Cement Board
- 4. Membrane
- 5. Latex-Portland Cement Mortar
- 6. Alkali-Resistant Mesh Tape
- 7. Sealant
- 8. Tile and Grout



COUNTERTOP INSTALLATION

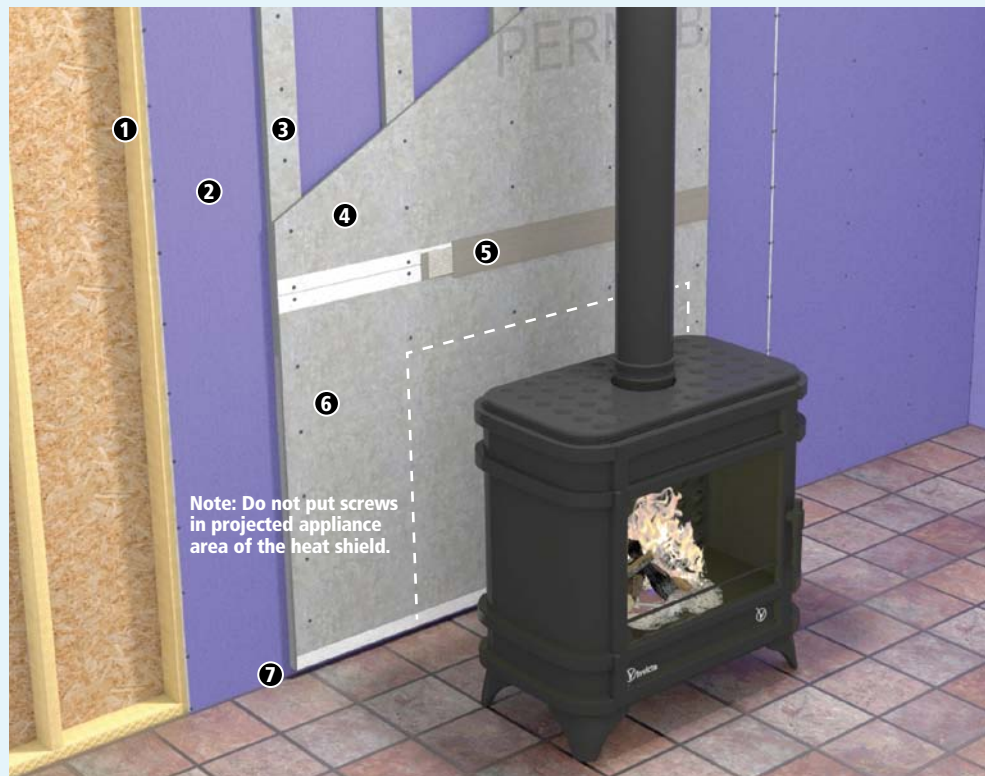
1. Plywood
2. Latex-Portland Cement Mortar
3. PermaBase® Cement Board
4. Fiberglass Mesh Tape (Alkali-Resistant) Embedded in Mortar
5. Latex-Portland Cement Mortar
6. Tile and Grout



HEAT SHIELD INSTALLATION

1. Studs Spaced 16 in. o.c.
2. Existing Gypsum Board
3. Two Layers 4 in. wide Furring Strips
4. PermaBase® Heat Shield
5. Joint Treatment
6. Fasteners Spaced 8 in. o.c. Maximum
7. 1-2 in. Minimum Clearance from the Floor

PermaBase® heat shielding permits clearance reduction up to 40 percent of the manufacturer's suggested clearance.



FLOOR UNDERLAYMENT

1. Joists
2. Subfloor
3. Latex-Portland Cement Mortar
4. PermaBase® Cement Board
5. Fiberglass Mesh Tape (Alkali-Resistant)
6. Latex-Portland Cement Mortar
7. Tile



Accessories – Screws and Mesh Tape For More Information

PermaBase offers the following screws to complete your installation:

- 1-1/4" or 1-5/8" corrosion-resistant screws for use with wood framing. Available in bulk boxes and retail packages.
- 1-1/4" or 1-5/8" corrosion-resistant screws for use with 20-gauge or heavier steel framing. Available in bulk boxes and retail packages.

PermaBase offers the following assortment of joint reinforcement tapes:

- 2" wide polymer-coated (alkali-resistant) mesh tape in 50 ft. and 250 ft. rolls for interior applications.
- 4" wide polymer-coated (alkali-resistant) mesh tape in 150 ft. rolls for exterior applications.

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



Ready Mix

Joint Compounds

PROFORM[®]
BRAND
Interior Finishing Products

ProForm®
Finishing Products



ProForm® BRAND Interior Finishing Products provide the right ready mix or setting compounds to finish your complex projects. ProForm® offers high-quality, consistent formulas that are easy to apply, saving you time and effort. Do you need superior bonding, excellent sanding characteristics, lightweight formulas and quick set times? You can depend on ProForm. Select products even offer added mold resistance or help reduce airborne dust.

National 
Gypsum[®]

Ready Mix Joint Compounds

ProForm® BRAND Ultra Lite® All Purpose



APPLICATIONS

Use for all phases of finishing, from embedding joint tape to final coats.

ADVANTAGES

- Weighs up to 40% less than standard ready mix – the lightest formula available.
- Allows more open time.
- Provides excellent bond.
- Pulls and sands easily.
- Excellent for use in all taping and finishing tools.

TECHNICAL DATA

Packaging	Pail: 4.5 gal. (17 L)
	Cartons: 3.5 gal. (13.2 L) 4.5 gal. (17 L)
Approx. Coverage	123-140 lbs. (9 gal.) / 1,000 sq. ft.

ProForm® BRAND Lite Blue



APPLICATIONS

Use for finishing joints and cornerbead, spotting fasteners and textures.

ADVANTAGES

- Reduces shrinkage by up to 33%.
- Lessens pocking and pinholing.
- Pulls and sands easily.
- Provides superior finish.
- Covers metal beads in two coats.

TECHNICAL DATA

Packaging	Pail: 4.5 gal. (17 L)
	Cartons: 3.5 gal. (13.2 L) 4.5 gal. (17 L)
Approx. Coverage	123-140 lbs. (9 gal.) / 1,000 sq. ft.

ProForm® BRAND XP® Lite with Dust-Tech®



APPLICATIONS

Use for finishing joints and cornerbead, spotting fasteners, skimming and textures, and repairing cracks in plaster walls.

ADVANTAGES

- Reduces airborne dust by 60% – quick and easy clean-up.
- Reduces shrinkage by up to 33%.
- Resists mold growth – per ASTM G21 score of 0 (best) and ASTM D3273 score of 10 (best).
- Provides superior finish.
- Sands without clogging sanding tool.

TECHNICAL DATA	
Packaging	Pail: 4.5 gal. (17 L) Carton: 3.5 gal. (13.2 L)
Approx. Coverage	123-140 lbs. (9 gal.) / 1,000 sq. ft.

ProForm® BRAND XP® with Dust-Tech®



APPLICATIONS

Use for taping, finishing joints and cornerbead, spotting fasteners, skimming and textures, and repairing cracks in plaster walls.

ADVANTAGES

- Reduces airborne dust by 60% – quick and easy clean-up.
- Resists mold growth – per ASTM G21 score of 0 (best) and ASTM D3273 score of 10 (best).
- Applies easily and provides excellent bond.
- Lessens pocking and pinholing.
- Works great for first phases of finishing.

TECHNICAL DATA	
Packaging	Pail: 61.7 lbs. (28 kg) Carton: 50 lb. (22.7 kg)
Approx. Coverage	123-140 lbs. (9 gal.) / 1,000 sq. ft.

ProForm® BRAND Ready Mix Joint Compounds

ProForm® BRAND Multi-Use



APPLICATIONS

Use for all phases of finishing, from embedding joint tape to final coats.

ADVANTAGES

- Weighs up to 20% less than standard ready mix.
- Lessens pocking and pinholing.
- Shrinks less than all-purpose formula.
- Provides excellent bond.

TECHNICAL DATA

Packaging	Pail: 4.5 gal. (17 L)
	Carton: 3.5 gal. (13.2 L)
Approx. Coverage	123-140 lbs. (9 gal.) / 1,000 sq. ft.

ProForm® BRAND All Purpose



APPLICATIONS

Use for taping, finishing joints and cornerbead, spotting fasteners, skimming and textures, and repairing cracks in plaster walls.

ADVANTAGES

- Applies easily and provides excellent bond.
- Works great for first phases of finishing.
- Stays strong – highly durable surface.
- Lessens pocking and pinholing.

TECHNICAL DATA

Packaging	Pails: 61.7 lbs. (28 kg) 12 lbs. / 1 gal. (5.4 kg)
	Cartons: 47 lb. (21.3 kg) 48 lbs. (21.8 kg) 50 lb. (22.7 kg) 61.7 lbs. (28 kg)
Approx. Coverage	123-140 lbs. (9 gal.) / 1,000 sq. ft.

ProForm® BRAND Taping



APPLICATIONS

Use for taping, adhering cornerbead and laminating gypsum board.

ADVANTAGES

- Enhances bond when embedding tape – first coating cornerbead and laminating gypsum board.
- Works well with automatic taping tools.

Taping Lite Advantages

- Lightweight. Approximately 40 percent lighter than standard taping compound.
- Great for use in taping tools.

TECHNICAL DATA	
Packaging / Taping	Pail: 61.7 lbs. (28 kg)*
Approx. Coverage / Taping	123-140 lbs. (9 gal.) / 1,000 sq. ft.
Packaging / Taping Lite	Carton: 3.5 gal. (13.2 L)
Approx. Coverage / Taping Lite	8.0-8.2 gal. (32.6-33.4 L) / 1,000 sq. ft.

*Available only in Central and Midwest regions.

ProForm® BRAND All Purpose Machine Grade



APPLICATIONS

Use for taping, finishing joints, spotting fasteners, skimming and textures, and repairing cracks in plaster walls.

ADVANTAGES

- Applies easily and provides excellent bond.
- Stays strong – highly durable surface.
- Lessens pocking and pinholing.
- Works great for first phases of finishing.
- Works well with automatic taping and finishing tools.

TECHNICAL DATA	
Packaging	Pail: 61.7 lbs. (28 kg)
	Carton: 50 lbs. (22.7 kg)
Approx. Coverage	123-140 lbs. (9 gal.) / 1,000 sq. ft.

ProForm® BRAND All Purpose Orange



ProForm®
Finishing Products

APPLICATIONS

Use for taping, finishing joints, spotting fasteners, skimming and textures, and repairing cracks in plaster walls.

ADVANTAGES

- Works well with automatic taping and finishing tools.
- Requires less water for mixing.
- Applies easily and provides excellent bond.
- Stays strong – highly durable surface.
- Lessens pocking and pinholing.

TECHNICAL DATA

Packaging	Pail: 61.7 lbs. (28 kg)*
Approx. Coverage	123-140 lbs. (9 gal.) / 1,000 sq. ft.

*Available only in the Northeast/Atlantic region.

ProForm® BRAND All Purpose Heavy Viscosity



APPLICATIONS

Use for taping, finishing joints, spotting fasteners, skimming and textures, and repairing cracks in plaster walls.

ADVANTAGES

- Applies easily and provides excellent bond.
- Stays strong – highly durable surface.
- Lessens pocking and pinholing.
- Provides all-purpose formula.

TECHNICAL DATA

Packaging	Pail: 61.7 lbs. (28 kg)
	Carton: 50 lbs. (22.7 kg)
Approx. Coverage	123-140 lbs. (9 gal.) / 1,000 sq. ft.

ProForm® BRAND Topping



APPLICATIONS

Use for finishing joints and cornerbead, spotting fasteners and textures.

ADVANTAGES

- Spreads easily.
- Lessens pocking and pinholing.
- Sands easily.

TECHNICAL DATA

Packaging	Pail: 61.7 lbs. (28 kg)
	Carton: 50 lbs. (22.7 kg)
Approx. Coverage	123-140 lbs. (9 gal.) / 1,000 sq. ft.

ProForm® BRAND Concrete-Cover Compound



APPLICATIONS

Use for smoothing and texturing monolithic concrete ceilings or columns. Concrete-Cover Compound provides a first-fill coat on fastener beads or trim and also laminates. It sprays, brushes, rolls and applies by trowel, gypsum board finishing boxes or taping tools.

ADVANTAGES

- Enhances bond when skimming to interior above-grade monolithic concrete walls, ceilings and columns.
- Creates a variety of textures.
- Dries white.
- Stays strong – highly durable surface.

TECHNICAL DATA

Packaging	Pail: 61.7 lbs. (28 kg)
	Cartons: 61.7 lbs. (28 kg) 48 lbs. (21.8 kg)
Approx. Coverage	123-140 lbs. (9 gal.) / 1,000 sq. ft.

Note: Allow concrete to cure for at least 28 days. Clip protruding wire ends and spot with rust-inhibitive primer. Remove all form of oil, grease and dirt, or any loose or water-soluble material. Grind down any form ridges, and level any remaining unevenness with ProForm® BRAND Quick Set™ Joint Compound. Apply a coat of alkali-resistant sealing primer over the entire surface to be textured.

ProForm® BRAND Joint Tapes

ProForm® BRAND Tinted-Lite Joint Compound



APPLICATIONS

Use this vinyl-based, color-tinted, lightweight ready mix for taping, filling, spotting fasteners and finishing. ProForm® Tinted-Lite Joint Compound is also ideal to repair cracks in plastered walls, texture surfaces and laminate gypsum board to other surfaces.

ADVANTAGES

- 30% lighter than ProForm® BRAND Joint Compound.
- Reduces shrinkage up to 33%.
- Lessens pocking and pinholing.
- Applies easily, provides excellent bond and superior finish.
- Pulls and sands easily.
- Covers metal beads in two coats.
- Features low volatile organic compound (VOC) content (less than 2 grams/liter)
- Use it right from the container – saving time.

TECHNICAL DATA

Packaging	Pail: 4.5 gal. (17 L)*
	Carton: 3.5 gal. (13.2 L) 4.5 gal. (17 L)
Approx. Coverage	123-140 lbs. (9 gal.) / 1,000 sq. ft.

* Available only in the Central and Midwest regions.

ProForm® BRAND Paper Joint Tape



APPLICATIONS

Use it on gypsum panel joints and interior angles, applying with the crease side in. Use it with ready mix joint compounds and embed it in ProForm® Joint Compound, removing any excess compound.

ADVANTAGES

- Creates added strength in joints.
- Provides superior bond – buffed on both sides.
- Folds at corners easily – due to center crease.
- Resists distortions, such as stretching, wrinkling and tearing.

TECHNICAL DATA

Packaging	75' (22.9 m) rolls, 20 rolls / carton 250' (76.2 m) rolls, 20 rolls / carton 500' (152.4 m) rolls, 10 rolls / carton
Approx. Coverage	375 ft. / 1,000 sq. ft. (114 m / 93 m ²) of gypsum board

ProForm® BRAND Paper Joint Tape – Heavy



APPLICATIONS

Use it with ready mix or setting-type joint compounds and gypsum veneer systems to conceal and reinforce joints of interior walls and ceilings.

ADVANTAGES

- Creates added strength in joints.
- Provides superior bond – buffed on both sides.
- Folds at corners easily – due to center crease.
- Resists stretching, wrinkling and tearing.

TECHNICAL DATA

Packaging	75' (22.9 m) rolls, 20 rolls / carton 250' (76.2 m) rolls, 20 rolls / carton 500' (152.4 m) rolls, 10 rolls / carton
Approx. Coverage	375 sq. ft. / 1,000 sq. ft. (114 m ² / 93 m ²) of gypsum board

ProForm® BRAND Fiberglass Mesh Tape



APPLICATIONS

Use on gypsum panel joints and corners. This is designed to use exclusively with setting compounds. Apply self-adhering fiberglass mesh tape to joints or corners before applying setting compounds.

ADVANTAGES

- Eliminates need for embedding coat.
- Resists mold and mildew.
- Meets ASTM C475.

TECHNICAL DATA

Packaging	300' (91.4 m) rolls, 12 rolls / carton
Approx. Coverage	375 sq. ft. / 1,000 sq. ft. (114 m ² / 93 m ²) of gypsum board

ProForm® BRAND Multi-Flex® Tape



APPLICATIONS

Use for inside and outside corners and vaulted ceilings. Apply with the metal side to the face of the gypsum panels. Embed in joint compounds.

ADVANTAGES

- Applies easily.
- Conceals and reinforces gypsum panel joints.
- Works well for hard angles – less than or greater than 90 degrees.

TECHNICAL DATA

Packaging	100' (30.5 m) rolls, 10 rolls / carton
------------------	--

TECHNICAL DATA

JOINT COMPOUND DRYING TIMES

Approximate Drying Times: All Purpose/Lite Ready Mix Joint Compound

Relative Humidity	Temperature						
	32°	40°	50°	60°	70°	80°	100°
0%	38/H	28/H	19/H	13/H	9/H	6/H	3/H
20%	2/D	34/H	23/H	16/H	11/H	8/H	4/H
40%	2.5/D	44/H	29/H	20/H	14/H	10/H	5/H
50%	3/D	2/D	36/H	24/H	17/H	12/H	6/H
60%	3.5/D	2.5/D	42/H	29/H	20/H	13.5/H	8/H
70%	4.5/D	3.5/D	2.25/D	38/H	26/H	19.5/H	10/H
80%	7/D	4.5/D	3.25/D	2.25/D	38/H	27/H	14/H
90%	13/D	9/D	6/D	4.5/D	3/D	49/H	26/H
98%	53/D	37/D	26/D	18/D	12/D	9/D	5/D

Note: D = Days (24-hour period) H = Hours

The chart above is a helpful guide in determining the approximate drying times for joint compounds under a variety of humidity/temperature conditions. Shaded area is below the minimum application temperature requirement of 50°F (10°C) and is not recommended for the application of joint compound.

MATERIALS ESTIMATING AND COVERAGE

Sq. Ft. Of Wall/Ceiling	Gypsum Board Size			All Purpose Lite Blue	Joint Tape/Ft.	Nails/Ct.
	4'x8'	4'x10'	4'x12'			
100	4	3	3	12-14 lbs. / 1.0 gal.	35	168
200	7	5	5	25-28 lbs. / 1.8 gal.	70	294
300	10	8	7	37-42 lbs. / 2.7 gal.	105	420
400	13	10	9	49-56 lbs. / 3.6 gal.	140	546
500	16	13	11	62-70 lbs. / 4.5 gal.	175	672
600	19	15	13	73-84 lbs. / 5.4 gal.	210	798
700	22	18	15	86-98 lbs. / 6.3 gal.	245	924
800	25	20	17	98-112 lbs. / 7.2 gal.	280	1,050
900	29	23	19	110-126 lbs. / 8.1 gal.	315	1,218
1,000	32	25	21	123-140 lbs. / 9.0 gal.	350	1,344
1,100	35	28	23	135-154 lbs. / 9.9 gal.	385	1,470
1,200	38	30	25	148-168 lbs. / 10.8 gal.	420	1,596
1,300	41	33	28	160-182 lbs. / 11.7 gal.	455	1,722
1,400	44	35	30	172-196 lbs. / 12.6 gal.	490	1,848
1,500	47	38	32	184-210 lbs. / 13.5 gal.	525	1,974

APPLICABLE REFERENCES AND STANDARDS

ASTM C475	<i>Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board</i>
ASTM C840	<i>Standard Specification for Application and Finishing of Gypsum Board</i>
ASTM E119	<i>Standard Test Methods for Fire Tests of Building Construction and Materials</i>
Gypsum Association, GA-214	<i>Recommended Levels of Gypsum Board Finish</i>
Gypsum Association, GA-216	<i>Application and Finishing of Gypsum Panel Products</i>
National Gypsum Company	<i>NGC Construction Guide</i>
National Gypsum Company	<i>ProForm® BRAND Interior Finishing Products Construction Guide</i>

Installation Recommendations

To ensure the best results, use only National Gypsum products together in your construction systems. We do not recommend mixing our products with other brands. All National Gypsum joint compounds are formulated without asbestos and therefore comply with Consumer Product Safety Standards.

GENERAL

Install Ready Mix Joint Compound according to the methods described in “Applicable Standards And References” and as indicated in this section. Lightly mix before using and before adding water. (Add water carefully to thin to desired consistency.) Mix with a potato-masher-type tool or with a low-speed drill.

Use directly from the container for treating fasteners and cornerbeads or for taping and finishing joints. Apply a uniformly thin layer of joint compound over the joint approximately 4 in. (102 mm) wide. Then center the tape over the joint and embed into the compound, leaving sufficient joint compound under the tape to provide a proper bond. Cover the tape with a thin coat of compound to minimize wrinkling or curling.

Reinforce ceiling, wall angles and inside corner angles with the tape folded to conform to the angle and embedded into the compound. Once the compound is thoroughly dry (approximately 24 hours), cover the joint tape with a coat of all-purpose joint compound or topping compound spread approximately 3 in. (76.2 mm) on each side and feathered out at the edges. After this coat is thoroughly dry, apply another coat of all-purpose joint compound or topping compound with a slight, uniform crown over the joint. This coat should be smooth and the edges feathered approximately 3 in. (76.2 mm) beyond the preceding coat. Coat all inside corners with at least two coats of compound with the edges feathered out.

Apply three coats of compound to all nail or screw head dimples. Apply these coats as applying each coat to the joints. Conceal flanges of gypsum board cornerbead by at least two coats of compound. The first coat should be all-purpose compound. The second coat can be all-purpose or topping compound feathered out approximately 9 in. (229 mm) on both sides of the exposed metal nose.

In cold weather (outside temperature below 50°F or 10°C), maintain temperatures within the building at a minimum of 50°F (10°C), day and night, during joint finishing. Provide adequate ventilation to eliminate excess moisture. Wet or damp conditions will slow the drying process. Subsequently, 24 hours drying time between coats may not be sufficient. Adequate drying time is essential to prevent unwanted conditions, such as cracks, from delayed shrinkage.

DECORATION

Before applying paint, wall covering or other decorating materials, all areas must be thoroughly dry and dust free and treated with a coat of good-quality, high solids, flat latex primer.

Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor.

Refer to the Gypsum Association, GA-214, *Recommended Specification for Levels of Gypsum Board Finish*, to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

SUSTAINABLE DESIGN

- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

PROFORM® BRAND XP® READY MIX WITH DUST-TECH®

ProForm® BRAND XP® Ready Mix with Dust-Tech® is designed to provide extra protection against mold and mildew compared to standard ready mix compound. When tested by an independent lab per ASTM D3273 (“Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber”), XP Ready Mix with Dust-Tech achieved a score of 10, the best possible score for this test. XP Ready Mix with Dust-Tech also resists the growth of mold per ASTM G21 (“Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi”) with a score of 0, the best possible score for this test. When tested in a system with ProForm® BRAND Paper Joint Tape, Gold Bond® BRAND XP® Gypsum Board or Gold Bond® BRAND EXP® Interior Extreme® Gypsum Panels, the XP® system achieves a score of 10 for ASTM D3273 and a score of 0 for ASTM G21. These are the best possible mold-resistant scores for these tests.

Limitations**STORAGE**

- Shelf life up to 9 months under good storage conditions (see production code date).
- Maintain temperature at a minimum 50°F (10°C) and protect container from exposure to extreme heat and sunlight to prevent spoilage and freezing.

FROZEN READY MIX

- Allow material to thaw at room temperature for at least 24 hours.
- Once thawed, turn the container upside-down for at least 15 minutes.
- Turn pail right side up, remove lid and immediately remix with an electric drill.
- Ready mix should be lump free and ready to use within 1 minute.
- Discard all ready mix that does not remix to a lump-free consistency.

STACKING

- Do not stack ready mix pails or cartons more than two pallets in height.

GENERAL

- Do not overthin ready mix.
- Do not overmix with an electric drill. This can cause undesirable changes in viscosity and in the finished surface appearance.

Handling And Project Conditions

ENVIRONMENTAL CONDITIONS

Varying weather conditions can impact both the quality and appearance of taped gypsum board joints. Relative humidity, plus temperature, will affect the working characteristics of all joint compounds.

Minimize the potential for finishing and decorating problems when temperature, humidity and airflow remain constant and as close to occupancy environmental conditions as possible. Continuously maintain a minimum temperature of 50°F (10°C) for 48 hours prior to and throughout the finishing process until applied materials are thoroughly dry.

For example, cool, wet weather will slow down the drying process while hot, dry weather hastens the drying process. Exposure to winds, breezes or drafts while drying can also affect the performance of joint compounds. Typical problems from improper drying can be cracking, excessive shrinkage, ridging and beading, banding or bond failure. A further explanation of these conditions is outlined in the “Problems And Solutions” section of the ProForm® BRAND *Interior Finishing Products Construction Guide*.

Always take proper precautions at the jobsite to minimize the adverse effects of weather on drying. These precautions will ultimately reduce the application time and expense from callbacks and rework.

PLANNING AND PREVENTION: MOLD AND MILDEW RESISTANCE

Planning and prevention is the most effective way to avert the growth of mold or mildew. Deliver gypsum board and finishing products to a jobsite as near to the time they will be used as possible. Once delivered to a jobsite, place gypsum board under cover immediately and properly protect it. Do not expose it to outside elements, such as rain, snow or other high moisture conditions. If building materials get wet from any moisture source, identify and correct that source. If mold or mildew growth occurs, or if you suspect it might occur due to environmental conditions and moisture, either attempt to dry and clean the affected areas or replace the affected materials. If you do not have the training or experience to recognize and to make the proper decisions about repair or removal, consult a professional. A proper evaluation must be made.

No material can be considered “mold-proof,” nor is it certain that any material will resist mold or mildew indefinitely. When used in conjunction with good design, handling and construction practices, XP® Ready Mix with Dust-Tech® can provide increased mold resistance versus standard ready mix compounds. As with any building material, avoid water exposure during handling, storage, installation and after installation is complete. This is the best way to avoid the formation of mold or mildew.

Five Levels Of Finish For Gypsum Board

LEVEL 0

Typically specified in temporary construction or whenever the final decoration has not been determined.

No taping, finishing or accessories required.

LEVEL 1

Typically specified joint treatment in smoke barrier applications and areas not normally open to public view, such as plenum areas above ceilings, attics, and other areas where the assembly would generally be concealed.

All joints and interior angles shall have tape embedded in joint compound. Excess joint compound, tool marks and ridges are acceptable.

Accessories are optional unless specified in the project documents.

LEVEL 2

Typically specified where gypsum panel products are used as a substrate for tile; may be used in garages, warehouse storage or other similar areas where surface appearance is not a concern.

All joints and interior angles shall have tape embedded in joint compound and wiped with a joint knife, leaving a thin coating of joint compound over all joints and interior angles. Joint compound applied over the body of the tape at the time of tape embedment shall be considered a separate coat of joint compound and shall satisfy the conditions of this level.

Fastener heads and accessories shall be covered with one (1) coat of joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.

LEVEL 3

Typically specified in appearance areas which are to receive heavy- or medium-texture finishes (spray or hand applied) before final painting, or where heavy duty/commercial-grade wallcoverings are to be applied as the final decoration. The design professional shall specify the mock-up procedure and mock-up construction details within the project documents. This level of finish is not recommended for smooth wall designs or applications where light textures, non-continuous textures or lightweight wallcoverings are applied.

All joints and interior angles shall have tape embedded in joint compound and shall be immediately wiped with a joint knife, leaving a thin coating of joint compound over all joints and interior angles. One (1) separate coat of joint compound shall be applied over all joints and interior angles. Fastener heads and accessories shall be covered with two (2) separate coats of joint compound. The surface shall be smooth and free of tool marks and ridges.

Jobsite mock-up(s) shall be used to determine acceptance of the finish within the building.

Note: It is recommended that the final decoration specification (e.g., painting specification) include the application of a priming material prior to the decoration.

LEVEL 4

Typically specified in appearance areas where smooth wall designs are decorated with flat paints, light textures, non-continuous textures or wallcoverings are to be applied. The design professional shall specify the mock-up procedure and mock-up construction details within the project documents. This level of finish is not recommended where non-flat or dark/deep tone paints are applied.

In critical lighting areas, flat paints applied over light continuous textures tend to reduce joint photographing.

The weight, texture and sheen of wallcoverings applied over this level of finish should be carefully evaluated. Joints and fasteners must be adequately concealed if the wallcovering used is of lightweight construction, contains limited pattern, has a sheen level other than flat, or any combination thereof. Unbacked vinyl wallcoverings are not recommended over this level of finish.

All joints and interior angles shall have tape embedded in joint compound and shall be immediately wiped with a joint knife, leaving a thin coating of joint compound over all joints and interior angles. Two (2) separate coats of joint compound shall be applied over all flat joints and one (1) separate coat of joint compound shall be applied over interior angles. Fastener heads and accessories shall be covered with three (3) separate coats of joint compound. The surface shall be smooth and free of tool marks and ridges.

Where glass mat and/or fiber-reinforced gypsum panels are installed, refer to the gypsum panel manufacturer for specific finishing recommendations.

Jobsite mock-up(s) shall be used to determine the acceptance of the finish within the building.

Note: It is recommended that the final decoration specification (e.g., painting specification) include the application of a priming material prior to the decoration.

LEVEL 5

Typically specified in appearance areas where smooth wall designs are decorated with non-flat paints (i.e., sheen/gloss) or other glossy decorative finishes, dark/deep tone paints are applied, or critical lighting conditions occur. The design professional shall specify the mock-up procedure and mock-up construction details within the project documents. This level of finish is the most effective method to provide a uniform surface and minimize the possibility of joint photographing and/or fasteners showing through the final decoration.

All joints and interior angles shall have tape embedded in joint compound and shall be immediately wiped with a joint knife, leaving a thin consistent coating of joint compound over all joints and interior angles. Two (2) separate coats of joint compound shall be applied over all flat joints and one (1) separate coat of joint compound shall be applied over interior angles. Fastener heads and accessories shall be covered with three (3) separate coats of joint compound. A thin skim coat of joint compound (see "Skim Coat" in Comments) or a material manufactured especially for this purpose shall be applied to the entire surface. The surface shall be smooth and free of tool marks and ridges.

Where glass mat and/or fiber-reinforced gypsum panels are installed, refer to the gypsum panel manufacturer for specific finishing recommendations.

Jobsite mock-up(s) shall be used to determine acceptance of the finish within the building.

Note: It is recommended that the final decoration specification (e.g., painting specification) include the application of a priming material prior to the decoration.

For more information, refer to the Gypsum Association document, GA-214.



0
No taping, finishing or accessories required.

1
All joints and interior angles have tape set in compound.

2
Thin coating of compound over all joints and interior angles.

3
Additional coating of compound over joints and interior angles. Smooth and free of tool marks and ridges.

4
Another coating of compound over flat joints, smooth and free of tool marks or ridges.

5
Skim coat applied over entire surface. Surface smooth and free of tool marks or ridges.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



ProForm® BRAND

Quick Set™

Setting Compounds

PROFORM
BRAND
Interior Finishing Products

ProForm®
Finishing Products



ProForm® BRAND Interior Finishing Products provide the right ready mix or setting compounds to finish your complex projects. ProForm® offers high-quality, consistent formulas that are easy to apply, saving you time and effort. Do you need superior bonding, excellent sanding characteristics, lightweight formulas and quick set times? You can depend on ProForm. Select products even offer added mold resistance or help reduce airborne dust.

National 
Gypsum®

ProForm® BRAND Quick Set™ Setting Compounds

ProForm® BRAND Quick Set™ Compound



APPLICATIONS

Use for heavy fills, beads, trims, joint finishing and laminating gypsum panels.

ADVANTAGES

- Streamlines scheduling – recoat immediately once previous coat sets.
- Allows more open time.
- Provides excellent bond.
- Stays strong/highly durable surface.
- Shrinks less and dries white.
- Allows easy mixing.
- Added protection against mold.

TECHNICAL DATA

Packaging	Bag: 25 lbs. (11.3 kg)
Approx. Coverage	45-55 lbs. (22-29 kg) / 1,000 sq. ft. (93 m ²)
Mixing	13-14 pts. (6.2-6.6 L) clean, room temperature, drinkable water per bag.

ProForm® BRAND Quick Set™ Lite Compound



APPLICATIONS

Use for heavy fills, beads, trims, joint finishing and laminating gypsum panels.

ADVANTAGES

- 30% lighter than Quick Set Compound.
- Streamlines scheduling – recoat immediately once previous coat sets.
- Provides excellent bond.
- Stays strong/highly durable surface.
- Shrinks less and dries white.
- Allows easy mixing and sanding.
- Added protection against mold.

TECHNICAL DATA

Packaging	Bag: 18 lbs. (18.2 kg)
Approx. Coverage	45-55 lbs. (22-29 kg) / 1,000 sq. ft. (93 m ²)
Mixing	11-12 pts. (5.2-5.5 L) clean, room temperature, drinkable water per bag.

ProForm® BRAND FS-90 Fire-Shield® Compound (Through-Penetration Fire Stop)



APPLICATIONS

Meets multiple standards to qualify as UL Listed to use: in fire and smoke-stop; for through-wall and floor penetrations; for head of wall.

ADVANTAGES

- Blocks fire and smoke – dries red for easy identification.
- Saves money – more economical and less waste than caulking tube products.
- Reduces waste – mix only what you need for the job.

TECHNICAL DATA	
Packaging	Bag: 25 lbs. (11.3 kg)
Approx. Coverage	850 cu. in.
Mixing	12-13 pts. (5.7-6.2 L) clean, room temperature, drinkable water per bag. If less than a full bag is used, mix at a ratio of 2 parts dry powder to 1 part water.

ProForm® BRAND Paper Joint Tape



APPLICATIONS

Use it on gypsum panel joints and interior angles, applying with the crease side in. Use it with ready mix joint compounds and embed it in ProForm® Joint Compound, removing any excess compound.

ADVANTAGES

- Creates added strength in joints.
- Provides superior bond – buffed on both sides.
- Folds at corners easily – due to center crease.
- Resists distortions, such as stretching, wrinkling and tearing.

TECHNICAL DATA	
Packaging	75' (22.9 m) rolls, 20 rolls / carton 250' (76.2 m) rolls, 20 rolls / carton 500' (152.4 m) rolls, 10 rolls / carton
Approx. Coverage	375 ft. / 1,000 sq. ft. (114 m / 93 m ²) of gypsum board

ProForm® BRAND Quick Set™ Setting Compounds

ProForm® BRAND Paper Joint Tape – Heavy



APPLICATIONS

Use it with ready mix or setting-type joint compounds and gypsum veneer systems to conceal and reinforce joints of interior walls and ceilings.

ADVANTAGES

- Creates added strength in joints.
- Provides superior bond – buffed on both sides.
- Folds at corners easily – due to center crease.
- Resists stretching, wrinkling and tearing.

TECHNICAL DATA

Packaging	75' (22.9 m) rolls, 20 rolls / carton 250' (76.2 m) rolls, 20 rolls / carton 500' (152.4 m) rolls, 10 rolls / carton
Approx. Coverage	375 ft. / 1,000 sq. ft. (114 m / 93 m ²) of gypsum board

ProForm® BRAND Fiberglass Mesh Tape



APPLICATIONS

Use on gypsum panel joints and corners. This is designed to use exclusively with setting compounds. Apply self-adhering fiberglass mesh tape to joints or corners before applying setting compounds.

ADVANTAGES

- Eliminates need for embedding coat.
- Resists mold and mildew.
- Meets ASTM C475.

TECHNICAL DATA

Packaging	300' (91.4 m) rolls, 12 rolls / carton
Approx. Coverage	375 ft. / 1,000 sq. ft. (114 m / 93 m ²) of gypsum board

ProForm® BRAND Multi-Flex Tape



APPLICATIONS

Use for inside and outside corners and vaulted ceilings. Apply with the metal side to the face of the gypsum panels. Embed in joint compounds.

ADVANTAGES

- Applies easily.
- Conceals and reinforces gypsum panel joints.
- Works well for hard angles – less than or greater than 90 degrees.

TECHNICAL DATA

Packaging	100' (30.5 m) rolls, 10 rolls / carton
Approx. Coverage	100 linear ft. / roll

TECHNICAL DATA

FS-90 FIRE-SHIELD® COMPOUND FIRE-RESISTANCE RATINGS					
Penetrating Item	Annular Space	Hole Size Max.	F Rating	T Rating	UL System No.
2-Hour Wall Systems					
Min. 10-33% Max. Fill No. 24 AWG Cable	Min. 1/4" (6.4 mm) Max. 4-1/2" (114 mm)	6" (152 mm)	2 Hr.	0 Hr.	WL3035
4" dia. (102 mm) EMT Pipe or Steel Pipe	Min. 1/4" (6.4 mm) Max. 2-1/2" (63.6 mm)	7" (178 mm)	2 Hr.	0 Hr.	WL1041
3" dia. (76.2 mm) Copper Pipe	Min. 1/4" (6.4 mm) Max. 2-1/2" (63.6 mm)	6" (152 mm)	2 Hr.	0 Hr.	WL1041
3-Hour Wall Systems					
Steel Sleeve, Nom. 6" dia. (152 mm) or Smaller Electrical Metallic Tubing, Conduit or Pipe Schedule 40 (or Heavier)	Max. 1/4" (6.4 mm)	6" (152 mm)	3 Hr.	0 Hr.	CAJ0038
Steel Pipe, Nom. 4" dia. (102 mm) or Smaller Schedule 40 (or Heavier)	Min. 1/2" (12.7 mm) Max. 3" (76.2 mm)	8" (203 mm)	3 Hr.	0 Hr.	CAJ1163
10-40% Fill No. 24 AWG Cables, Nom. 6" dia. (152 mm) Metallic Sleeve (Optional)	Min. 1/2" (12.7 mm) Max. 3-1/2" (88.9 mm)	6" (152 mm)	3 Hr.	0 Hr.	CAJ3073

Tested in accordance with the standard ANSI/UL1479 and ASTM E814.

MATERIALS ESTIMATING AND COVERAGE							
Sq. Ft. Of Wall/Ceiling	Gypsum Board Size			Quick Set/Lb.	Joint Tape/Ft.	Nails/Ct.	Screws/Ct.
	4'x8'	4'x10'	4'x12'				
100	4	3	3	6	35	168	90
200	7	5	5	11	70	294	150
300	10	8	7	17	105	420	240
400	13	10	9	22	140	546	300
500	16	13	11	28	175	672	390
600	19	15	13	33	210	798	456
700	22	18	15	39	245	924	528
800	25	20	17	44	280	1,050	600
900	29	23	19	50	315	1,218	696
1,000	32	25	21	55	350	1,344	768
1,100	35	28	23	61	385	1,470	840
1,200	38	30	25	66	420	1,596	912
1,300	41	33	28	72	455	1,722	984
1,400	44	35	30	77	490	1,848	1,056
1,500	47	38	32	83	525	1,974	1,128

APPROXIMATE WORKING TIME vs. SET HARDENING TIME		
Quick Set/ Quick Set Lite	Working Time (Minutes)	Set/Hardening Time (Minutes)
5	3-5	10-20
20	15-20	20-40
45	35-45	45-70
90	70-90	90-125
210	180-210	210-280

PARTITION / DECK INTERSECTION SYSTEMS	
Description	Test Reference
1-Hour Partition/Fluted Deck Juncture	WHI495-P5V1067
2-Hour Partition/Fluted Deck Juncture	WHI495-P5V1068
1-Hour Deflection Track/ Fluted Deck Juncture	WHI495-P5V1063
2-Hour Deflection Track/ Fluted Deck Juncture	WHI495-P5V1064

ProForm® FS-90 Fire-Shield® Compound (Through-Penetration Fire Stop)

ProForm® FS-90 Fire-Shield® Compound is a setting/hardening compound that provides protection in fire-stopping penetrations through fire-rated partitions or assemblies. It also seals out smoke, toxic gas and water to provide a barrier to stop sound and dust infiltration. It is tinted reddish/pink to distinguish it from other joint treatment products.

Installation Recommendations

To ensure the best results, use only National Gypsum products together in your construction systems. We do not recommend mixing our products with other brands. All National Gypsum setting joint compounds and joint tapes are formulated without asbestos and therefore comply with Consumer Product Safety Standards.

GENERAL

Use Quick Set™ Lite Compound for finishing joints on exterior soffit board and gypsum panel products in sheltered exterior ceiling and soffit areas. Do not use it in exterior application on walls. Install Quick Set Lite according to the methods described in "Applicable Standards And References" and as indicated in this section.

In cold weather (outside temperature below 50°F or 10°C), maintain temperatures within the building at a minimum of 50°F (10°C), day and night, during joint finishing. Provide adequate ventilation to eliminate excess moisture.

CONVENTIONAL TAPING AND FINISHING

Taping: Fill joint and embed tape simultaneously. Fill all flat gypsum board and tape in one operation with Quick Set Lite, using ProForm® Paper Tape in the conventional manner. When using ProForm® Fiberglass Mesh Tape, firmly press it to the gypsum board, spanning the joints. Then immediately apply Quick Set Lite to the joints. Force the compound through the tape to fill the joint. Tape all inside corners using the appropriate joint compounds. Use Quick Set Lite for the first coat on nail or screw heads to decrease problems with fastener imperfections. If employing a two-trip application method, you may use Quick Set Lite for the first coat on cornerbead and to tape inside corners.

First Finishing Coat: As soon as the Quick Set Lite used for taping has hardened, you may apply the first finishing coat on the flat joints even before they are dry. Use any joint compound for this operation, including Quick Set Lite and ProForm® Ready Mix Joint Compounds. You may apply a second coat at this time to nail or screw heads; one coat on one side of the inside corners and a second coat on the cornerbead if Quick Set Lite was used on the first coat.

Second Finishing Coat: As soon as Quick Set Lite used for the previous step has set, or the ready mix compound has thoroughly dried, apply a second finishing coat to all joints. Apply a third coat over nail or screw heads and on cornerbead as required. At this time, finish the unfinished side of the inside corners.

TAPING AND FINISHING WITH MECHANICAL TOOLS

Taping: Use taping tools, such as the "banjo" and "hopper" types, for taping the flat joints with Quick Set Lite and the inside corners with regular or Quick Set Lite. Do not use automatic taping tools with Quick Set Lite because it is difficult to clean the hardening-type compounds from the tools. Use mechanical tools for taping the inside corners when using a regular joint compound. When using automatic taping tools for taping the flat joints, prefill the flat joints and all the space between the gypsum board edges on the butt joints with Quick Set Lite and allow it to harden (30 minutes longer than the set time designated on the bag) before taping with a regular joint compound.

Finishing: When using conventional finishing compounds, you may use mechanical-type finishing tools in the normal manner for finishing operations. For more information on finishing gypsum board installations, see page 264.

Concrete: You must properly prepare interior poured concrete ceilings prior to filling and finishing. Grind high areas in concrete level with surrounding areas. Remove efflorescence, greasy deposits and any form of oil. Prime exposed metal with a quality, rust-inhibitive primer. Fill voids and level offsets with Quick Set Lite. Apply finishing coats of Quick Set Lite as needed after each coat has hardened.

MIXING

Do not mix more compound than you can apply in the designated set time. Consult the compound packaging for the mixing ratio. Use only clean, drinkable water. Place the designated amount of water in a clean mixing container. Add the compound gradually to the water while stirring. Use a mechanical mixer or your hands

to mix the compound until it is lump free. Allow standing (soak) for 1 minute, and then remix it until the consistency is smooth and creamy. If you want a thinner or thicker mix, add water or powder sparingly. Be careful not to overmix as it could lead to shortened working times. DO NOT mix with any other joint compounds (wet or dry) and do not use in automatic tools. Before applying, the surface areas should be clean and free of dust and debris.

ESTIMATED WORKING TIME AND SETTING TIME

To select the best ProForm® Quick Set™ Joint Compound for your project, you must match its working time and setting time ranges. Working time and setting time are not the same.

WORKING TIME

Working time refers to the window of time available to apply ProForm Quick Set Compound once it is ready. At the end of this time, the material begins to stiffen and is no longer easy to spread. Working time should correspond to the required time for actual application.

SETTING TIME

Setting time refers to the window of time after you apply ProForm Quick Set Compound and it has become hard enough to apply another layer. For manufactured or modular builders, the setting time should match your timetable for moving a floor along the line.

APPLYING JOINT AND CORNER FINISHING

1. Mix ProForm® Quick Set™ Compounds according to the printed instructions on the package.
2. Apply a uniformly thin layer of joint compound over the joint approximately 4 in. (102 mm) wide. Then center the tape over the joint and embed into the compound, leaving sufficient joint compound under the tape to provide a proper bond. Reinforce ceiling, wall angles and inside corner angles with the tape folded to conform to the angle and embedded into the compound.
3. Once the compound is thoroughly dry (approximately 24 hours for regular compound or 2 hours for Quick Set), cover the joint tape with a coat of all-purpose joint compound or topping compound spread approximately 3 in. (76.2 mm) on each side

and feathered out at the edges. After this coat is thoroughly dry, apply another coat of all-purpose joint compound or topping compound with a slight, uniform crown over the joint. This coat should be smooth and the edges feathered approximately 3 in. (76.2 mm) beyond the preceding coat.

4. Coat all inside corners with at least one coat of joint or topping compound with the edges feathered out.
5. Apply three coats of compound to all nail or screw head dimples. Apply these coats as applying each coat to the joints.
6. Conceal flanges of gypsum board cornerbead by at least two coats of compound. The second coat should be feathered out approximately 9 in. (229 mm) on both sides of the exposed metal nose.
7. Fill joint and bed tape simultaneously for joint and corner treatment with Quick Set Compound. After Quick Set has hardened, apply any ProForm® Joint Compound.
8. For wet sanding, allow each application of compound to dry or harden. If dry sanding, ventilate the work area and/or use a NIOSH/MSHA-approved respirator. We also recommend using safety glasses. Use caution to avoid roughing the gypsum board paper. All gypsum board and treated areas should be smooth and ready for decoration.

DECORATION

Before applying paint, wallcovering or other decorating materials, all areas must be thoroughly dry and dust free and treated with a coat of good-quality, high solids, flat latex primer.

Selection of paint to provide desired finish characteristics is the responsibility of the architect or contractor.

Refer to the Gypsum Association, GA-214, *Recommended Specification for Levels of Gypsum Board Finish*, to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

FINISHING

For more information on finishing gypsum board installations, refer to page 264.

SUSTAINABLE DESIGN

- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Limitations

- Do not apply over moist surfaces or surfaces subject to direct moisture.
- Do not mix with any other material. Use only clean, room temperature, drinkable water.
- Mixing equipment and tools must be thoroughly cleaned between batches.
- Each fresh batch of compound must be kept free of previous batches; otherwise the working time will be shortened.
- High-speed mixing or excessive mixing will shorten the working time of the ProForm® Quick Set™ Compounds.
- Do not add water or remix after compound begins to thicken and harden.
- Do not use in automatic taping tools.

Handling And Project Conditions

ENVIRONMENTAL CONDITIONS

Close an opened bag as tight as possible for storage or it may affect the setting time. The shelf life is up to 6 months in high humidity areas and 12 months under good storage conditions (see production date code). Maintain the temperature at a minimum of 50°F (10°C) and protect the container from exposure to extreme heat, sunlight and water to prevent spoilage and freezing. Minimize the potential for finishing and decorating problems when temperature, humidity and airflow remain constant and as close to occupancy environmental conditions as possible. Continuously maintain a minimum temperature of 50°F (10°C) for 48 hours prior to and throughout the finishing process until applied materials are thoroughly dry.

MIXING

ProForm® Quick Set™ Lite is available in 5, 20, 45, 90 and 210 minute set times. Do not mix more compound than you can apply in the designated set time. Use a plastic container for mixing because it is easy to clean between batches. Do not use a wood or an aluminum bucket. Add the compound gradually to clean water while stirring. Use only fresh, clean water suitable for drinking. Mix at the ratio of 11-12 pints (5.2-5.7 L) of water to the 18 lb. (8.2 kg) bag. Use a mechanical mixer or your hands to mix the compound until it is lump free. (We recommend using a mechanical mixer.) Allow the compound to stand as a “wetting” period and remix to further improve the working qualities. If you want a slightly thinner or thicker compound after mixing, add water or powder sparingly. Close the opened bag as tight as possible or it may affect setting time.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



Texture Products

PROFORM
BRAND
Interior Finishing Products

ProForm®
Finishing Products



ProForm® BRAND Interior Finishing Products provide the right ready mix, setting compounds and textures to finish your complex projects. ProForm® offers high-quality, consistent formulas that are easy to apply, saving you time and effort. Do you need superior bonding, excellent sanding characteristics, lightweight formulas and quick set times? You can depend on ProForm. Select products even offer added mold resistance or help reduce airborne dust.

National 
Gypsum®

ProForm® BRAND Perfect Spray Medium (Aggregated Texture Spray)



APPLICATIONS

Use on interior ceilings with new, primed or previously painted gypsum board or monolithic concrete/plaster. Works with standard spray equipment.

ADVANTAGES

- Mixes easily and provides low fallout.
- Achieves bright white appearance – providing bold accent and hiding minor surface defects.
- Contains shredded polystyrene aggregate – sprays quickly.

TECHNICAL DATA

Packaging	Bag: 40 lbs. (18.2 kg)
Approx. Coverage	300-400 sq. ft. (27-37 m ²) / Bag
Mixing	3-4 gal. (11.3-15.1 L) clean, room temperature, drinkable water per bag.

ProForm® BRAND Wall & Ceiling Spray (Non-Aggregated Texture Spray)



APPLICATIONS

Use on walls and ceilings. Also use on a wall surface finished with a coat of paint or concrete coated with an alkali-resistant primer/sealer. This applies without overspray impacting the ceiling.

ADVANTAGES

- Pumps easily.
- Creates a variety of textures, including spray spatter, spatter knockdown and orange peel.
- Offers textures in several light-reflecting finishes.

TECHNICAL DATA

Packaging	Bag: 50 lbs. (22.7 kg)
Approx. Coverage	500-1,500 sq. ft. (46-139 m ²) / Bag
Mixing	4-5 gal. (15-19 L) clean, room temperature, drinkable water per bag.

ProForm® BRAND All Purpose Texture Grade



APPLICATIONS

Use for any non-aggregated texture. Works for a variety of textures, including stipple, knockdown, skip trowel and orange peel.

ADVANTAGES

- Allows great pattern versatility.
- Conceals minor cracks and other imperfections.
- Applies easily and provides excellent bond.

ProForm®
Finishing Products

TECHNICAL DATA

Packaging	Bag: 40 lbs. (18.2 kg)
Approx. Coverage	123-140 lbs. (9 gal.) / 1,000 sq. ft. (93 m ²)

Installation Recommendations

To ensure the best results, use only National Gypsum products together in your construction systems. We do not recommend mixing our products with other brands. All National Gypsum texture products are formulated without asbestos and therefore comply with Consumer Product Safety Standards.

SPRAY TEXTURES ON GYPSUM BOARD

All surfaces, including joint-treated areas, must be smooth, clean and dry. First, apply a coat of sealing primer. Allow primer to dry thoroughly, and maintain adequate drying conditions after application. Primer helps to minimize sagging of gypsum board and discoloration or difference in the sheen on the ceiling surface. Add dry texture to water. Use a piston pump or Mono-type pump with a texture gun. (Minimum 3/4 in. or 19.1 mm I.D. Material Hose.) A hopper-type gun with adequate air supply is also suitable. Typical coverage is 8-10 sq. ft. per lb. for aggregated and 10-30 sq. ft. per lb. for non-aggregated textures. Mask appropriate areas before spraying and promptly remove overspray from unprotected surfaces afterward. Follow the instructions of the spray equipment manufacturer for adjusting controls and cleaning. If a second coat is desired, allow the first coat to dry thoroughly.

To decorate gypsum board ceiling surfaces with water-thinned spray texture, apply 1/2 in. (12.7 mm) or 5/8 in. (15.9 mm) thick and perpendicular to the framing. Framing should not exceed 16 in. (406 mm) o.c. for Gold Bond® BRAND 1/2 in. (12.7 mm) Gypsum Board and 24 in. (610 mm) o.c. for 1/2 in. (12.7 mm) High Strength™ Ceiling Board and Gold Bond® BRAND 5/8 in. (15.9 mm) Gypsum Board.

SPRAY TEXTURES ON CONCRETE

Allow concrete to cure for at least 28 days. Clip protruding wire ends and spot with rust-inhibitive primer. Remove all form of oil, grease and dirt, or any loose or water-soluble material. Grind down any form ridges, and level any remaining unevenness with ProForm® BRAND Quick Set™ Joint Compound. Apply a coat of alkali-resistant sealing primer over the entire surface to be textured.

TECHNICAL DATA

FINISHING MATERIALS	
	Quantity Per 1,000 sq. ft. of Gypsum Board
All-Purpose/Lite Blue	123-140 lbs./9.0 gal.
Quick Set	55 lbs.
Perfect Spray	120 lbs.
Wall & Ceiling Spray	50-100 lbs.
Joint Tape	350 ft.

SUSTAINABLE DESIGN

- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



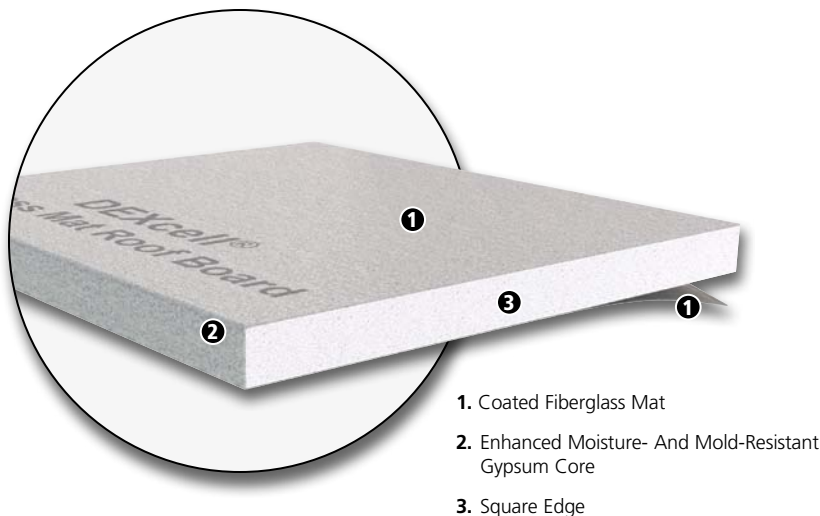
Glass Mat

Roof Board

DEXcell® BRAND Glass Mat Roof Board has coated fiberglass facers and an enhanced mold-resistant gypsum core. This mold- and moisture-resistant gypsum panel is a substrate board, thermal barrier and/or coverboard for commercial roofing applications. It scores and cuts easily, and is specially coated on the front, back and sides for easy handling.

Use it for a wide variety of roofing systems, including mechanically attached and ballasted single-ply membranes, thermal barriers and metal roofing.

Sizes: 1/4 in. (6.4 mm), 1/2 in. (12.7 mm) and 5/8 in. (15.9 mm) thick boards are available in 4 ft. (1,219 mm) widths and in standard lengths of 4 ft. (1,219 mm) and 8 ft. (2,438 mm).



1. Coated Fiberglass Mat
2. Enhanced Moisture- And Mold-Resistant Gypsum Core
3. Square Edge

DEXcell®
BRAND
Glass Mat Roof Board

National 
Gypsum®

Basic Uses

APPLICATIONS

- Use DEXcell® Glass Mat Roof Board as a substrate board and for thermal protection in roofing assemblies. It provides increased fire safety and acoustical enhancement. It also serves as a substrate for a vapor retarder and/or continuous substrate for the application of roofing membranes. This board provides increased moisture, mold and impact resistance.
- Use it as an insulation cover board in roofing assemblies. DEXcell Glass Mat Roof Board protects and supports the roof membrane; provides increased fire, moisture and mold resistance; and reduces the potential for penetration damage to the membrane.

ADVANTAGES

- Scores and snaps easily.
- Fiberglass mat on face and back has special coating for easy handling.
- Meets ASTM C1177.
- Meets FM Class 1 and UL Class A fire ratings for roofing systems up to unlimited slope per UL 790.
- Approved component in specific UL fire-rated designs.
- Use it as part of a class A, B or C roof covering that has been tested in accordance with UL 1256 or FM 4450. No additional thermal barrier is required as per IBC 2603.4.1.5.
- Anti-microbial per ASTM D6329.
- Resists the growth of mold per ASTM D3273 with a score of 10, the best possible score.
- High-density coverboard/thermal barrier.

Installation Recommendations

GENERAL

- Install roof boards in accordance with methods described in the standards and references cited in this document.
- Examine and inspect deck substrate to which roof boards are to be applied. Remedy all defects prior to installation of the roof boards.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Install fire-rated assemblies in accordance with the details found in the UL Fire Resistance Directory: ul.com.
- See Physical Properties chart for maximum flute span when panels are applied directly over metal decking.

WIND UPLIFT

DEXcell Glass Mat Roof Boards are included in numerous assemblies evaluated by Factory Mutual Global (FMG) and other independent laboratories for wind-uplift performance. For information concerning such assemblies, visit: roofnav.com.

Refer to roof system manufacturer's written instructions, local code requirements, Factory Mutual Global (FMG) and Underwriters Laboratories (UL) requirements for proper installation techniques.

- Use fasteners or adhesives specified in accordance with system requirements. Install approved fasteners with plates into the DEXcell Glass Mat Roof Board. Install fasteners and adhesives in compliance with the roof system manufacturer's installation recommendations and FMG *Property Loss Prevention Data Sheet 1-29*. Proper fastener spacing or adhesive application is essential to achieve wind-uplift performance.
- Locate board edge joints on, and end joints parallel to, metal deck ribs. Stagger end joints of adjacent lengths of DEXcell Glass Mat Roof Board. In typical installations, butt board edges and ends loosely.

TECHNICAL DATA

PHYSICAL PROPERTIES			
	1/4" DEXcell Glass Mat	1/2" DEXcell Glass Mat	5/8" DEXcell Glass Mat
Thickness¹, Nominal	1/4" (6.4 mm)	1/2" (12.7 mm)	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm)	4' (1,219 mm)	4' (1,219 mm)
Length¹, Standard	4' (1,219 mm), 8' (2,438 mm)	4' (1,219 mm), 8' (2,438 mm)	4' (1,219 mm), 8' (2,438 mm)
Weight, Nominal	1.2 lbs. / sq. ft. (5.9 k/m ²)	2.0 lbs. / sq. ft. (10 k/m ²)	2.5 lbs. / sq. ft. (12 k/m ²)
Edges¹	Square	Square	Square
Flexural Strength¹, Parallel	≥ 40 lbf. (178 N)	≥ 80 lbf. (356 N)	≥ 100 lbf. (445 N)
Humidified Deflection¹	N/A	≤ 2/8" (6.4 mm)	≤ 1/8" (3.2 mm)
Nail Pull Resistance¹	≥ 40 lbf. (178 N)	≥ 80 lbf. (356 N)	≥ 90 lbf. (400 N)
Hardness¹ – Core, Edges and Ends	≥ 15 lbf. (67 N)	≥ 15 lbf. (67 N)	≥ 15 lbf. (67 N)
Bending Radius	4' (1,219 mm)	6' (1,829 mm)	8' (2,438 mm)
Thermal Resistance⁴	R = .23	R = .43	R = .5
Permeance⁵	25 perms	24 perms	23 perms
Water Absorption⁴ (% of Weight)	≤ 10%	≤ 10%	≤ 10%
Surfacing	Coated Fiberglass	Coated Fiberglass	Coated Fiberglass
Flute Spanability⁶	2-5/8" (66.7 mm)	5" (127 mm)	8" (203 mm)
Compressive Strength⁷	900 psi	900 psi	900 psi
Mold Resistance⁸	Score of 10	Score of 10	Score of 10
Product Standard Compliance	ASTM C1177	ASTM C1177	ASTM C1177
Fire-Resistance Characteristics			
Core Type	Regular	Regular	Type X
UL Type Designation	DEXcell Glass Mat Roof Board	DEXcell Glass Mat Roof Board	DEXcell Glass Mat Roof Board
Combustibility²	Non-combustible Core	Non-combustible Core	Non-combustible Core
Surface Burning Characteristics³	Class A	Class A	Class A
Flame Spread³	0	0	0
Smoke Development³	0	0	0
Fire Classification	UL Classified, FM Approved	UL Classified, FM Approved	UL Classified, FM Approved
Applicable Standards and References			
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products			
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus			
ASTM C1177 Standard Test Method for Glass Mat Gypsum Substrate for Use as Sheathing			
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber			
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials			
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials			
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C			
ASTM E661 Standard Test Method for Performance of Wood and Wood-Based Floor and Roof Sheathing Under Concentrated Static and Impact Loads			
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>			
National Gypsum Company, <i>NGC Construction Guide</i>			

1. Specified values per ASTM C1177, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Tested in accordance with ASTM C518.

5. Tested in accordance with ASTM E96.

6. Tested in accordance with ASTM E661.

7. Tested in accordance with ASTM C473, annex X3.

8. Tested in accordance with ASTM D3273.

SAFETY

Installers should wear long pants and a long-sleeved, loose fitting shirt. Use protective gloves and special eye protection (goggles or safety glasses with side shield). Do not use a power saw to cut these products.

Caution: Because this product contains fiberglass, dust and glass fibers may be released during normal handling, which could result in eye or skin irritation or cause difficulty in breathing. Whenever possible, avoid contact with the skin and eyes and avoid breathing dust or fibers that may be released during installation. Consult the SDS for this product, available at: nationalgypsum.com before use.

Fire-Resistance Ratings

Fire and sound ratings for building systems utilizing glass mat gypsum roof boards are dependent on the thickness of the roof board, its application in conjunction with other roof assembly parts, and the manner in which the assembly is installed.

Tests for fire resistance and sound transmission performed by independent laboratories have resulted in specific ratings for roof assemblies. For maximum fire resistance and sound control, use double-layer construction. The additional mass further retards heat and noise penetration.

Fire-resistance ratings represent the results of tests on assemblies made up of specific materials in a specific configuration. When selecting construction designs to meet certain fire-resistance requirements, use caution to ensure that each component of the assembly is the one specified in the test. Further, take precaution that assembly procedures are in accordance with those of the tested assembly. For copies of specific tests, call 1-800-NATIONAL. For fire-safety information, see: nationalgypsum.com.

- DEXcell® Glass Mat Roof Board meets UL Class A fire ratings for roofing systems up to unlimited slope per UL 790; refer to UL Certifications Directory: ul.com.
- DEXcell Glass Mat Roof Board is classified in roof deck constructions in accordance with ANSI/ UL 1256; refer to UL Certifications Directory: ul.com.
- 5/8 inch (15.9 mm) DEXcell Glass Mat Roof Board is UL Classified for use in numerous hourly rated UL assemblies, including UL "P" roof assemblies; refer to UL Certifications Directory: ul.com. Meets Type X per ASTM C1177.
- DEXcell Glass Mat Roof Board complies with requirements of FM 4450 and FM 4470. Meets FM Class 1.

Limitations

- DEXcell Glass Mat Roof Boards are engineered to perform within a properly designed roof system. The use of DEXcell Glass Mat Roof Boards as a roofing system component is the responsibility of the design professional.
- Design roof assemblies containing DEXcell Glass Mat Roof Boards to control vapor drive and moisture.
- Although DEXcell Glass Mat Roof Boards are engineered with coated fiberglass facers and high-density gypsum cores, the presence of free moisture can have an adverse effect on product performance and may compromise the installation of additional roofing system components.

- Moisture accumulation may also significantly decrease wind uplift and vertical pull resistance in the system or assembly. DEXcell® Glass Mat Roof Boards that contain disproportionate free moisture content may require testing or replacement.
- Do not use panels as a nailing base (they are nonstructural).
- For suitability in specific roofing systems, contact roofing manufacturers on the application of their products to DEXcell Glass Mat Roof Boards.
- Do not expose DEXcell Glass Mat Roof Boards to weather conditions, dew, installation techniques or moisture drive conditions that may have adverse effects on the performance of the roof system.
- Apply only as much DEXcell Glass Mat Roof Boards as can be covered by a watertight roof covering the same day.
- Do not apply DEXcell Glass Mat Roof Boards to wet roofing substrates.

HANDLING AND PROJECT CONDITIONS

- Avoid water exposure during shipping, handling, storage, installation and after installation of roof boards.
- Remove nonbreathable shipping wrap material upon receiving and storing roof boards.
- Store roof boards off the ground and under cover. Store boards flat. Use sufficient supports extending under the entire length of roof boards to prevent sagging.
- Keep roof boards dry to minimize the potential for mold growth. Take adequate care while transporting, storing, applying and maintaining roof boards.
- Do not apply roof boards with visible signs of moisture damage or mold growth. Do not apply roof boards over other building materials where conditions exist that are favorable to mold growth.

MAINTENANCE FOLLOWING APPLICATION

- Maintain essential elements of sound weather-tight building envelope, including roofing, joint sealants, penetrations and flashings.
- Take immediate and appropriate remediation measures as soon as water leaks or condensation sources are identified.
- Perform routine cleaning and maintenance operations using methods that prevent leaks and resulting moisture saturation of roof boards.

PACKAGING

Thickness	1/4"	1/2"	5/8"
4' x 4' DEXcell Glass Mat			
Pieces per pallet	60	48	44
Sq. ft. per pallet	960	768	704
Weight per pallet, lbs.	1,200	1,612	1,964
Sq. ft. per truck	38,400	23,040	16,900
Weight per truck, lbs.	48,000	48,384	47,139
4' x 8' DEXcell Glass Mat			
Pieces per pallet	44	30	30
Sq. ft. per pallet	1,408	960	960
Weight per pallet, lbs.	1,760	2,016	2,678
Sq. ft. per truck	38,020	23,040	17,280
Weight per truck, lbs.	47,520	48,384	48,211

Note: Any protective plastic factory packaging that is used to wrap DEXcell Roof Boards for shipment is intended to provide temporary protection from exposure to moisture only, and is not intended to provide protection during storage after delivery.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



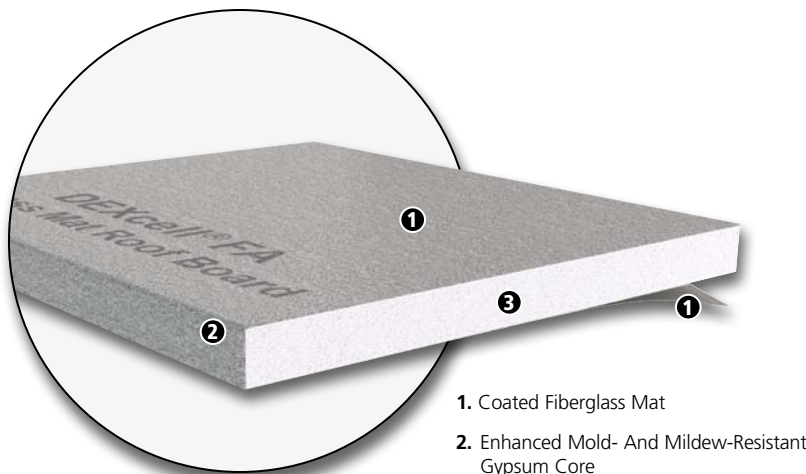
FA Glass Mat

Roof Board

DEXcell® BRAND FA Glass Mat Roof Board has heavy duty coated fiberglass facers and an enhanced mold-resistant gypsum core. This mold- and moisture-resistant gypsum panel is a substrate board, thermal barrier and/or coverboard for commercial roofing applications. It scores and cuts easily, and is specially coated on the front, back and sides for easy handling.

Use it for a wide variety of roofing systems, including fully adhered, modified bitumen, fluid applied, spray foam and metal roofs. It also serves as a fire barrier and thermal barrier.

Sizes: 1/4 in. (6.4 mm), 1/2 in. (12.7 mm) and 5/8 in. (15.9 mm) thick boards are available in 4 ft. (1,219 mm) widths, and in standard lengths of 4 ft. (1,219 mm) and 8 ft. (2,438 mm).



1. Coated Fiberglass Mat
2. Enhanced Mold- And Mildew-Resistant Gypsum Core
3. Square Edge

DEXcell[®]
BRAND
FA Glass Mat Roof Board

National 
Gypsum[®]

Basic Uses

APPLICATIONS

- Use DEXcell® FA Glass Mat Roof Board as a substrate board and for thermal protection in roofing assemblies. It provides increased fire safety and acoustical enhancement. It also serves as a substrate for a vapor retarder and/or continuous substrate for the application of roofing membranes. This board provides increased moisture and mold resistance.
- Use it as an insulation cover board in roofing assemblies. DEXcell FA Glass Mat Roof Board protects and supports the roof membrane; provides increased fire, moisture and mold resistance; and reduces the potential for penetration damage to the membrane.
- Use it to sheath the roof side of parapet and penthouse walls.

ADVANTAGES

- Scores and snaps easily.
- Fiberglass mat on face and back has special coating for easy handling.
- Meets ASTM C1177.
- Meets FM Class 1 and UL Class A fire ratings for roofing systems up to unlimited slope per UL 790.
- Approved component in specific UL fire-rated designs.
- Use it as part of a class A, B or C roof covering that has been tested in accordance with UL 1256 or FM 4450. No additional thermal barrier is required as per IBC 2603.
- Anti-microbial per ASTM D6329.
- Resists the growth of mold per ASTM D3273 with a score of 10, the best possible score.
- Eliminates the need for a field-applied primer for many fully adhered roofing membrane applications.
- High-density coverboard/thermal barrier.

Installation Recommendations

GENERAL

- Install roof boards in accordance with methods described in the standards and references cited in this document.
- Examine and inspect deck substrate to which roof boards are to be applied. Remedy all defects prior to installation of the roof boards.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Install fire-rated assemblies in accordance with the details found in the UL Fire Resistance Directory at: ul.com.
- See Physical Properties chart for maximum flute span when panels are applied directly over metal decking.

WIND UPLIFT

DEXcell FA Glass Mat Roof Boards are included in numerous assemblies evaluated by Factory Mutual Global (FMG) and other independent laboratories for wind-uplift performance. For information concerning such assemblies, visit: roofnav.com.

Refer to roof system manufacturer's written instructions, local code requirements, Factory Mutual Global (FMG), and Underwriters Laboratories (UL) requirements for proper installation techniques.

- Use fasteners or adhesives specified in accordance with system requirements. Install approved fasteners with plates into the DEXcell FA Glass Mat Roof Board, flush with the surface. Install fasteners and adhesives in compliance with the roof system manufacturer's installation recommendations and FMG Property Loss Prevention Data Sheet 1-29. Proper fastener spacing or adhesive application is essential to achieve wind-uplift performance.
- Locate board edge joints on, and end joints parallel to, metal deck ribs. Stagger end joints of adjacent lengths of DEXcell FA Glass Mat Roof Board. In typical installations, butt board edges and ends loosely.

TECHNICAL DATA

PHYSICAL PROPERTIES			
	1/4" DEXcell FA Glass Mat	1/2" DEXcell FA Glass Mat	5/8" DEXcell FA Glass Mat
Thickness¹, Nominal	1/4" (6.4 mm)	1/2" (12.7 mm)	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm)	4' (1,219 mm)	4' (1,219 mm)
Length¹, Standard	4' (1,219 mm), 8' (2,438 mm)	4' (1,219 mm), 8' (2,438 mm)	4' (1,219 mm), 8' (2,438 mm)
Weight, Nominal	1.2 lbs. / sq. ft. (5.9 k/m ²)	2.0 lbs. / sq. ft. (10 k/m ²)	2.5 lbs. / sq. ft. (12 k/m ²)
Edges¹	Square	Square	Square
Flexural Strength, Parallel¹	≥ 40 lbf. (178 N)	≥ 80 lbf. (356 N)	≥ 100 lbf. (445 N)
Humidified Deflection¹	N/A	≤ 2/8" (6.4 mm)	≤ 1/8" (3.2 mm)
Nail Pull Resistance¹	≥ 40 lbf. (178 N)	≥ 80 lbf. (356 N)	≥ 90 lbf. (400 N)
Hardness¹ – Core, Edges and Ends	≥ 15 lbf. (67 N)	≥ 15 lbf. (67 N)	≥ 15 lbf. (67 N)
Bending Radius	4' (1,219 mm)	6' (1,829 mm)	8' (2,438 mm)
Thermal Resistance⁴	R = .23	R = .43	R = .5
Permeance⁵	25 perms	24 perms	23 perms
Water Absorption⁴ (% of Weight)	≤ 10%	≤ 10%	≤ 10%
Surfacing	Coated Fiberglass	Coated Fiberglass	Coated Fiberglass
Flute Spanability⁶	2-5/8" (67 mm)	5" (127 mm)	8" (203 mm)
Compressive Strength⁷	900 psi	900 psi	900 psi
Mold Resistance⁸	Score of 10	Score of 10	Score of 10
Product Standard Compliance	ASTM C1177	ASTM C1177	ASTM C1177
Fire-Resistance Characteristics			
Core Type	Regular	Regular	Type X
UL Type Designation	DEXcell FA Glass Mat Roof Board	DEXcell FA Glass Mat Roof Board	DEXcell FA Glass Mat Roof Board
Combustibility²	Non-combustible Core	Non-combustible Core	Non-combustible Core
Surface Burning Characteristics³	Class A	Class A	Class A
Flame Spread³	0	0	0
Smoke Development³	0	0	0
Fire Classification	UL Classified, FM Approved	UL Classified, FM Approved	UL Classified, FM Approved
Applicable Standards and References			
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products			
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus			
ASTM C1177 Standard Test Method for Glass Mat Gypsum Substrate for Use as Sheathing			
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber			
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials			
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials			
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C			
ASTM E661 Standard Test Method for Performance of Wood and Wood-Based Floor and Roof Sheathing Under Concentrated Static and Impact Loads			
Gypsum Association, GA-238, <i>Guidelines for Prevention of Mold Growth on Gypsum Board</i>			
National Gypsum Company, <i>NGC Construction Guide</i>			

1. Specified values per ASTM C1177, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E136.

3. Tested in accordance with ASTM E84.

4. Tested in accordance with ASTM C518.

5. Tested in accordance with ASTM E96.

6. Tested in accordance with ASTM E661.

7. Tested in accordance with ASTM C473, annex X3.

8. Tested in accordance with ASTM D3273.

SAFETY

Installers should wear long pants and a long-sleeved, loose fitting shirt. Use protective gloves and special eye protection (goggles or safety glasses with side shield). Do not use a power saw to cut these products.

Caution: Because this product contains fiberglass, dust and glass fibers may be released during normal handling, which could result in eye or skin irritation or cause difficulty in breathing. Whenever possible, avoid contact with the skin and eyes and avoid breathing dust or fibers that may be released during installation. Consult the SDS for this product, available at: nationalgypsum.com before use.

Fire-Resistance Ratings

Fire and sound ratings for building systems utilizing glass mat gypsum roof boards are dependent on the thickness of the roof board, its application in conjunction with other roof assembly parts, and the manner in which the assembly is installed.

Tests for fire resistance and sound transmission performed by independent laboratories have resulted in specific ratings for roof assemblies. For maximum fire resistance and sound control, use double-layer construction. The additional mass further retards heat and noise penetration.

Fire-resistance ratings represent the results of tests on assemblies made up of specific materials in a specific configuration. When selecting construction designs to meet certain fire-resistance requirements, use caution to ensure that each component of the assembly is the one specified in the test. Further, take precaution that assembly procedures are in accordance with those of the tested assembly. For copies of specific tests, call 1-800-NATIONAL. For fire-safety information, see: nationalgypsum.com.

- DEXcell® FA Glass Mat Roof Board meets UL Class A fire ratings for roofing systems up to unlimited slope per UL 790; refer to UL Certifications Directory: ul.com.
- DEXcell FA Glass Mat Roof Board is classified in roof deck constructions in accordance with ANSI/ UL 1256; refer to UL Certifications Directory: ul.com.
- 5/8 inch (15.9 mm) DEXcell FA Glass Mat Roof Board is UL Classified for use in numerous hourly rated UL assemblies including UL "P" roof assemblies; refer to UL Certifications Directory: ul.com. Meets Type X per ASTM C1177.
- DEXcell FA Glass Mat Board complies with requirements of FM 4450 and FM 4470. Meets FM Class 1.

Limitations

- DEXcell FA Glass Mat Roof Boards are engineered to perform within a properly designed roof system. The use of DEXcell FA Glass Mat Roof Boards as a roofing system component is the responsibility of the design professional.
- Design roof assemblies containing DEXcell FA Glass Mat Roof Boards to control vapor drive and moisture.
- Although DEXcell FA Glass Mat Roof Boards are engineered with coated fiberglass facers and high-density gypsum cores, the presence of free moisture can have an adverse effect on product performance and may compromise the installation of additional roofing system components.

- Moisture accumulation may also significantly decrease wind uplift and vertical pull resistance in the system or assembly. DEXcell® FA Glass Mat Roof Boards that contain disproportionate free moisture content may require testing or replacement.
- Do not use panels as a nailing base (they are nonstructural).
- For suitability in specific roofing systems, contact roofing manufacturers on the application of their products to DEXcell FA Glass Mat Roof Boards.
- Do not expose DEXcell FA Glass Mat Roof Board to weather conditions, dew, application temperatures, installation techniques or moisture drive conditions that may have adverse effects on the performance of the roof system.
- Apply only as much DEXcell FA Glass Mat Roof Boards as can be covered by a watertight roof covering the same day.
- Do not apply DEXcell FA Glass Mat Roof Boards to wet roofing substrates.

HANDLING AND PROJECT CONDITIONS

- Avoid water exposure during shipping, handling, storage, installation and after installation of roof boards.
- Remove nonbreathable shipping wrap material upon receiving and storing roof boards.
- Store roof boards off the ground and under cover. Store boards flat. Use sufficient supports extending under the entire length of roof boards to prevent sagging.
- Keep roof boards dry to minimize the potential for mold growth. Take adequate care while transporting, storing, applying and maintaining roof boards.
- Do not apply roof boards with visible signs of moisture damage or mold growth. Do not apply roof boards over other building materials where conditions exist that are favorable to mold growth.

MAINTENANCE FOLLOWING APPLICATION

- Maintain essential elements of sound weather-tight building envelope, including roofing, joint sealants, penetrations and flashings.
- Take immediate and appropriate remediation measures as soon as water leaks or condensation sources are identified.
- Perform routine cleaning and maintenance operations using methods that prevent leaks and resulting moisture saturation of roof boards.

PACKAGING

Thickness	1/4"	1/2"	5/8"
4' x 4' DEXcell FA Glass Mat			
Pieces per pallet	60	48	44
Sq. ft. per pallet	960	768	704
Weight per pallet, lbs.	1,200	1,612	1,964
Sq. ft. per truck	38,400	23,040	16,900
Weight per truck, lbs.	48,000	48,384	47,139
4' x 8' DEXcell FA Glass Mat			
Pieces per pallet	44	30	30
Sq. ft. per pallet	1,408	960	960
Weight per pallet, lbs.	1,760	2,016	2,678
Sq. ft. per truck	38,020	23,040	17,280
Weight per truck, lbs.	47,520	48,384	48,211

Note: Any protective plastic factory packaging that is used to wrap DEXcell Roof Boards for shipment is intended to provide temporary protection from exposure to moisture only, and is not intended to provide protection during storage after delivery.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.

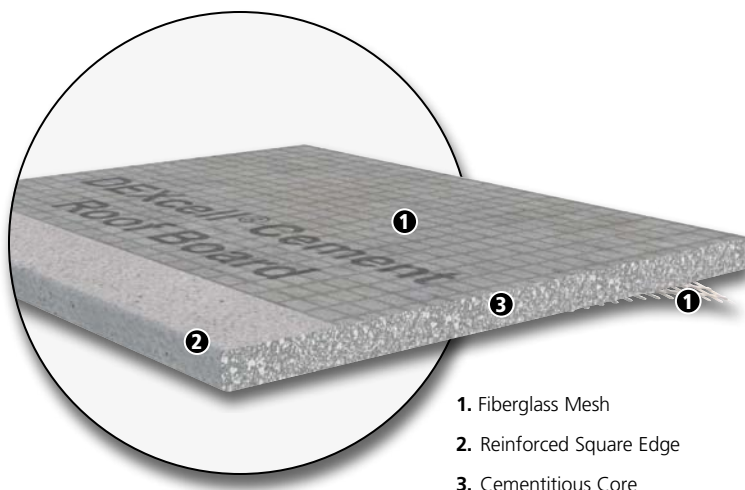


Cement Roof Board

DEXcell® BRAND Cement Roof Board provides an exceptionally hard, durable surface that withstands prolonged exposure to moisture. Its composition of Portland cement and lightweight aggregate with heavy duty fiberglass-mesh facers makes it an excellent fire and thermal barrier. This mold- and moisture-resistant cement panel is a substrate board, thermal barrier and coverboard for commercial roofing applications.

Use it for a wide variety of roofing systems, including fully adhered, mechanically attached and ballasted roofs using single-ply membranes, modified bitumen, fluid-applied, built-up roofing, spray foam and metal.

Sizes: 7/16 in. (11.1 mm) thick boards are available in 4 ft. (1,219 mm) widths and in standard lengths of 4 ft. (1,219 mm) and 8 ft. (2,438 mm).



DEXcell[®]
BRAND
Roof Board

National 
Gypsum[®]

Basic Uses

APPLICATIONS

- Use DEXcell® Cement Roof Board as a substrate board and for thermal protection in roofing assemblies. It provides increased fire safety and acoustical enhancement. It also serves as a substrate for a vapor retarder and/or continuous substrate for the application of roofing membranes. This board provides increased moisture and mold resistance.
- Use it as a cover board in roofing assemblies. DEXcell Cement Roof Board protects and supports the roof membrane; provides increased fire, moisture and mold resistance; and reduces the potential for penetration damage to the membrane.
- Use it to sheath the roof side of parapet and penthouse walls.
- Ideal for green roofs and photovoltaic systems.

ADVANTAGES

- Excellent bond/pull-through/uplift values.
- Impact resistant, extremely durable and dimensionally stable.
- High compressive strength.
- Lightweight, cementitious core.
- Superior moisture resistance.

- Exceptional freeze/thaw resistance.
- Scores and snaps easily.
- Meets ASTM C1325.
- Meets FM Class 1 and UL Class A fire ratings for roofing systems up to unlimited slope.
- Use in accordance with a rated system, and DEXcell Cement Roof Board provides a thermal barrier meeting IBC Section 2603.
- Resists the growth of mold per ASTM D3273 with a score of 10, the best possible score.

Installation Recommendations

GENERAL

- Install roof boards in accordance with methods described in the standards and references cited in this document. Always refer to the roof-system manufacturer for project-specific installation details.
- Examine and inspect deck substrate to which roof boards are to be applied. Remedy all defects prior to installation of the roof boards.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Install fire-rated assemblies in accordance with the details found in the UL Fire Resistance Directory: ul.com.
- See Physical Properties chart for maximum flute span when panels are applied directly over metal decking.

TECHNICAL DATA

PHYSICAL PROPERTIES	
7/16" DEXcell Cement Roof Board	
Thickness¹, Nominal	7/16" (11.1 mm)
Width¹, Nominal	4' (1,219 mm)
Length¹, Standard	4' (1,219 mm), 8' (2,438 mm)
Weight, Nominal	2.1 lbs. / sq. ft. (10.3 k/m ²)
Edges¹	Square
Flexural Strength⁶	≥ 750 psi
Bending Radius	5' (1,524 mm)
Thermal Resistance³	R = .28
Permeance⁴	> 5 perms
Water Absorption¹⁰ (% of Weight)	< 10%
Linear Variation with Change Moisture⁷	≤ 0.07%
Flute Spanability⁵	12" (305 mm)
Compressive Strength¹¹	1,250 psi
Mold Resistance⁸ (ASTM D3273)	Score of 10
Mold Resistance⁹ (ASTM G21)	Score of 0
Product Standard Compliance	ASTM C1325
Fire-Resistance Characteristics	
Core Type	N/A
UL Type Designation	DEXcell Cement Roof Board
Surface Burning Characteristics³	Class A
Flame Spread²	0
Smoke Development²	0
Fire Classification	UL Classified, FM Approved
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C947 Standard Test Method for Flexural Properties of Thin-Section Glass-Fiber-Reinforced Concrete (Using Simple Beam with Third-Point Loading)	
ASTM C1325 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing	
ASTM D1037 Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials	
ASTM D2394 Standard Test Methods for Simulated Service Testing of Wood and Wood-Base Finish Flooring	
ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials	
ASTM E661 Standard Test Method for Performance of Wood and Wood-Based Floor and Roof Sheathing Under Concentrated Static and Impact Loads	
ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi	
National Gypsum Company, <i>NGC Construction Guide</i>	

1. Specified minimum values per ASTM C1325, tested in accordance with ASTM C473.

2. Tested in accordance with ASTM E84.

3. Tested in accordance with ASTM C518.

4. Tested in accordance with ASTM E96.

5. Tested in accordance with ASTM E661.

6. Specified minimum values per ASTM C1325, tested in accordance with ASTM C947.

7. Specified minimum values per ASTM C1325, tested in accordance with ASTM D1037.

8. Tested in accordance with ASTM D3273.

9. Tested in accordance with ASTM G21.

10. Tested in accordance with ASTM C473.

WIND UPLIFT

DEXcell® Cement Roof Boards are included in numerous assemblies evaluated by Factory Mutual Global (FMG) and other independent laboratories for wind-uplift performance. For information concerning such assemblies, visit: roofnav.com.

Refer to roof system manufacturer's written instructions, local code requirements, Factory Mutual Global (FMG) and Underwriters Laboratories (UL) requirements for proper installation techniques.

- Use fasteners or adhesives specified in accordance with system requirements. Install approved fasteners with plates into the DEXcell Cement Roof Board. Install fasteners and adhesives in compliance with the roof-system manufacturer's installation recommendations and FMG *Property Loss Prevention Data Sheet 1-29*. Proper fastener spacing or adhesive application is essential to achieve wind-uplift performance.
- Locate board edge joints on, and end joints parallel to, metal deck ribs. Stagger end joints of adjacent lengths of DEXcell Cement Roof Board. In typical installations, butt board edges and ends loosely.

SAFETY

Installers should wear eye protection (goggles or safety glasses with side shield). Do not use a power saw to cut these products. Whenever possible, avoid contact with the skin and eyes and avoid breathing dust that may be released during cutting. Consult the SDS for this product, available at nationalgypsum.com before use.

Fire-Resistance Ratings

Fire and sound ratings for building systems utilizing cement roof boards are dependent on the thickness of the roof board, its application in conjunction with other roof assembly parts, and the manner in which the assembly is installed.

Tests for fire resistance and sound transmission performed by independent laboratories have resulted in specific ratings for roof assemblies. For maximum fire resistance and sound control, use double-layer construction. The additional mass further retards heat and noise penetration.

Fire-resistance ratings represent the results of tests on assemblies made up of specific materials in a specific configuration. When selecting construction designs to meet certain fire-resistance requirements, use caution to ensure that each component of the assembly is the one specified in the test. Further, take precaution that assembly procedures are in accordance with those of the tested assembly. For copies of specific tests, call 1-800-NATIONAL. For fire-safety information, see: nationalgypsum.com.

- DEXcell Cement Roof Board meets UL Class A fire ratings for roofing systems up to unlimited slope per UL 790; refer to UL Certifications Directory: ul.com.
- DEXcell Cement Roof Board is classified in roof deck constructions in accordance with ANSI/ UL 1256; refer to UL Certifications Directory: ul.com.
- DEXcell Cement Roof Board complies with requirements of FM 4450 and FM 4470. Meets FM Class 1.

Limitations

- DEXcell® Cement Roof Boards are engineered to perform within a properly designed roof system. The use of DEXcell Cement Roof Boards as a roofing system component is the responsibility of the design professional.
- Design roof assemblies containing DEXcell Cement Roof Boards to control vapor drive and moisture.
- Moisture accumulation may also significantly decrease wind uplift and vertical pull resistance in the system or assembly. DEXcell Cement Roof Boards that contain disproportionate free moisture content may require testing or replacement. The presence of free moisture can have an adverse effect on product performance and may compromise the installation of additional roofing system components.
- Do not use panels as a nailing base (they are nonstructural).
- For suitability in specific roofing systems, contact roofing manufacturers on the application of their products to DEXcell Cement Roof Boards.
- Do not expose DEXcell Cement Roof Board to extreme weather conditions and temperatures, dew, installation techniques or moisture drive conditions that may have adverse effects on the performance of the roof system.
- Apply only as much DEXcell Cement Roof Board as can be covered by a watertight roof covering the same day.
- Do not apply DEXcell Cement Roof Board to wet roofing substrates.

HANDLING AND PROJECT CONDITIONS

- Avoid water exposure during shipping, handling, storage, installation and after installation of roof boards in order to avoid the formation of mold or mildew.
- Remove nonbreathable shipping wrap material upon receiving and storing roof boards.
- Store roof boards off the ground and under cover. Store boards flat. Use sufficient supports extending under the entire length of roof boards to prevent sagging.
- Keep roof boards dry to minimize the potential for mold growth. Take adequate care while transporting, storing, applying and maintaining roof boards.

- Do not apply roof boards with visible signs of moisture damage or mold growth. Do not apply roof boards over other building materials where conditions exist that are favorable to mold growth.

MAINTENANCE FOLLOWING APPLICATION

- Maintain essential elements of sound weather-tight building envelope, including roofing, joint sealants, penetrations, and flashings.
- Take immediate and appropriate remediation measures as soon as water leaks or condensation sources are identified.
- Perform routine cleaning and maintenance operations using methods that prevent leaks and resulting moisture saturation of roof boards.

PACKAGING

Thickness	7/16"
4' x 4' DEXcell Cement	
Pieces per pallet	30
Sq. ft. per pallet	480
Weight per pallet, lbs.	1,067
Sq. ft. per truck	22,080
Weight per truck, lbs.	49,083
4' x 8' DEXcell Cement	
Pieces per pallet	30
Sq. ft. per pallet	960
Weight per pallet, lbs.	2,110
Sq. ft. per truck	22,080
Weight per truck, lbs.	48,531

Note: Any protective plastic factory packaging that is used to wrap DEXcell Roof Boards for shipment is intended to provide temporary protection from exposure to moisture only, and is not intended to provide protection during storage after delivery.

For More Information

ARCHITECTURAL SPECIFICATIONS

National Gypsum Company's CSI MasterFormat® 3-part guide specifications are downloadable as editable Microsoft® Word documents at: nationalgypsum.com.

LATEST INFORMATION AND UPDATES

For the latest technical information and updates, call NGC Construction Services: **1-800-NATIONAL (628-4662)** or visit our website: nationalgypsum.com.



Design Recommendations

DEXcell® Roof Boards form one component among many components in a properly designed roof assembly. National Gypsum does not warrant the design, quality or workmanship of any other components in any roof assembly in which the DEXcell® products may be used or of the roof assembly as a whole. Specifically, National Gypsum offers no recommendations regarding the following aspects of a roof assembly:

- The type of roof assembly to use (single ply, modified bitumen, built-up roof, etc.);
- The specifications of the other components in the roof assembly;
- Whether to use a separator sheet or vapor barrier between DEXcell Roof Boards and any other component of the roof assembly;
- Priming requirements.

However, different DEXcell products are designed for different applications. Refer to the chart below for National Gypsum's recommendations of which DEXcell products are best suited for various applications.

BEST CHOICE FOR ALL APPLICATIONS			
Roof System Applications	DEXcell FA – Glass Mat Roof Boards	DEXcell Glass Mat Roof Boards	DEXcell Cement Roof Boards
Single Ply - Fully Adhered	Recommended	Not Recommended	Recommended
Single Ply - Mechanically Attached	Acceptable*	Recommended	Recommended
Single Ply - Self Adhered	Recommended	Not Recommended	Recommended
Modified Bitumen - Hot Mop	Not Recommended	Not Recommended	Recommended
Modified Bitumen - Cold Adhesive	Recommended	Not Recommended	Recommended
Modified Bitumen - Torch	Recommended	Not Recommended	Recommended
Modified Bitumen - Self Adhered	Recommended	Not Recommended	Recommended
Built-Up Roof (BUR)	Not Recommended	Not Recommended	Recommended
Spray Polyurethane Foam	Recommended	Not Recommended	Recommended
Fluid Applied	Recommended	Not Recommended	Recommended
Thermal Barrier	Acceptable*	Recommended	Recommended
Fire Barrier	Acceptable*	Recommended	Recommended
Substrate for Vapor Barrier	Recommended	Acceptable*	Recommended
Substrate for Parapet Wall	Recommended	Not Recommended	Recommended
Vegetative "Green" Roof System	Acceptable*	Not Recommended	Recommended
Photovoltaic Roofing System	Acceptable*	Not Recommended	Recommended
Standing Seam Metal Roof System	Acceptable*	Recommended	Acceptable*
Wood Shake Underlayment	Acceptable*	Recommended	Acceptable*

*Indicates product applications that may be used successfully, but may not be optimal in terms of cost or performance as compared to the recommended product.

Note: In situations where prolonged excessive membrane surface temperatures may be experienced, such as dark-colored membranes in Southern climates, roof surfaces that experience reflected sunlight or photovoltaic installations, DEXcell Cement Roof Board is the preferred DEXcell product.

Application Limitations

The performance of any DEXcell product may be negatively impacted by excess moisture, heat or pressure. The recommendations and limitations below are intended to lower the risk of excess moisture, heat and loads. Failure to observe these recommendations and limitations may void the warranty.

ADHESIVES AND PRIMERS

DEXcell® FA Glass Mat Roof Board and DEXcell® Cement Roof Board are the preferred products for use in fully adhered roof systems, subject to the following limitations:

Solvent-Based Adhesives and Primers. Use solvent-based adhesives and primers in accordance with the manufacturer's procedures. Installers must allow sufficient time for solvents and primers to evaporate after application to avoid potential damage to the DEXcell products or other components. Excessive use of solvent-based adhesives increases the risk of blisters. For water-based adhesives, follow manufacturer's recommendations. Confirm any priming requirements of DEXcell products with the membrane manufacturer.

Cold Adhesives. Apply cold adhesives uniformly, as necessary, for good bond. Excessive use of cold adhesives increases the risk of blisters.

Torch Down Roofing. When applying a membrane using a “torch down” application method, all products must be dry prior to beginning the installation. Use proper torch technique and limit the amount of heat placed on the DEXcell® Roof Boards by aiming the torch flame directly at the roof membrane roll and not at the DEXcell Roof Boards. Avoid overheating the membrane or DEXcell® product surface. Check with the roof system manufacturer or roof design professional for attachment requirements for each project.

Hot Mop Applications. DEXcell Cement Roof Board is recommended for hot mop applications. When hot mopping, follow the manufacturer’s recommendations with respect to ambient temperature and humidity, optimal temperature for the asphalt, and appropriate handling of the material. For application temperatures in excess of 450°F (232°C) and/or mopping type IV asphalt, ribbon mopping, spot mopping or installing a venting base sheet is recommended.

Flood Mopping. Flood mopping DEXcell® FA Glass Mat Roof Boards or DEXcell® Glass Mat Roof Boards to a substrate and then flood mopping a membrane to the DEXcell product is not recommended. To avoid excess heat and moisture, spot mopping, ribbon mopping, or installing a venting base sheet is recommended.

Always allow time to cool between applications of hot asphalt or torching.

Additional Limitations

Avoid Excess Loads. Subjecting any DEXcell product to excessive loads or foot traffic may void the warranty. Take appropriate protective measures to avoid any concentration of weight that may damage or fracture the roof boards. For example, use extra caution when placing steel-wheeled equipment on installed DEXcell Roof Boards or when installing DEXcell Roof Boards on plaza decks.

Avoid Excess Moisture. Keep DEXcell products dry at all times. The presence of moisture on the surface or within the core of any substrate (including DEXcell products) or anywhere in the roof assembly can negatively impact performance by causing blisters to form during torching or hot mopping or by weakening the structural stability of the roof system. This can significantly decrease wind-uplift resistance in the roof system. It is recommended to evaluate the moisture content of DEXcell Roof Boards with a high-quality moisture meter.

Do not apply fully adhered membranes (solvent-based, water-based, cold adhesives, peel and stick, torched, hot mopped) to wet or dampened DEXcell products. All components of a roof assembly must be thoroughly dry prior to installation of the roof membrane. Do not install DEXcell products during rain, heavy fog, or any other conditions that could deposit moisture on the surface of the roof boards.

To reduce the impact of environmental moisture, DEXcell Roof Boards must be covered by the roof system membrane the same day they are installed. Install only as many DEXcell Roof Boards as can be covered by the final roof covering in the same day.

Take appropriate moisture-control measures when installing DEXcell products on new poured concrete or lightweight concrete roof deck, or when re-roofing over an existing concrete roof deck, in accordance with recommendations by roof design professionals, roof system manufacturers, and any applicable design or construction code requirements. Thoroughly dry re-roof or re-cover applications prior to installation of DEXcell products.

Installation Recommendations

National Gypsum Company makes no representations or warranties regarding best practices in the design or installation of roof assemblies. Refer to the applicable roof system manufacturer's written instructions, industry best practices, local code requirements and FM Global® (FM) and/or UL® requirements for proper installation techniques. In addition to the limitations regarding heat, moisture and loads in the sections above, DEXcell® products are subject to the following installation recommendations and limitations:

- Use only mechanical fasteners approved by FM or UL with DEXcell products and install such fasteners in strict compliance with the roof system manufacturer's installation recommendations and the most current applicable FM Loss Prevention Data Sheets. Proper fastener spacing is essential to achieve the proper wind-uplift performance.
- Install only as many DEXcell® Roof Boards as can be covered by the roof membrane system during the same day. Locate joints parallel to the deck ribs on the ribs of the steel roof deck. See the product data table for maximum flute span when installing panels directly over steel roof decking. Stagger end joints of adjacent lengths of DEXcell Roof Board. In typical installations, butt board edges and ends loosely. The design authority should calculate the appropriate spacing between roof boards to allow for thermal expansion based on typical post-installation roof temperature and accounting for installation conditions, in each case based on published DEXcell product properties data.
- For vertical parapet applications, use only 1/2 in. (12.7 mm) or 5/8 in. (15.9 mm) DEXcell® FA Glass Mat Roof Boards or DEXcell® Cement Roof Boards. Maximum framing spacing is 24 in. (610 mm) o.c. for 5/8 in. (15.9 mm) DEXcell® FA Glass Mat Roof Boards and 16 in. (406 mm) o.c. for both the 1/2 in. (12.7 mm) DEXcell FA Glass Mat Roof Board and 7/16 in. (11.1 mm) DEXcell Cement Roof Board.

Storage Recommendations

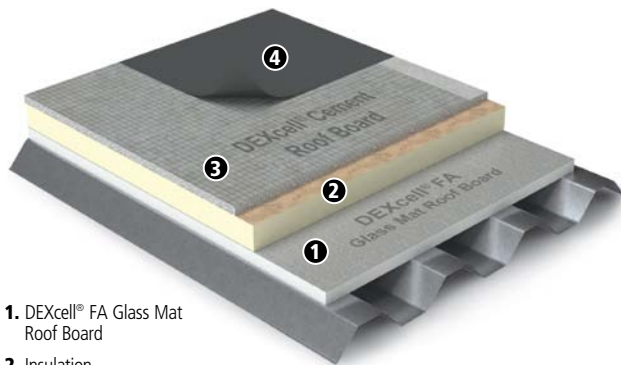
Keep DEXcell products dry at all times before, during and after the installation of the roof system. Upon receipt by the customer, remove all plastic packaging from the DEXcell Roof Boards immediately. Fully cover the DEXcell Roof Boards with a breathable, waterproof covering. Failure to immediately remove the plastic packaging may result in condensation or moisture being trapped on or in the product and may void the warranty.

Never store DEXcell Roof Board on the ground and always stack flat. Air must be allowed to circulate around and under the stored bundles of DEXcell Roof Board to avoid build-up of moisture.

Typical Roof System Applications

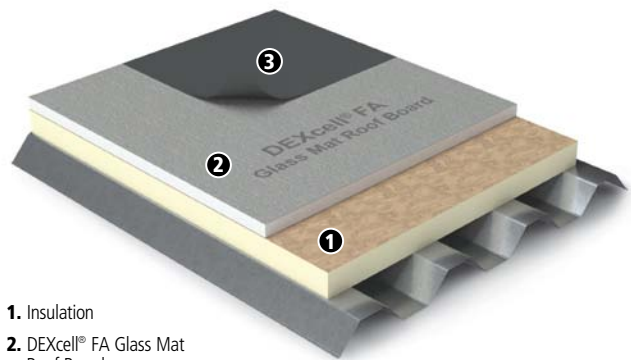
The following are examples of typical roof system applications using DEXcell® Roof Boards and should be considered to be for illustration purposes only. Consult with the roof system manufacturer or roof design professional for recommendations of use and installation. National Gypsum Company does NOT provide roof design services, and makes no warranties or representation with respect to any particular roof system or any components or materials, other than DEXcell Roof Boards. It is the responsibility of the roof system manufacturer or roof design professional to determine the suitability of DEXcell Roof Boards, or the use of any other materials with DEXcell Roof Boards, for any particular application.

COVERBOARD



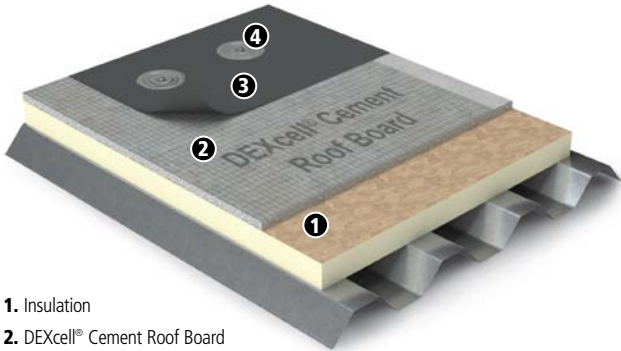
1. DEXcell® FA Glass Mat Roof Board
2. Insulation
3. DEXcell® Cement Roof Board
4. Membrane

COVERBOARD



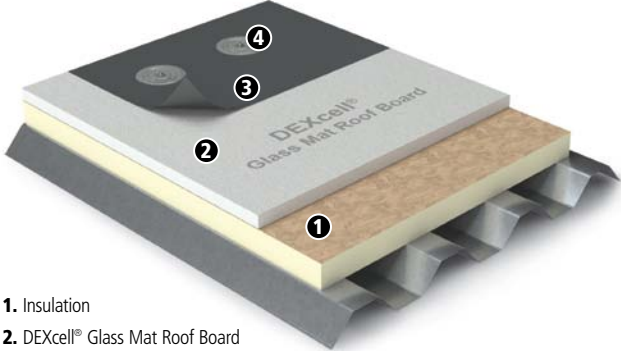
1. Insulation
2. DEXcell® FA Glass Mat Roof Board
3. Membrane

COVERBOARD



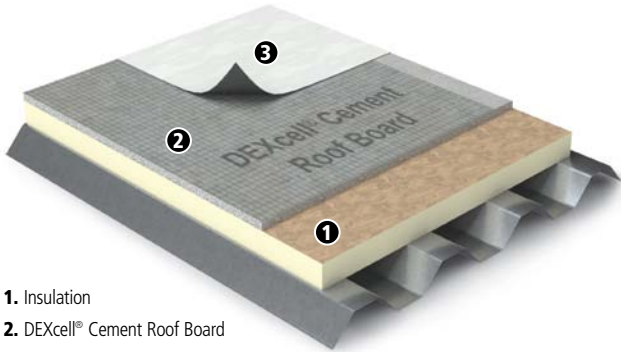
- 1. Insulation
- 2. DEXcell® Cement Roof Board
- 3. Membrane
- 4. Fastener

COVERBOARD



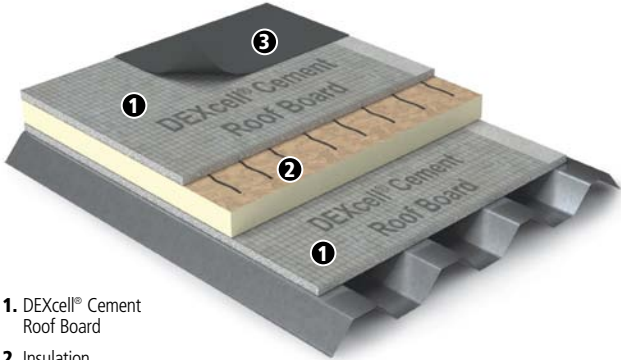
- 1. Insulation
- 2. DEXcell® Glass Mat Roof Board
- 3. Membrane
- 4. Fastener

COVERBOARD



- 1. Insulation
- 2. DEXcell® Cement Roof Board
- 3. Membrane

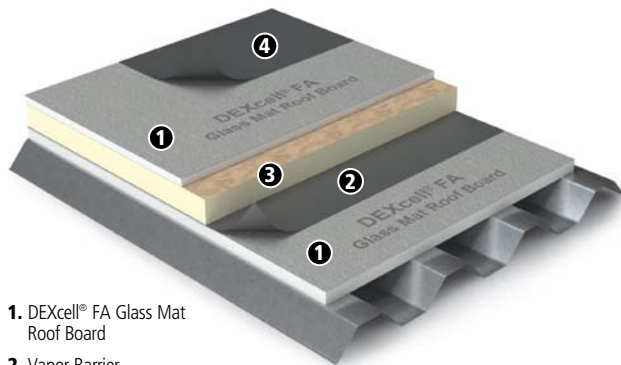
THERMAL BARRIER / VAPOR BARRIER



- 1. DEXcell® Cement Roof Board
- 2. Insulation
- 3. Membrane

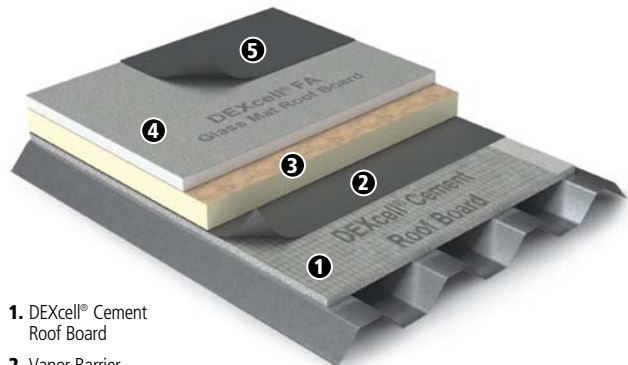
Typical Roof System Applications

THERMAL BARRIER / VAPOR BARRIER



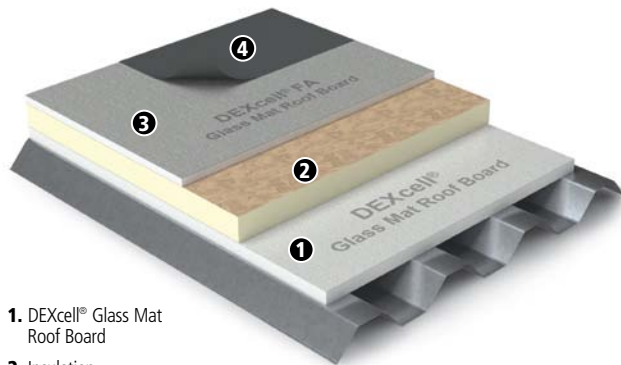
- 1. DEXcell® FA Glass Mat Roof Board
- 2. Vapor Barrier
- 3. Insulation
- 4. Membrane

THERMAL BARRIER / VAPOR BARRIER



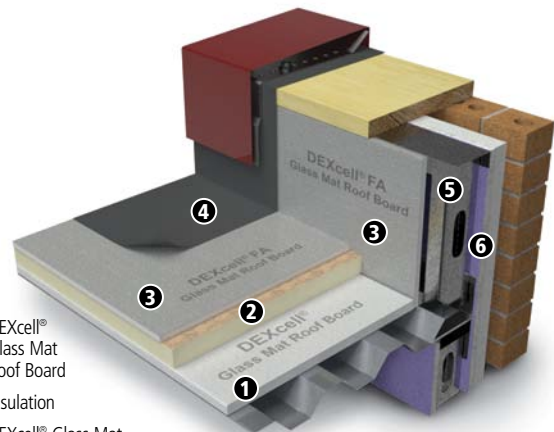
- 1. DEXcell® Cement Roof Board
- 2. Vapor Barrier
- 3. Insulation
- 4. DEXcell® FA Glass Mat Roof Board
- 5. Membrane

THERMAL BARRIER / VAPOR BARRIER



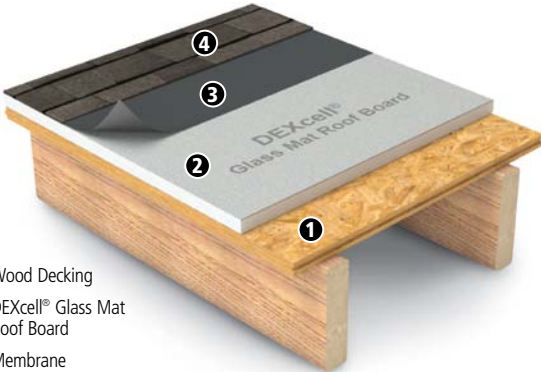
- 1. DEXcell® Glass Mat Roof Board
- 2. Insulation
- 3. DEXcell® FA Glass Mat Roof Board
- 4. Membrane

THERMAL BARRIER / VAPOR BARRIER



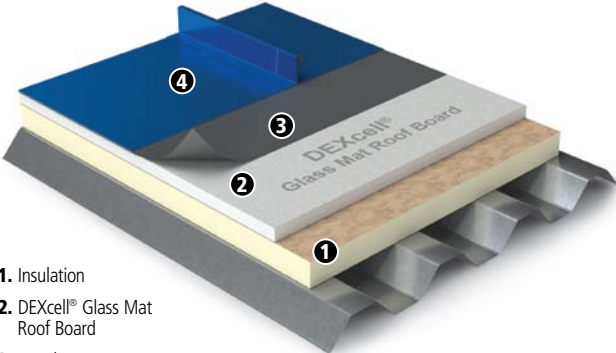
- 1. DEXcell® Glass Mat Roof Board
- 2. Insulation
- 3. DEXcell® Glass Mat Roof Board
- 4. Membrane
- 5. Parapet Wall Framing
- 6. EXP® Sheathing

VARIOUS APPLICATIONS



- 1. Wood Decking
- 2. DEXcell® Glass Mat Roof Board
- 3. Membrane
- 4. Shingles

VARIOUS APPLICATIONS



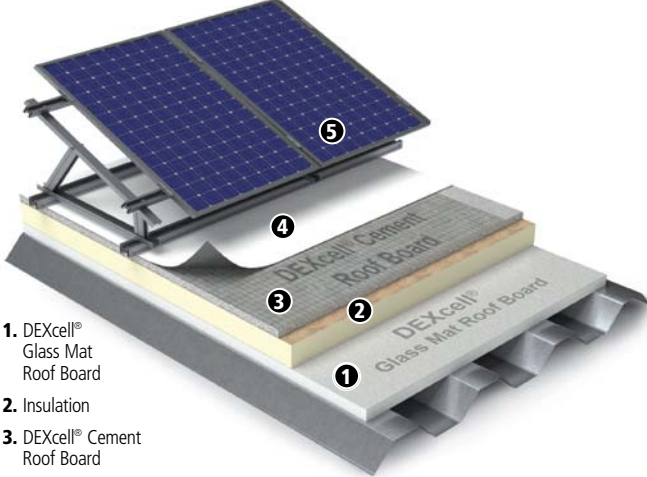
- 1. Insulation
- 2. DEXcell® Glass Mat Roof Board
- 3. Membrane
- 4. Metal Roof

VARIOUS APPLICATIONS



- 1. Insulation
- 2. DEXcell® Cement Roof Board
- 3. Membrane
- 4. Vegetative Roof System

VARIOUS APPLICATIONS



- 1. DEXcell® Glass Mat Roof Board
- 2. Insulation
- 3. DEXcell® Cement Roof Board
- 4. Membrane
- 5. Photovoltaic Panels

LIMITED WARRANTY AND REMEDIES**(United States, U.S. Territories, and Canada Only)**

National Gypsum Company ("NGC") warrants to each purchaser of its DEXcell® BRAND Roofing Products ("DEXcell"), and to the owner at the time of installation of any building upon which DEXcell is installed, that subject to the conditions and limitations set forth below: (1) DEXcell Roof Boards shall be free from defects in material and workmanship at the time of shipment ("Defects Warranty"); and (2) with respect to only DEXcell FA – Glass Mat Roof Boards (1/2" and 5/8" thicknesses only) and DEXcell – Cement Roof Boards, such products will not deteriorate as a result of exposure to normal weather conditions when properly installed on parapet walls ("Exposure Warranty"). Claims under the Defects Warranty may be made for up to two (2) years after the date of the product's manufacture, as printed on each DEXcell Roof Board. Claims under the Exposure Warranty may be made for up to ninety (90) days after the date of installation of the product.

This Limited Warranty is the only warranty applicable to DEXcell and IS IN LIEU OF, EXCLUDES, AND NGC DISCLAIMS, ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. NGC WILL NOT BE RESPONSIBLE OR LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY OR PUNITIVE DAMAGES, REGARDLESS OF THE NATURE OR THEORY OF THE CLAIM, OR FOR LOSS OF INCOME OR PROFITS, DAMAGE TO ANY STRUCTURE, CONTENTS OR OTHER PROPERTY, OR LOSS OF USE. Some states or provinces prohibit the exclusion or limitation of warranties or may not allow the exclusion or limitation of incidental or consequential damages. In this case, the above disclaimers may not apply to you. This warranty gives you specific legal rights and you may also have other rights which will vary depending upon the state or province.

WARRANTY CONDITIONS: This Limited Warranty applies only if the following conditions are met:

- DEXcell brand Roofing Products shall be dry prior to, during, and after roofing application processes.
- Installation methods are in strict accordance with roofing industry and roof system standards, proper roof design; applicable building codes, and any applicable written recommendations and specifications published by NGC.
- The DEXcell product has been properly handled and stored at all times in accordance with industry, trade, and standard building practices, and has not been abused or used for an improper application.
- Only as much DEXcell as can be covered by complete and final roofing system during the same day has been installed, without leaving the DEXcell product exposed and uncovered.
- The problem with the DEXcell product is not due to structural movement of the building; movement in, failure of or defects in materials to which the product is attached or which are attached to it; causes other than normal weather conditions, such as near gale or higher force winds, tornadoes, hail storms, hurricanes, floods, earthquakes or falling objects; immersion in water, or sustained pooling or cascading of water; or fire, vandalism, misuse or abuse.
- The building on which the product is installed is maintained with reasonable care.
- The problem or claim is not the result of mold, mildew, algae, fungus, or other conditions involving organic growth or bacteria or insect issues.

CLAIMS: All claims under this warranty must be submitted to NGC within thirty (30) days from the time you discover a problem with DEXcell products. Include a brief description of the problem with photographs and copies of sales receipts, invoices or other documents which may show the dates of purchase and installation. Mail this information to:

National Gypsum Company
5901 Carnegie Boulevard
Charlotte, NC 28209
Attn: Director, Quality Services R&D

NGC shall within a reasonable time be permitted to inspect the DEXcell products, site, installation and system conditions. The building owner must grant reasonable access for such inspection and shall not make or allow to be made any alteration or repair to DEXcell before NGC's inspection. If NGC's inspection confirms that the DEXcell product does not conform with the warranty set forth herein, then if all conditions are met NGC will, at its sole option, either replace the non-conforming DEXcell or refund the original uninstalled purchase price for the non-conforming DEXcell or, where the product has already been installed, provide reimbursement for the reasonable cost of repair or replacement of the non-conforming DEXcell Roof Board Product, up to a maximum amount equal to two (2) times the original uninstalled purchase price of the non-conforming DEXcell product. These remedies are NGC's sole and exclusive obligation and liability for any breach of warranty relating to DEXcell.

Issued July 2014



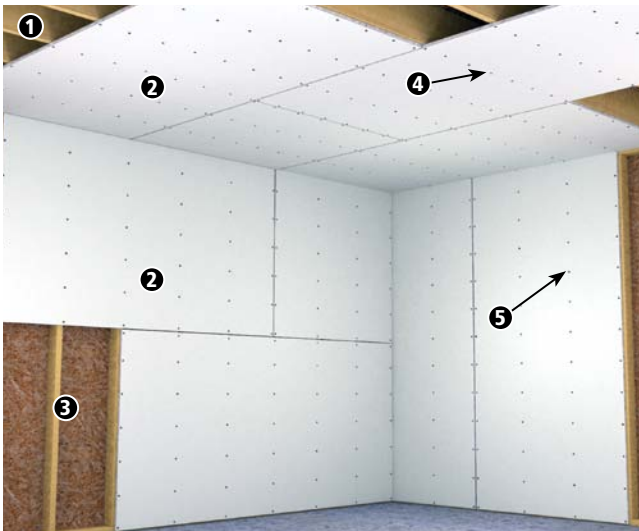
Wood Frame Walls And Ceilings

Single- And Double-Layer Construction

Single-Layer Construction

The single-layer construction system consists of a single layer of Gold Bond® BRAND Gypsum Board applied to wood framing. A variety of specialty products may be used to provide mold resistance, abuse resistance or sound damping.

STANDARD APPLICATION WITH NAILS



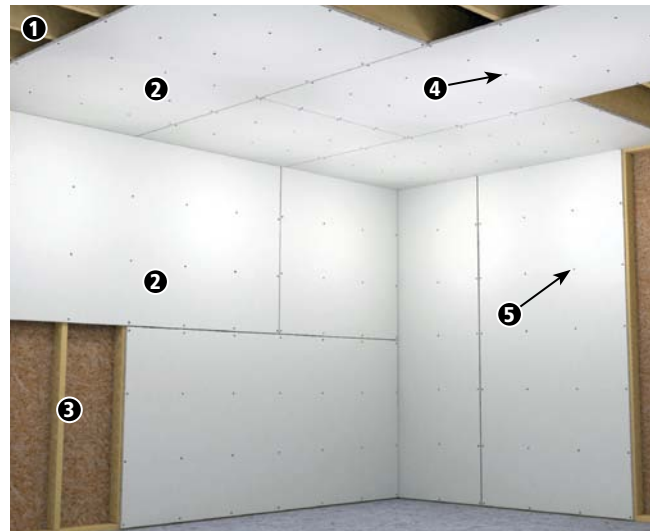
Installation Notes

1/2 in. (12.7 mm) Gypsum Board

- 24 in. (610 mm) o.c. maximum framing spacing
 - Ceiling application (perpendicular)
 - Wall application (perpendicular or parallel)
- 16 in. (406 mm) o.c. framing spacing
 - Ceiling application (perpendicular or parallel)
 - Wall application (perpendicular or parallel)
- Minimum gypsum board nail length 1-3/8 in. (34.9 mm)

1. Ceiling Joist Framing
2. Gypsum Board
3. Wall Framing
4. Ceiling: 7 in. (178 mm) o.c.
5. Wall: 8 in. (203 mm) o.c.

STANDARD APPLICATION WITH SCREWS



Installation Notes

1/2 in. (12.7 mm) Gypsum Board

- 24 in. (610 mm) o.c. maximum framing spacing
 - Ceiling application (perpendicular)
 - Wall application (perpendicular or parallel)
 - Screw spacing not to exceed 12 in. (305 mm) o.c.
- 16 in. (406 mm) o.c. framing spacing
 - Ceiling application (perpendicular or parallel)
 - Wall application (perpendicular or parallel)
- Minimum gypsum board screw length 1-1/8 in. (28.6 mm)

1. Ceiling Joist Framing
2. Gypsum Board
3. Wall Framing
4. Ceiling: 12 in. (305 mm) o.c.
5. Wall: 16 in. (406 mm) o.c.



Wood Frame Walls And Ceilings

NAIL APPLICATION

Apply Gold Bond® BRAND Gypsum Board to wood framing members. Apply board at right angles to ceiling framing first, and then apply vertically or horizontally to walls. To minimize joints and strengthen the wall, use the longest possible lengths. Cut boards accurately and abut joints, but do not force together.

Space nails no more than 7 in. (178 mm) o.c. on ceilings and 8 in. (203 mm) o.c. on walls. Locate fasteners not less than 3/8 in. (9.5 mm) from the edges and ends of the gypsum board. Fasten 3/8 in. (9.5 mm) gypsum board with minimum 1-1/4 in. (31.8 mm) nails, 1/2 in. (12.7 mm) gypsum board with minimum 1-3/8 in. (34.9 mm) nails and 5/8 in. gypsum board with minimum 1-1/2 in. (38.1 mm) nails.

DOUBLE NAILING

Use the double nailing method of attachment to minimize nail pops. Double nailing requires a second set of field nails, but the total quantity of nails does not double since the maximum nail spacing increases to 12 in. (305 mm) o.c. and conventional nailing is used on the perimeter. Begin by single nailing the field of the board starting at the center and working toward the ends and edges. Next, drive another nail 2 in. (50.8 mm) to 2-1/2 in. (63.6 mm) from the first set of field nails. After adding the second set of nails, strike the first set again to ensure the board is drawn tightly to the framing member.

SCREW APPLICATION

Apply Gold Bond® BRAND Gypsum Board to wood framing members using 1-1/4 in. (31.8 mm) Type W screws with a screw gun equipped with adjustable screw depth control and a #2 Phillips bit. Space screws 12 in. (305 mm) o.c. on ceilings and 16 in. (406 mm) o.c. on walls where the framing members are 16 in. (406 mm) o.c. Space screws 12 in. (305 mm) o.c. on ceilings and walls where the framing members are 24 in. (610 mm) o.c. Minimum screw penetration is 5/8 in. (15.9 mm) for wood studs.

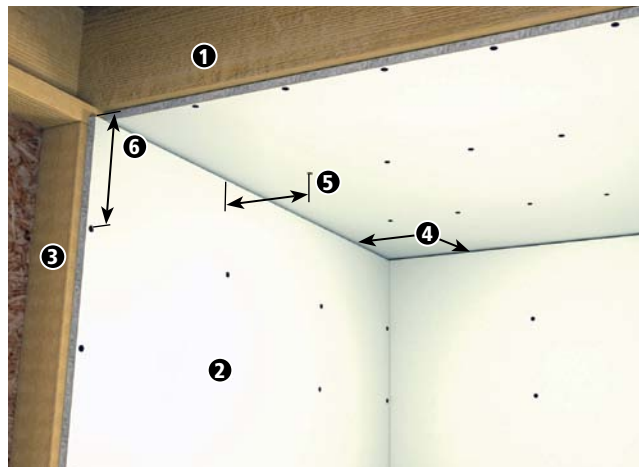
ADHESIVE APPLICATION

Apply gypsum board adhesive to the face of studs or joists in continuous beads not less than 3/8 in. (9.5 mm) in diameter. Where end or edge joints occur on a framing member, apply two parallel beads of adhesive not less than 3/8 in. (9.5 mm) in diameter, one near each edge of the framing member.

FLOATING ANGLE METHOD

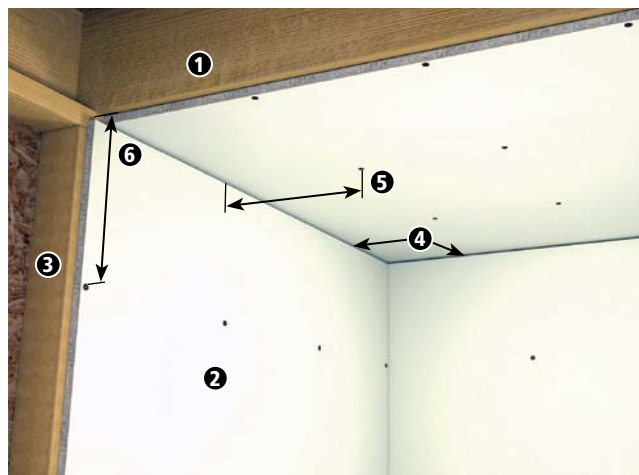
Apply gypsum board using the floating angle method eliminates perimeter nails where ceilings and walls meet. This method reduces the stress and strain on the board from movement of the framing. Refer to the diagrams below for details.

FLOATING CEILING CORNER – NAIL INSTALLATION



1. Ceiling Joist Framing
2. Gypsum Board
3. Wall Framing
4. Floating Interior Angles
5. Ceiling: 7 in. (178 mm) o.c.
6. Wall: 8 in. (203 mm) o.c.

FLOATING CEILING CORNER – SCREW INSTALLATION

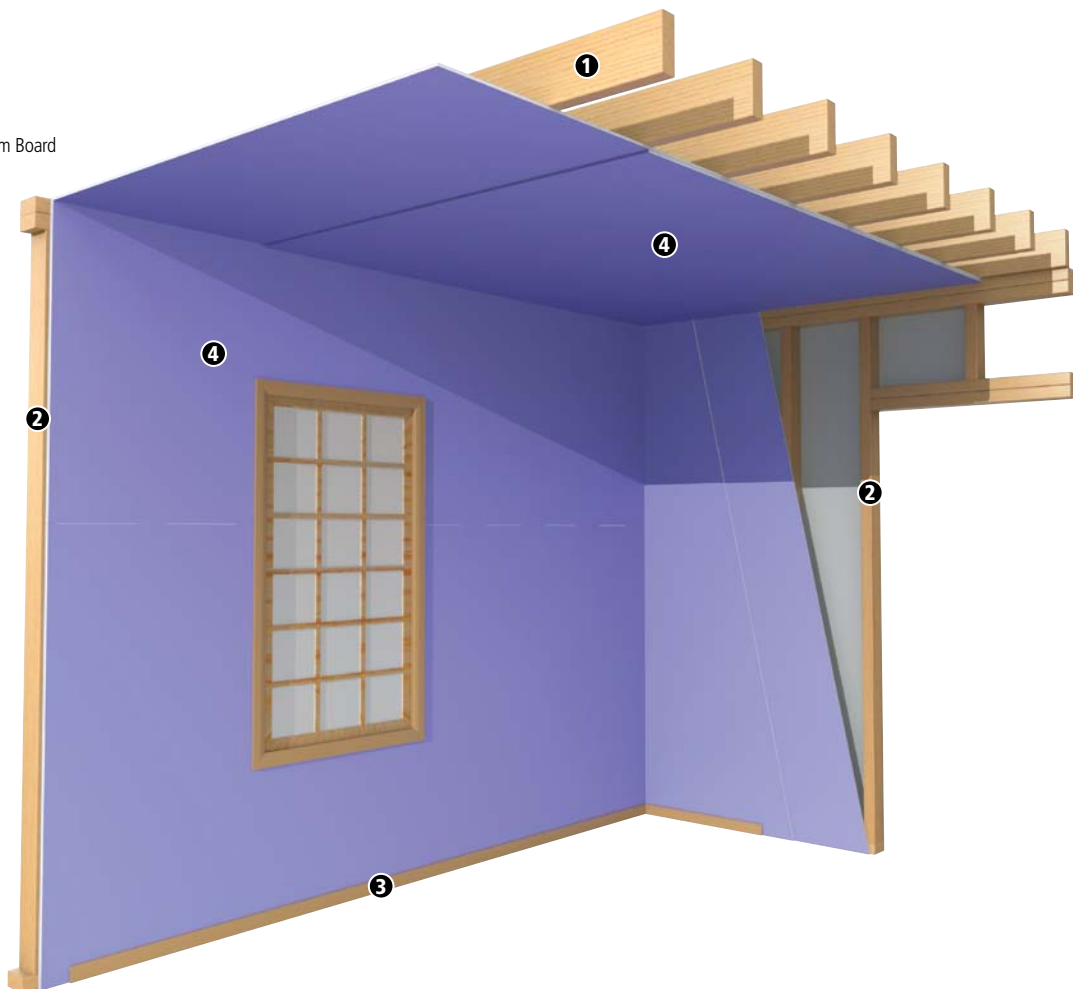


1. Ceiling Joist Framing
2. Gypsum Board
3. Wall Framing
4. Floating Interior Angles
5. Ceiling: 12 in. (305 mm) o.c.
6. Wall: 16 in. (406 mm) o.c.
Floating Ceiling: 12 in. (305 mm) o.c.

Double-Layer Construction

The double-layer construction system consists of multiple layers of Gold Bond® BRAND Gypsum Board applied to wood framing. A variety of specialty products may be used to provide mold resistance, abuse resistance or sound damping. When used as a face layer, acoustically enhanced Gold Bond® BRAND SoundBreak® XP® Gypsum Board provides optimal acoustical performance and sound reduction.

1. Ceiling Joists
2. 2x4 Wood Framing
3. Base
4. Tapered-Edge Gypsum Board



BASE LAYER

The base layer is applied on ceilings first, and then on walls. For mechanical attachment of the face layer, locate nails a maximum of 16 in. (406 mm) o.c. on ceilings and 24 in. (610 mm) o.c. on walls. Locate screws a maximum of 24 in. (610 mm) o.c. for both ceilings and walls. For adhesive application of the face layer, apply the base layer in the same manner as a single-layer application. Drive fasteners flush with the board surface and do not treat joints. Base layer joints offset from face layer joints minimum 16 in. (406 mm). Do not secure the base layer to framing with clips.

MECHANICAL APPLICATION OF FACE LAYER

For non-rated construction, use nails of a length to provide 7/8 in. (22.2 mm) minimum penetration into the framing and spaced a maximum of 7 in. (178 mm) o.c. on ceilings and 8 in. (203 mm) o.c. on walls. Type W screws should be of a length to provide 5/8 in. (15.9 mm) minimum penetration into the framing and spaced a maximum of 12 in. (305 mm) on ceilings and 16 in. (406 mm) o.c. on walls when framing is spaced 16 in. (406 mm) o.c. Locate Type W screws 12 in. (305 mm) o.c. on walls and ceilings when framing is spaced 24 in. (610 mm) o.c.

Wood Frame Walls And Ceilings

ADHESIVE APPLICATION OF FACE LAYER

Use one of the following adhesives:

- A.** ProForm® BRAND All-Purpose Ready Mix Joint Compound or ProForm® BRAND Quick Set™ Setting Compound applied with a notched spreader with 1/4 in. x 1/4 in. (6.4 mm x 6.4 mm) notches spaced maximum 2 in. (50.8 mm) o.c. to the back side of the finish layer.
- B.** Drywall adhesive meeting ASTM C557 applied with a caulking gun in 3/8 in. (9.5 mm) diameter beads spaced 16 in. (406 mm) o.c. to base layer or back of face layer. Apply a perimeter bead 1 in. (25.4 mm) from panel edge.

Position the finish layer on the wall or ceiling within 10 minutes. Locate all joints a minimum of 10 in. (254 mm) from parallel joints in the base layer. Hold in place with temporary nails or Type G drywall screws or bracing to ensure adequate contact and alignment of the gypsum boards. When the bond has developed (usually 24 hours), remove the temporary fasteners or bracing. Fill resulting holes flush to the surface with joint compound and finish the joints.

FIRE-RESISTANCE RATINGS

For fire or acoustical ratings, please refer to the Fire And Sound Selector guide on pages 32-62. For complete construction details, consult the specific test report.

Recommendations

- Install gypsum board in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.
- Install batt or blanket ceiling insulation BEFORE the gypsum board on ceilings when installing a vapor retarder behind the gypsum board. Install the insulation IMMEDIATELY after the gypsum board when using loose fill insulation. Avoid installation practices that might allow condensation to form behind boards.
- Cut gypsum board to allow for a minimum 1/4 in. (6.4 mm) gap between gypsum board and floor to prevent potential wicking of moisture.
- Locate gypsum board joints at openings so that no joint will occur within 12 in. (305 mm) of the edges of the openings unless installing control joints at these locations.
- Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Hold gypsum board in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the face paper of the gypsum board. Remove improperly driven nails or screws.
- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the gypsum board and during joint treatment, texturing and decoration beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.

Limitations

- Apply 1/4 in. (6.4 mm) Gold Bond® BRAND Gypsum Board to existing surfaces only. Do not apply 1/4 in. (6.4 mm) gypsum board directly to framing members, except when using with other thicknesses in double-layer systems tested for specific purposes. Existing walls and ceilings should be sound, flat, level and without void spaces. Apply 1/4 in. (6.4 mm) gypsum board with a combination of mechanical fasteners and adhesive between framing members to bond the gypsum board to the substrate.
- Do not use 3/8 in. (9.5 mm) Gold Bond® BRAND Gypsum Board on framing members over 16 in. (406 mm) o.c. Apply gypsum board to ceilings at right angles to the framing members. Do not use 3/8 in. (9.5 mm) gypsum board to support insulation. Do not use 1/2 in. (12.7 mm) or 5/8 in. (15.9 mm) gypsum board on framing over 24 in. (610 mm) o.c.
- All ends and edges of gypsum board should occur over framing members or other solid backing, except where treated joints occur at right angles to framing or furring members.
- Hold the gypsum board firmly against the framing while fastening with nails or screws. Start at the center and work toward each end and edge, spacing the fasteners as recommended for each type of application.
- Support lighting and other fixtures by framing. Do not use gypsum board to support them.
- Apply 1/2 in. (12.7 mm) or 5/8 in. (15.9 mm) gypsum board at right angles to framing on ceilings to be decorated with spray textures. Framing should not exceed 16 in. (406 mm) o.c. for 1/2 in. (12.7 mm) regular gypsum board and 24 in. (610 mm) o.c. for Gold Bond® BRAND 1/2 in. (12.7 mm) High Strength Ceiling Board, 1/2 in. (12.7 mm) Gold Bond BRAND High Strength LITE® Gypsum Board and 5/8 in. (15.9 mm) Gold Bond® BRAND Fire-Shield® Gypsum Board.
- For a spray texture finish, prime gypsum board ceilings with a sealing latex primer and allow it to dry before spraying. This will help minimize gypsum board sagging and discoloration.

Using water-based spray textures may cause unprimed gypsum board to sag when any one or more of the following conditions exist:

- Unventilated buildings
- Use of vapor retarders under certain conditions
- Poor drying conditions
- Inadequate framing support
- Improper type or thickness of gypsum board

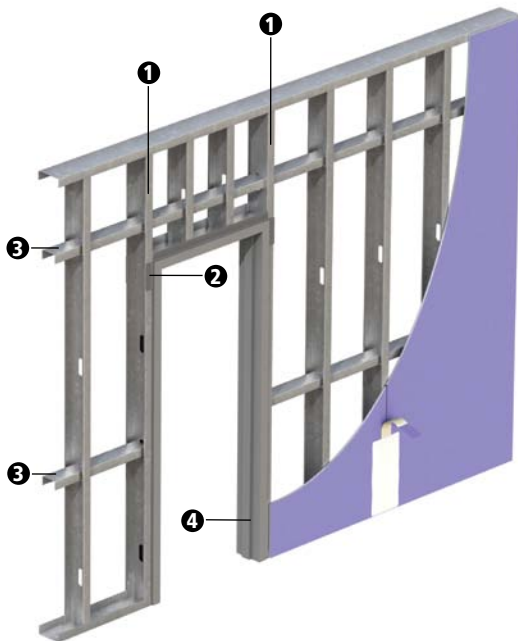
Non-Loadbearing Steel Stud Partitions

Steel stud gypsum board partitions are comprised of steel floor and ceiling tracks, steel studs and Gold Bond® BRAND Gypsum Board, which is attached with drywall screws. Metal products are to meet or exceed all applicable ASTM standards.

Apply gypsum board horizontally or vertically in single or multiple layers. For system-specific fire and sound ratings, please refer to pages 32-62.

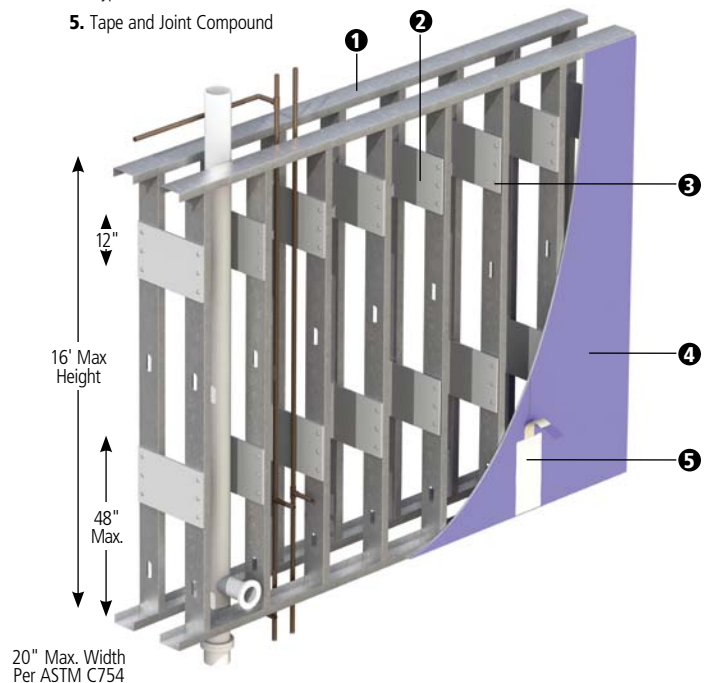
SINGLE-LAYER CONSTRUCTION

1. Fasten Jamb Studs to Track Top and Bottom
2. Track – Cut and Bent Down
3. C.R. Channel Stiffeners – Friction Fit (Optional)
4. Steel Door Frame



CHASE WALL CONSTRUCTION

1. Steel Track
2. 1/2" Gypsum Board or Stud Track – 2 Screws per Stud (Alternate)
3. 3 Drywall Screws per Stud
4. Gypsum Board
5. Tape and Joint Compound



Non-Loadbearing Steel Stud Partitions

ADVANTAGES

Openings or knockouts throughout the length of the steel studs permit the easy horizontal routing of water, gas and electrical conduit. You may also use these openings to install Cold-Rolled Channel stiffeners where increased rigidity is required. Interruption of the floor and ceiling track allows the vertical installation of larger utilities.

Fire Resistance: These systems have 1-, 2-, 3- and 4-hour fire ratings (for details refer to pages 32-62).

Sound Resistance: Assemblies requiring a Sound Transmission Class (STC) may be achieved through the use of several variations of these systems (for details refer to the Fire And Sound Selector on pages 32-62).

Technical Data

PARTITION HEIGHTS

Use light-gauge steel studs to frame non-loadbearing partitions, which are limited in height by deflection resulting from extraneous horizontal forces. For any given horizontal load, the amount of deflection increases as the height of the partition rises.

Table 1 and Table 2 (on page 313) show maximum partition heights based on specific design criteria. The height limits shown are based on the gypsum board and the steel studs acting as a composite section to provide a maximum deflection of $L/120$, $L/240$, $L/360$ (L = partition height in inches) with a horizontal load of 5 psf, 7.5 psf, and 10 psf of partition surface.

You may increase the rigidity by placing stiffener channels through the steel stud knockouts, by using two layers of gypsum board, or by decreasing the stud spacing.

Use standard 25- and 20-gauge studs for interior partitions.

They have height limits as shown in Table 1 and Table 2. Attach gypsum board to full height on both sides of studs with Type S bugle-head drywall screws (Type S-12 for 20-gauge studs) spaced not more than 12 in. (305 mm) o.c. on all studs when framing is 24 in. (610 mm) o.c. and 16 in. (406 mm) o.c. if framing is 16 in. (406 mm) o.c. or less. Screw lengths must be not less than $3/8$ in. (9.5 mm) greater than the total thickness of the gypsum board being fastened.

Use 20-gauge steel studs for exterior, non-loadbearing curtain wall systems. Also use them for interior partitions to provide more rigidity or greater heights than can be attained with standard 25-gauge studs.

Limitations

1. Maximum stud spacing for a single-layer application of $1/2$ in. (12.7 mm) and $5/8$ in. (15.9 mm) gypsum board is 24 in. (610 mm) o.c. When applying $3/8$ in. (9.5 mm) gypsum board, maximum stud spacing is 16 in. (406 mm) o.c.
2. Where installing long, continuous runs of gypsum board, provide control joints every 30 ft. (9,144 mm) or less.
3. Where structural movement may impose direct loads on these systems, isolation details are required.
4. To prevent weakening due to calcining, do not expose gypsum board to temperatures over 125°F (52°C) for extended periods of time.
5. Gypsum board joints should not occur within 12 in. (305 mm) of the corners of door frames, unless installing control joints at these locations.
6. Where reference is made to nominal gauges, 25-gauge relates to a minimum base steel of .0179 in. (0.45 mm), and 20-gauge to .0329 in. (0.84 mm).

TABLE 1

25-GAUGE STUDS/PARTITION LIMITING HEIGHTS					
Stud Depth	Stud Spacing	Deflection Limit	Lateral Pressure		
			5 psf (240 Pa)	7.5 psf (360 Pa)	10 psf (480 Pa)
1-5/8 in. (41.3 mm)	12 in. (305 mm)	L/120 L/240 L/360	11-2 (3400) 8-10 (2690)	9-9 (2970)	8-10 (2690)
	16 in. (406 mm)	L/120 L/240 L/360	10-7 (3230) 8-4 (2540)	8-10 (2690)	8-4 (2540)
	24 in. (610 mm)	L/120 L/240 L/360	9-9 (2970) 7-11 (2410)	8-0 (2440)	
2-1/2 in. (63.5 mm)	12 in. (305 mm)	L/120 L/240 L/360	15-1 (4600) 11-11 (3630) 10-5 (3180)	12-4 (3760) 10-5 (3180) 9-1 (2770)	10-9 (3280) 9-6 (2900)
	16 in. (406 mm)	L/120 L/240 L/360	13-3 (4040) 11-3 (3430) 9-10 (3000)	10-10 (3300) 9-10 (3000) 8-7 (2620)	9-5 (2570) 8-11 (2720)
	24 in. (610 mm)	L/120 L/240 L/360	11-10 (3610) 10-7 (3230) 9-3 (2820)	9-8 (2950) 9-3 (2820) 8-1 (2460)	8-5 (2570) 8-5 (2570)
3-1/2 in. (88.9 mm)	12 in. (305 mm)	L/120 L/240 L/360	17-8 (5380) 15-4 (4670) 13-3 (4040)	14-3 (4340) 13-3 (4040) 11-7 (3530)	12-5 (3780) 12-0 (3660) 10-5 (3180)
	* 16 in. (406 mm)	L/120 L/240 L/360	15-4 (4670) 14-4 (4370) 12-4 (3760)	12-5 (3780) 12-5 (3780) 10-10 (3300)	10-9 (3280) 10-9 (3280) 9-9 (2970)
	24 in. (610 mm)	L/120 L/240 L/360	13-9 (4190) 13-5 (4090) 11-7 (3530)	11-0 (3350) 11-0 (3350) 10-1 (3070)	9-5 (2870) 9-5 (2870) 9-1 (2770)
4 in. (101.6 mm)	12 in. (305 mm)	L/120 L/240 L/360	19-6 (5940) 16-5 (5000) 14-4 (4370)	15-9 (4800) 14-4 (4370) 12-6 (3810)	13-8 (4170) 13-0 (3960) 11-4 (3450)
	16 in. (406 mm)	L/120 L/240 L/360	17-2 (5230) 15-4 (4670) 13-4 (4060)	13-10 (4220) 13-4 (4060) 11-8 (3560)	11-11 (3630) 11-11 (3630) 10-6 (3200)
	24 in. (610 mm)	L/120 L/240 L/360	15-1 (4600) 14-2 (4320) 12-4 (3760)	12-1 (3680) 12-1 (3680) 10-9 (3280)	10-5 (3180) 10-5 (3180) 9-9 (2970)
6 in. (152.4 mm)	12 in. (305 mm)	L/120 L/240 L/360	22-10 (6960) 22-1 (6730) 19-4 (5890)	18-7 (5660) 18-7 (5660) 16-9 (5110)	16-2 (4930) 16-2 (4930) 15-0 (4570)
	16 in. (406 mm)	L/120 L/240 L/360	19-9 (6020) 19-9 (6020) 17-11 (5460)	16-2 (4930) 16-2 (4930) 15-7 (4750)	14-0 (4270) 14-0 (4270) 3-10 (4220)
	24 in. (610 mm)	L/120 L/240 L/360	16-9 (5110) 16-9 (5110) 16-9 (5110)	13-5 (4090) 13-5 (4090) 13-5 (4090)	11-5 (3480) 11-5 (3480) 11-5 (3480)

Note: Limiting height tables adapted with permission from ASTM C 754. Copyright ASTM. Tables based on tests conducted with gypsum board attached with screws 12" o.c. to framing.

* Applicable for 3-5/8" stud depth.

TABLE 2

20-GAUGE STUDS/PARTITION LIMITING HEIGHTS					
Stud Depth	Stud Spacing	Deflection Limit	Lateral Pressure		
			5 psf (240 Pa)	7.5 psf (360 Pa)	10 psf (480 Pa)
1-5/8 in. (41.3 mm)	12 in. (305 mm)	L/120 L/240 L/360	13-0 (3960) 10-4 (3150) 9-0 (2740)	11-4 (3450) 9-0 (2740)	10-4 (3150)
	16 in. (406 mm)	L/120 L/240 L/360	12-1 (3680) 9-8 (2950) 8-5 (2570)	10-7 (3230) 8-5 (2570)	9-8 (2950)
	24 in. (610 mm)	L/120 L/240 L/360	11-0 (3350) 8-9 (2670) 7-8 (2340)	9-7 (2920) 7-8 (2340)	8-9 (2670)
2-1/2 in. (63.5 mm)	12 in. (305 mm)	L/120 L/240 L/360	17-9 (5410) 13-11 (4240) 12-1 (3680)	15-6 (4720) 12-1 (3680) 10-6 (3200)	13-11 (4240) 10-11 (3300) 9-5 (2870)
	16 in. (406 mm)	L/120 L/240 L/360	16-5 (5000) 12-10 (3910) 11-2 (3400)	14-4 (4370) 13-4 (4340) 9-8 (2950)	12-10 (3910) 10-0 (3050) 8-8 (2640)
	24 in. (610 mm)	L/120 L/240 L/360	14-10 (4520) 11-7 (3530) 10-0 (3050)	13-0 (3960) 10-0 (3050) 8-7 (2620)	11-7 (3530) 8-11 (2720) 7-8 (2340)
3-1/2 in. (88.9 mm)	12 in. (305 mm)	L/120 L/240 L/360	22-6 (6860) 17-10 (5440) 15-6 (4720)	19-8 (5990) 15-6 (4720) 13-7 (4140)	17-10 (5440) 14-1 (4290) 12-4 (3760)
	* 16 in. (406 mm)	L/120 L/240 L/360	20-8 (6300) 16-5 (5000) 14-3 (4340)	18-1 (5510) 14-3 (4340) 12-6 (3810)	16-5 (5000) 12-11 (3940) 11-4 (3450)
	24 in. (610 mm)	L/120 L/240 L/360	18-6 (5640) 14-9 (4500) 12-9 (3890)	16-2 (5840) 12-9 (3890) 11-2 (3400)	14-9 (4500) 11-7 (3530) 10-1 (3070)
4 in. (101.6 mm)	12 in. (305 mm)	L/120 L/240 L/360	25-1 (7650) 19-11 (6070) 17-4 (5280)	21-11 (6680) 17-4 (5280) 15-0 (4570)	19-11 (6070) 15-8 (4780) 13-7 (4140)
	16 in. (406 mm)	L/120 L/240 L/360	23-1 (7040) 18-4 (5590) 15-11 (4850)	20-2 (6150) 15-11 (4850) 13-9 (4190)	18-4 (5590) 14-5 (4390) 12-6 (3810)
	24 in. (610 mm)	L/120 L/240 L/360	20-9 (6320) 16-5 (5000) 14-3 (4340)	18-1 (5510) 14-3 (4340) 12-4 (3760)	16-5 (5000) 12-10 (3910) 11-2 (3400)
6 in. (152.4 mm)	12 in. (305 mm)	L/120 L/240 L/360	33-9 (10290) 26-9 (8150) 23-5 (7140)	29-6 (8990) 23-5 (7140) 20-6 (6250)	26-9 (8150) 21-3 (6480) 18-7 (5660)
	16 in. (406 mm)	L/120 L/240 L/360	30-10 (9400) 24-6 (7470) 21-4 (6500)	27-0 (8230) 21-4 (6500) 18-9 (5720)	24-6 (7470) 19-5 (5920) 17-0 (5180)
	24 in. (610 mm)	L/120 L/240 L/360	27-2 (8280) 21-7 (6580) 18-10 (5740)	23-10 (7260) 18-10 (5740) 16-7 (5050)	19-1 (5820) 17-3 (5260) 15-0 (4570)

Non-Loadbearing Steel Frame Partitions

GYPSUM BOARD METAL FRAMING

25- And 20-Gauge Studs

"C" shaped metal studs fabricated from galvanized steel. 20-gauge studs are for curtainwall construction or more rigid partitions.

25- And 20-Gauge Track

Fastened at floor and ceiling to support the steel studs. Track is channel-shaped and fabricated from galvanized steel.

Cold-Rolled Channel

Used in suspended ceilings and as stiffeners in steel stud partitions.

Furring Channel

Used as cross-furring members to attach gypsum board or lath on ceilings or furred masonry walls.

Resilient-Furring Channel

Used as cross-furring members in sound-rated gypsum board partitions.

Z-Furring Channel

Generally used on the inside of exterior masonry walls to support rigid foam insulation and to provide a fastening surface for gypsum board.

Floor And Ceiling Runner

Used to anchor studs to floor and ceiling.

Recommendations

FRAMING

Align floor and ceiling tracks to ensure plumb partition. Secure track with suitable fasteners at a maximum of 24 in. (610 mm) o.c. Position studs in track on 16 in. (406 mm) or 24 in. (610 mm) centers by rotating into place for a friction fit. Install steel studs with all flanges pointed in the same direction. Secure studs located adjacent to door and window frames, partition intersections and corners with 3/8 in. (9.5 mm) pan head Type S screws. Drive screws through both flanges of studs and tracks or by using a stud clincher.

SINGLE LAYER OR FIRST PLY

Cut gypsum board to allow for a minimum 1/4 in. (6.4 mm) gap between gypsum board and floor to prevent potential wicking.

Apply gypsum board with the length parallel or at right angles to the studs. Center vertical ends or edges over the stud flanges.

For steel framing, screws should be Type S, of a length to provide not less than 3/8 in. (9.5 mm) penetration into framing.

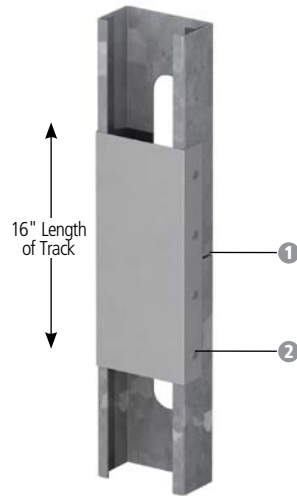
For non-fire-rated construction, attach with screws no more than 12 in. (305 mm) o.c. when framing is 24 in. (610 mm) o.c. and no more than 16 in. (406 mm) o.c. when framing is 16 in. (406 mm) o.c. or less. For vertical application of fire-rated construction, space screws 12 in. (305 mm) o.c. in the field and 8 in. (203 mm) o.c. along the vertical abutting edges, unless otherwise specified. For vertical gypsum board application with studs 24 in. (610 mm) o.c., erect the gypsum board on one side of the partition, and fasten gypsum board to the open end of stud flange first at vertical gypsum board joints. Complete the gypsum board application of the entire side of the partition in this manner. Vertical gypsum board joints on opposite sides of a partition should be staggered and not occur on the same stud. Secure the gypsum board to the studs so it will fit tight against the steel framing.

FACE LAYER

To mechanically attach the face layer for fire- or sound-rated construction, it must meet the specifications of the selected system. When attaching the face ply with mechanical fasteners and no adhesive between plies, the maximum spacing and minimum penetration for screws should be the same as for single-ply applications.

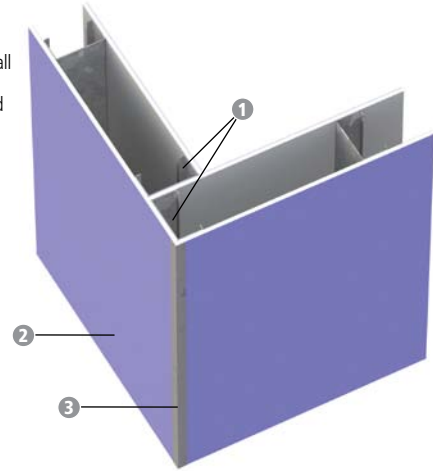
STUD SPLICE

1. Studs Butted
2. 4 Pan-Head Screws – Each Side



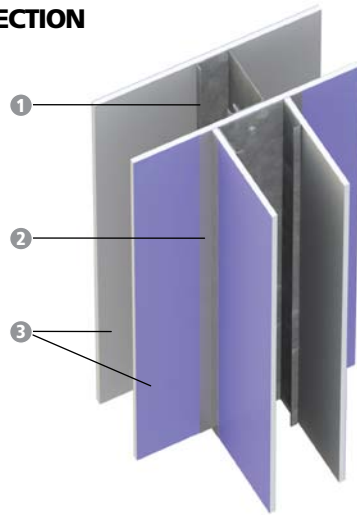
CORNER DETAIL

1. 3-5/8" Steel Stud
Locate at Abutting Wall
and Attach Through
Gypsum Board to Stud
in Abutting Wall
2. Gypsum Board
3. Cornerbead



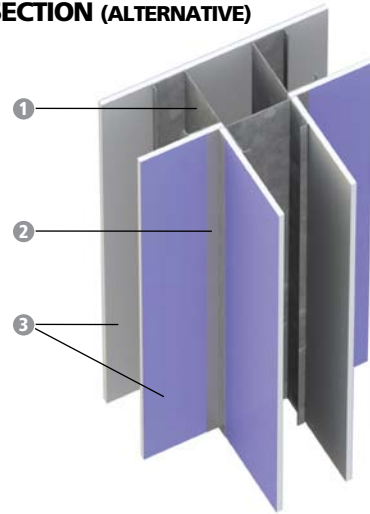
PARTITION INTERSECTION

1. Steel Stud
2. Tape and Joint Compound
3. Gypsum Board



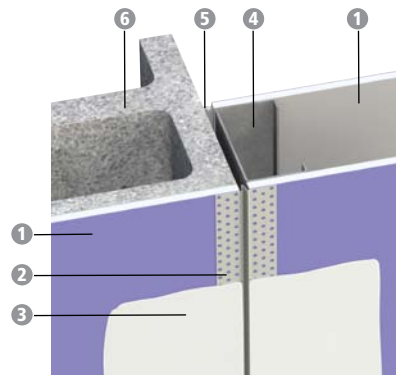
PARTITION INTERSECTION (ALTERNATIVE)

1. Steel Stud
2. Tape and Joint Compound
3. Gypsum Board



JOINT WHERE WALL FRAMING CHANGES

1. Gypsum Board
2. Control Joint
3. Joint Compound
4. Steel Stud
5. Caulk
6. Masonry Wall



ATTACHMENT TO CONCRETE SLAB

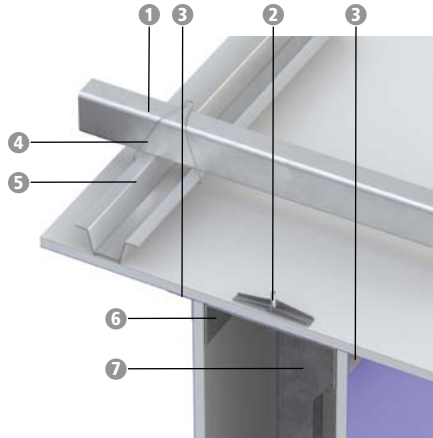
1. Ceiling Track
2. Steel Stud
3. Caulk
4. Casing Bead



Non-Loadbearing Steel Frame Partitions

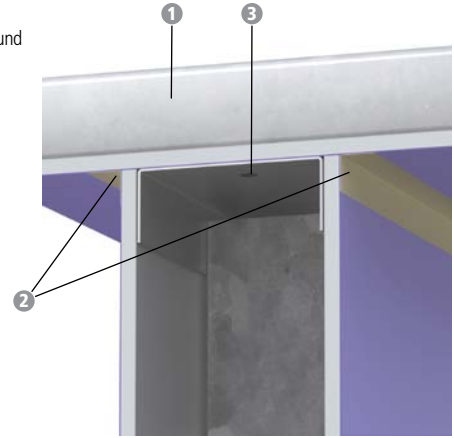
ATTACHMENT TO SUSPENDED CEILING

1. 1-1/2" C.R. Channel
2. Toggle Bolt or Molly
3. Tape and Joint Compound
4. Furring Channel Clip
5. Furring Channel
6. Steel Track
7. Steel Stud



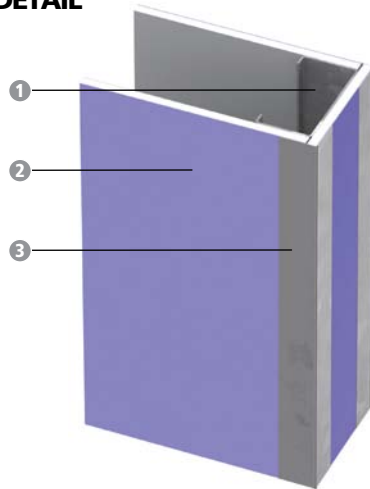
ATTACHMENT TO FURRED CEILING

1. Furring Channel
2. Tape and Joint Compound
3. Type S Drywall Screw



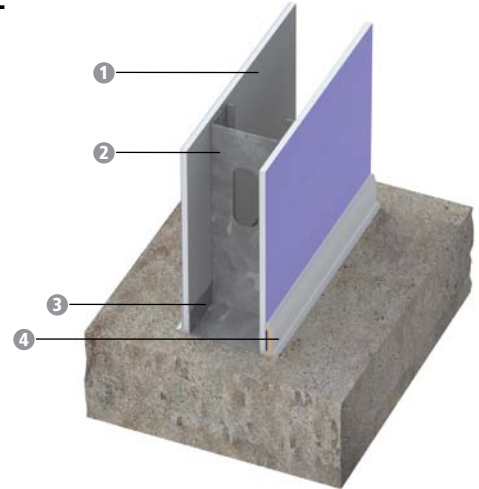
PARTITION END DETAIL

1. Steel Stud
2. Gypsum Board
3. Drywall Cornerbead



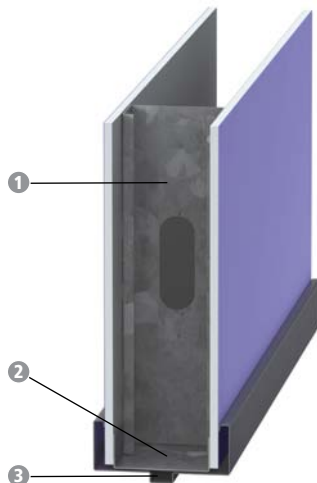
BASE DETAIL

1. Gypsum Board
2. Steel Stud
3. Floor Track
4. Wall Base



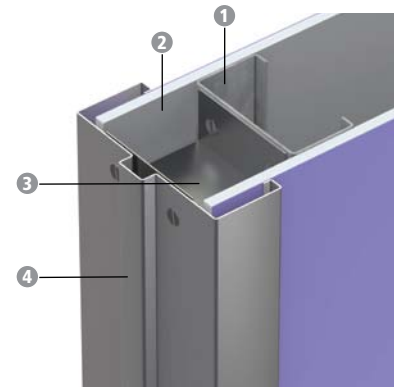
DOOR HEAD DETAIL – METAL

1. Steel Stud
2. Steel Track
3. Metal Door Head



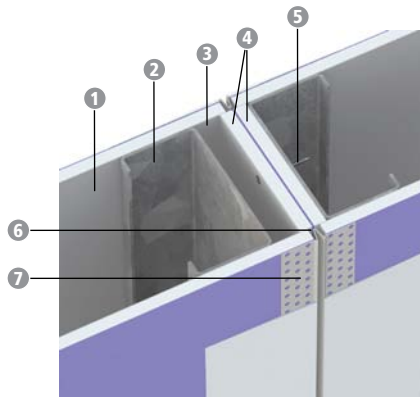
DOOR JAMB DETAIL – METAL

1. Steel Stud
2. Gypsum Board
3. Jamb Anchor Clip
4. Metal Door Jamb



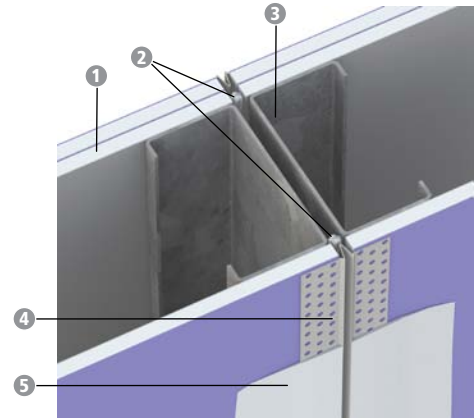
1-HOUR FIRE-RATED CONTROL JOINT DETAIL

1. 5/8" Fire-Shield®
2. 2-1/2" Steel Studs
3. 5/8" Gap
4. 5/8" Fire-Shield® Strips
5. 1-5/8" Drywall Screws, 24" o.c.
6. 1/2" Gap Between Board Ends
7. Control Joint



NON-RATED CONTROL JOINT DETAIL

1. Gypsum Board
2. Sealant
3. Steel Stud
4. Control Joint
5. Joint Compound



Steel Frame Ceilings – Furring Channels Or Studs

Description

You may use the following steel furring members to attach gypsum board ceilings:

- Furring Channels
- Steel Studs

Both will fasten to the lower chord of steel joists or cold-rolled channels in suspended ceiling construction, but the methods will vary. Secure Furring Channels with clips or tie wires. Apply Gold Bond[®] BRAND Gypsum Board using drywall screws spaced not more than 12 in. (305 mm) o.c.

Recommendations

The use of these furring systems with steel joist construction and gypsum board constitutes non-combustible construction. To achieve specific fire-resistance ratings, please refer to page 32.

DIRECT ATTACHMENT

1. To space and position furring channels, follow the manufacturer's recommendations. Tie Wire Furring Channels and Steel Studs as illustrated on page 319.
2. Apply gypsum board with its long dimension at right angles to the channels. Locate gypsum board butt joints over the center of the furring channels. Attach gypsum board with 1 in. (25.4 mm) self-drilling drywall screws 12 in. (305 mm) o.c., located not less than 3/8 in. (9.5 mm) or more than 1/2 in. (12.7 mm) from the edges.

SUSPENDED

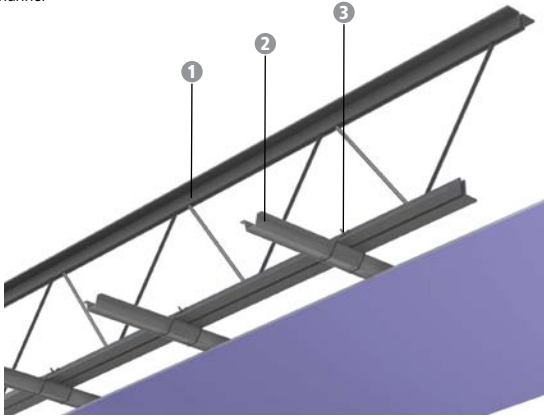
1. Install 1-1/2 in. (38.1 mm) cold-rolled channels 4 ft. (1,219 mm) o.c. with 8-gauge hanger wire, spaced a maximum of 4 ft. (1,219 mm) o.c.
2. Installing steel furring channel 2 ft. (610 mm) with clips or wire ties at each joist intersection.
3. Apply gypsum board with its long dimension at right angles to the channels. Locate gypsum board butt joints over the center of the furring channels. Attach gypsum board with 1 in. (25.4 mm) self-drilling drywall screws 12 in. (305 mm) o.c., located not less than 3/8 in. (9.5 mm) or more than 1/2 in. (12.7 mm) from the edges.

Limitations

1. Support lighting and other fixtures by framing. Do not support them from the gypsum board.
2. For large expanses of ceiling with perimeter relief, locate control joints a maximum of 50 ft. (15.2 m) o.c. in either direction. Without perimeter relief, locate control joints a maximum of 30 ft. (9,144 mm) o.c. in each direction.

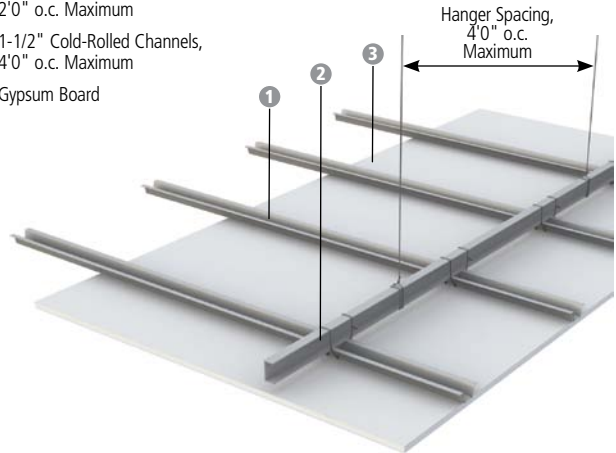
FURRING CHANNELS

1. Steel Bar Joist
2. Furring Channel
3. Tie Wire



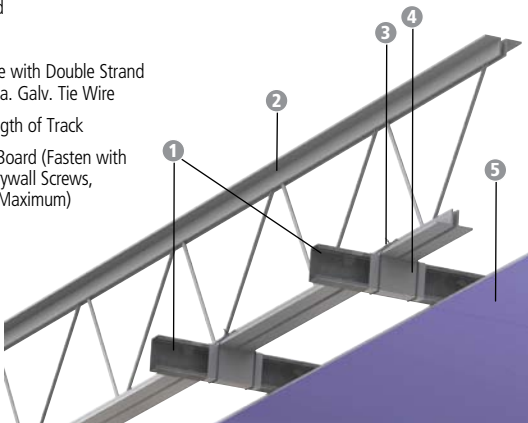
FURRING CHANNEL DETAILS

1. Furring Channel
2'0" o.c. Maximum
2. 1-1/2" Cold-Rolled Channels,
4'0" o.c. Maximum
3. Gypsum Board



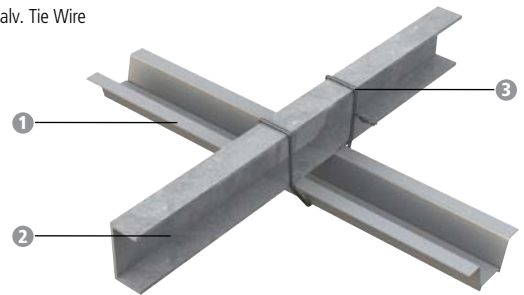
STEEL STUDS IN CEILING SYSTEM

1. Steel Stud
2. Bar Joist
3. Saddle Tie with Double Strand
No. 16-Ga. Galv. Tie Wire
4. Short Length of Track
5. Gypsum Board (Fasten with
Type S Drywall Screws,
12" o.c. Maximum)



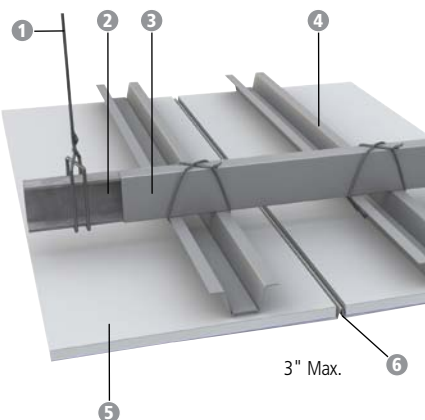
SADDLE TIE

1. Furring Channel
2. Cold-Rolled Channel
3. No. 16-Ga. Galv. Tie Wire



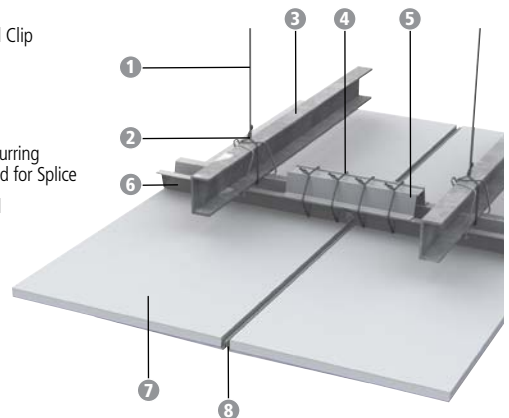
CONTROL JOINT PARALLEL TO FURRING CHANNELS

1. Hanger Wire, Furring
Channel Clip, or Tie Wire
2. 1-1/2" Channel Piece,
16" Long, Nested
(Two Tie Wires Each Side)
3. 1-1/2" Channel
4. Furring Channel
5. Gypsum Board
6. Control Joint



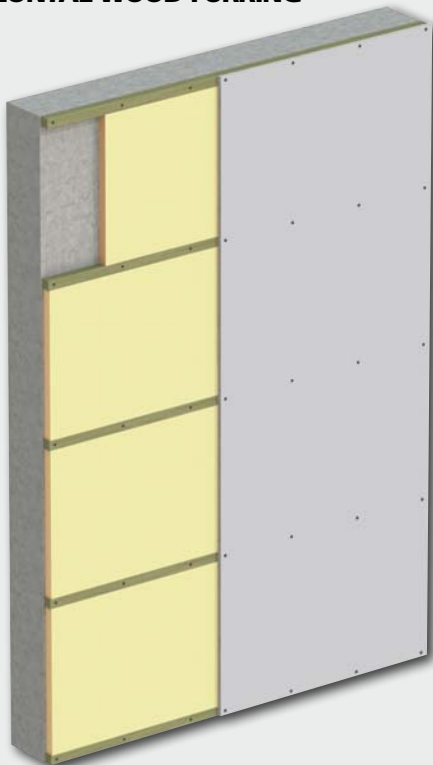
CONTROL JOINT PERPENDICULAR TO FURRING CHANNELS

1. Hanger Wire
2. Furring Channel Clip
or Tie Wire
3. 1-1/2" Channel
4. Tie Wire
5. Short Piece of Furring
Channel Inverted for Splice
6. Furring Channel
7. Gypsum Board
8. Control Joint

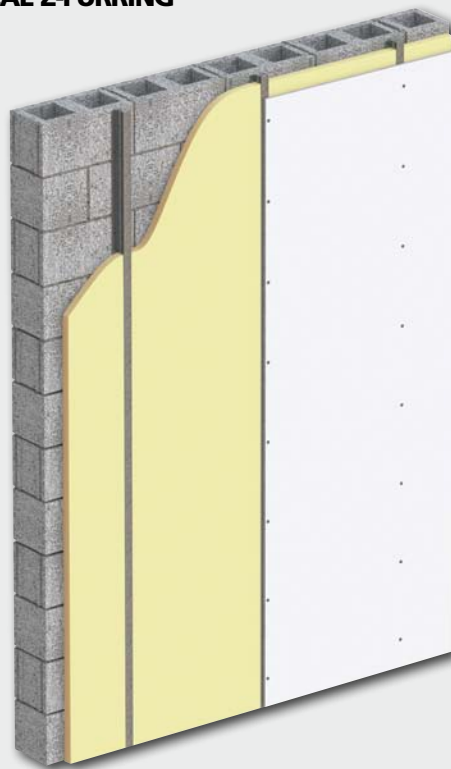


Gypsum Board Over Masonry Or Monolithic Concrete

HORIZONTAL WOOD FURRING



VERTICAL Z-FURRING



Application Methods

A. LAMINATION

Masonry or monolithic concrete shall be above grade; dry; and free of dust, loose particles, oil, grease or other foreign material.

Use joint compound as adhesive. Mix to a consistency thick enough to allow a 2 in. (50.8 mm) daub to stick to the underside of a broad knife held parallel to the floor.

Apply 2 in. (50.8 mm) to 2-1/2 in. (63.6 mm) diameter daubs of adhesive 1/2 in. (12.7 mm) thick, 12 in. (305 mm) o.c. in both directions to the masonry wall or continuous beads spaced not more than 1/2 in. (12.7 mm). Beads shall not be less than 3/8 in. (9.5 mm) in diameter. The adhesive layout must provide for a

row of daubs located a maximum of 2 in. (50.8 mm) from board ends, and carefully center daubs or beads on vertical joints. Do not apply more adhesive to the wall than what will be covered with board in 15 minutes. Approximate coverage for joint compound (powder) used as an adhesive is 30-35 lbs./1,000 sq. ft.

Cut gypsum board to allow for 1/4 in. (6.4 mm) minimum clearance between board and floor to prevent potential wicking.



Gypsum Board Over Masonry Or Monolithic Concrete

Install gypsum board by hand, pressing each board tight to the wall and ensuring that all daubs are in positive contact with the board. Butt boards to each previously positioned board to ensure flush joints.

If necessary to hold boards straight, plumb and in proper alignment, drive masonry nails through small wood blocks and into masonry at high points only.

Fill all holes and treat joints with tape and joint compound.

B. WOOD OR STEEL FURRING

Attach steel or wood furring members to masonry walls, either vertically or horizontally, a maximum of 24 in. (610 mm) o.c. with masonry fasteners spaced a maximum of 24 in. (610 mm) o.c. Where wood furring is used over solid masonry surfaces, the wood furring shall not be less than 3/4 in. (19.1 mm) x 1-1/2 in. (38.1 mm) actual size.

Attach single layer 1/2 in. (12.7 mm) or 5/8 in. (15.9 mm) gypsum board, either vertically or horizontally, to steel or wood furring with screws spaced a maximum of 12 in. (305 mm) o.c. or with nails spaced 8 in. (203 mm) o.c. for wood furring. Gypsum board joints that are parallel to furring must abut over furring channels. The attachment surface of abutting gypsum board edges or ends shall not be less than 1-1/2 in. (38.1 mm) wide for wood furring members and 1-1/4 in. (31.8 mm) wide for steel furring.

Finish all joints between gypsum panel products as described in GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*.

C. Z-FURRING AND RIGID INSULATION

Application Of Z-Furring Channel

Use Z-Furring Channel to secure rigid insulation and gypsum board to masonry or monolithic concrete walls. The insulation thickness – 1 in. (25.4 mm), 1-1/2 in. (38.1 mm) or 2 in. (50.8 mm) – determines the depth of the Z-Furring web. Apply the channel vertically and fasten to the masonry wall through the short, 3/4 in. (19.1 mm) flange with suitable masonry fasteners a maximum of 24 in. (610 mm) o.c. Install wood furring strips (nominal 2 in. (50.8 mm) wide x 1/32 in. [0.8 mm] greater than the foam thickness) around door and window openings. After fastening each Z-Furring Channel, fit a 24 in. (610 mm) wide floor-to-ceiling high insulation board between the wall and the wide, 1-1/4 in. (31.8 mm) flange.

Application Of Foam

Masonry or concrete surface must be dry and clean. It must also be free of dust, dirt, form release agents, oil, grease or water-soluble materials. Treat painted masonry as recommended for laminating to painted surfaces.

Insulation may be urethane foam or extruded polystyrene. Do not use expanded bead polystyrene. Apply adhesive to the foam insulation in 3/8 in. (9.5 mm) diameter beads continuously around the perimeter and through the field in the long direction with the beads spaced 12 in. (305 mm) o.c. Contact adhesive manufacturer for compatibility with foam.

Apply the foam boards to the wall with a sliding motion and then hand press the entire board to ensure full contact of adhesive and wall surface.

Application Of Gypsum Board

Erect gypsum board either vertically or horizontally to the Z-Furring Channels. Center the gypsum board edges or ends that run parallel to the channels and abut over the channels. Fasten gypsum board with 1 in. (25.4 mm) Type S screws and space them 12 in. (305 mm) o.c. When you have finished erecting the gypsum board, finish all joints and screw heads with ProForm® BRAND Joint Finishing System. Use ProForm® All-Purpose Joint Compounds. (Do not use water-based compounds to laminate prefinished boards to foam.)

Limitations

1. Use regular concrete nails for fastening to unit masonry. If block is old, pre-test nails to determine the optimum size and type to use.
2. Do not apply gypsum board in areas where it will be exposed to excessive moisture or continued high humidity.
3. Since foam plastic insulation is regulated by many building codes, consult with local building authorities before installing.
4. Since unprotected foam insulation may represent a fire hazard, cover it promptly and completely with gypsum board.

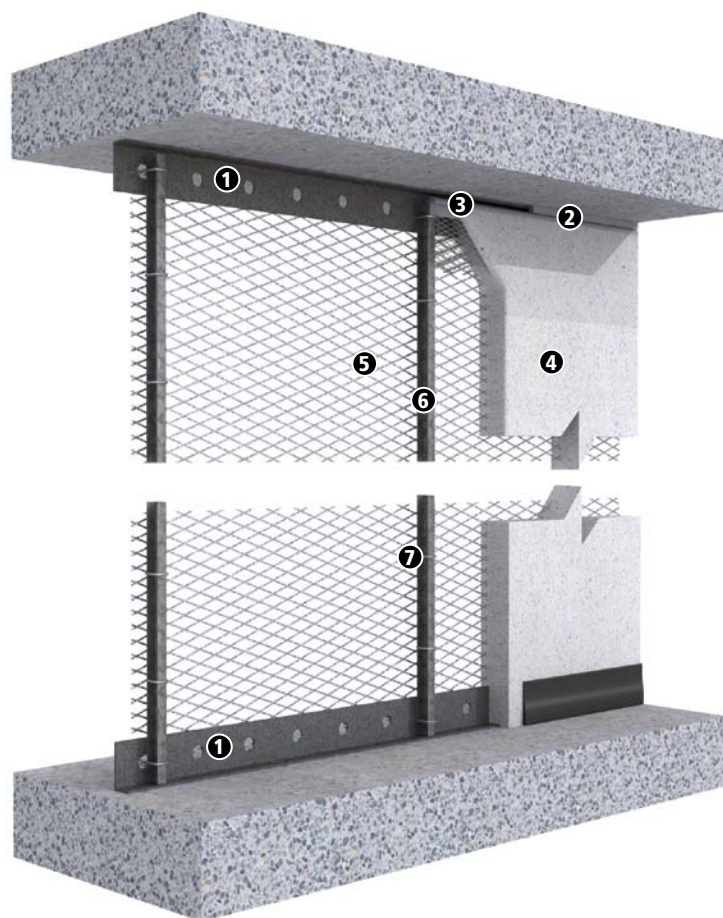
National 
Gypsum®

Conventional Plaster Systems

Conventional Gypsum Lath and Plaster Systems are the industry standard for historic preservation.

Lath and plaster deliver exceptional beauty and durability in interior partitions and non-loadbearing exterior walls. Conventional plaster systems are also commonly used as the panel material for radiant heating systems in ceilings.

Apply as two-coat systems (base or scratch and finish) or three-coat systems (scratch, brown and finish) over gypsum plaster base or expanded metal lath.



- 1. L-Runner
- 2. Sealant
- 3. Casing Bead
- 4. Sanded Gypsum Plaster
- 5. Metal Lath
- 6. Channel Stud
- 7. Tie Wire



Conventional Plaster Systems

Basic Uses

APPLICATIONS

Use gypsum plaster systems for all interior plastering except areas directly exposed to free water or severe moisture. When used with expanded metal lath, conventional plasters create a mechanical bond for maximum strength and durability. A gypsum plaster base such as Kal-Kore[®] Plaster Base is also very suitable as a base for conventional basecoat plasters. Gypsum moulding plasters are excellent for sculpting, casting decorative objects, and historic restoration matching and repair.

CONVENTIONAL PLASTER ADVANTAGES

- Provides a smooth, high-quality surface
- Requires no joint taping and finishing
- Resists nail pops better than gypsum board
- Enhances overall wall strength
- Offers high-impact and abrasion resistance
- Applications in multiple fire-rated assemblies, including column fireproofing
- Applications in STC-rated assemblies

Installation Recommendations

GENERAL

- A top-quality plastering job requires not only top-grade plaster but also careful planning, handling and storage of material. Plumb and true framing and properly installed plaster bases are equally vital. Examine the framing and bases carefully before proceeding with work.
- Install plaster base, plaster and accessories consistent with methods described in the noted standards, including ASTM C841 and ASTM C842, additional references listed in this document, and as indicated below.
- Apply reinforcement to areas of potential stress concentration, such as the intersection of door heads and jambs.
- Apply bonding compound on unit masonry and concrete substrates.
- Bring plaster to a true level surface without the application of additional water.
- Leave base-coat plaster surface rough to receive the finish coat.
- Tolerances: For flatness of surface, do not exceed 1/4 in. (6.4 mm) in 8 ft. (2,438 mm) for bow or warp of surface and for plumb and level.
- National Gypsum plaster products are formulated for hand and machine use. They may be pumped and machine-spray applied where appropriate.
- Do not retemper plaster mix.
- Keep tools and mixing equipment clean.

Gypsum Plaster Base Installation: Refer to Kal-Kore Plaster Base on page 145.

Expanded-Metal Lath and Accessory Installation: Refer to product manufacturer's written instructions.

Gold Bond® BRAND Two-Way Hardwall Plaster



TECHNICAL DATA

Packaging	49.5 lb. (22.5 kg) / Bag
Gypsum Plaster Base Applications	
– Approx. Coverage per Bag	40 – 50 sq. ft. (3.7 – 4.6 m ²)
– Applied Thickness	7/16" (11.1 mm)
– Aggregate Proportion	Sanded 1:2-1/2
Metal Lath Applications	
– Approx. Coverage per Bag	20 – 26 sq. ft. (1.9 – 2.4 m ²)
– Applied Thickness	9/16" (14.3 mm)
– Aggregate Proportion	Sanded 1:2-1/2
Brick, Clay Tile, Concrete Block Applications	
– Approx. Coverage per Bag	40 – 50 sq. ft. (3.7 – 4.6 m ²)
– Applied Thickness	9/16" (14.3 mm)
– Aggregate Proportion	Sanded 1:3

*Measured from face of lath.

NOTE: Sanded 1:2-1/2 means 1 part plaster to 2-1/2 parts sand by weight.

PHYSICAL PROPERTIES

Mix	Compressive Strength ASTM C472	Tensile Strength ASTM C472
Vermiculite Mix		
– Metal Lath and Gypsum Plaster Base (ASTM C516)	2 cu. ft. / 100 lb. (.06 m ³ / 45.4 kg)	500 lbf / sq. in. (3,445 kPa)
– Masonry (ASTM C516)	3 cu. ft. / 100 lb. (.08 m ³ / 45.4 kg)	300 lbf / sq. in. (2,067 kPa)
– Masonry (ASTM C516)	3 cu. ft. / 100 lb. (.08 m ³ / 45.4 kg)	90 lbf / sq. in. (620 kPa)
Perlite Mix		
– Metal Lath and Gypsum Plaster Base (ASTM C549)	2 cu. ft. / 100 lb. (.06 m ³ / 45.4 kg)	900 lbf / sq. in. (6,201 kPa)
– Masonry (ASTM C549)	3 cu. ft. / 100 lb. (.08 m ³ / 45.4 kg)	650 lbf / sq. in. (4,479 kPa)
– Masonry (ASTM C549)	3 cu. ft. / 100 lb. (.08 m ³ / 45.4 kg)	100 lbf / sq. in. (698 kPa)
Sand Mix		
1:1	1,600 lbf / sq. in. (11,024 kPa)	250 lbf / sq. in. (1,722 kPa)
1:2	1,150 lbf / sq. in. (7,923 kPa)	190 lbf / sq. in. (1,309 kPa)
1:3	750 lbf / sq. in. (5,168 kPa)	120 lbf / sq. in. (827 kPa)

DESCRIPTION

Gold Bond® BRAND Two-Way Hardwall Plaster is a basecoat gypsum neat plaster that requires the jobsite addition of an aggregate and water. When properly proportioned with aggregate, Two-Way Hardwall Plaster forms a hard, durable base for the finish coats of another gypsum plaster. Complies with ASTM C28.

Use Two-Way Hardwall Plaster with sand or expanded lightweight aggregate conforming to ASTM C35. It is mechanically mixed at the jobsite and the mortar conveyed to the work area. Apply it by hand or use it through pump/spray plastering machines.

Two-Way Hardwall Plaster consists of unaggregated gypsum plaster, and contains no asbestos.

APPLICATIONS

Two-Way Hardwall Plaster is designed for interior use over all accepted plaster bases as described in ASTM C842.

Two-Way Hardwall Plaster is intended to serve as a basecoat plaster for finish plasters, such as:

- Gold Bond® BRAND Gypsum Gauging Plaster
- Gold Bond® BRAND Kal-Kote® Smooth Finish
- Gold Bond® BRAND Kal-Kote® Texture Finish
- Gold Bond® BRAND Uni-Kal®
- Gold Bond® BRAND X-KALibur®

ADVANTAGES

Controlled Uniformity: Two-Way Hardwall Plaster is set-stabilized and adjusted for market requirements and seasonal changes. When mixed with sand or other aggregates, it has uniform working qualities and excellent spread.

Strength: Two-Way Hardwall Plaster properly proportioned with aggregate forms a hard, durable base for the finish coat that provides increased resistance to minor structural movements, impacts and abrasions.

Fire Resistant: Two-Way Hardwall Plaster is essentially mineral in composition and will not support combustion.

RECOMMENDATIONS

Use sand mix plaster for general application and compressive strength.

Use vermiculite plaster for additional fire resistance.

Use perlite mix plaster for lightweight and fire resistance, including columns and beams.

Conventional Plaster Systems

Gold Bond® BRAND Gypsolite® Plaster



TECHNICAL DATA	
Packaging	49.5 lb. (22.5 kg) / Bag
Water Ratio	13-15 qts. / Bag
Gypsum Lath Applications	
– Approx. Coverage per Bag	32 – 35 sq. ft. (3.0 – 3.5 sq. m ²)
– Applied Thickness	7/16" (11.1 mm)
Metal Lath Applications	
– Approx. Coverage per Bag	16 – 19 sq. ft. (1.5 – 1.8 sq. m ²)
– Applied Thickness	9/16" (14.3 mm)*

*Measured from face of lath.

PHYSICAL PROPERTIES		
	Compressive Strength ASTM C472	Tensile Strength ASTM C472
Mill Mix	900 lbf / sq. in. (6,201 kPa)	160 lbf / sq. in. (1,102 kPa)

MORTAR THICKNESS/WEIGHT	
3/8" (9.5 mm)	14 lb. / sq. yd. (8 kg / m ²)
1/2" (12.7 mm)	19 lb. / sq. yd. (10 kg / m ²)
5/8" (15.9 mm)	24 lb. / sq. yd. (13 kg / m ²)
3/4" (19.1 mm)	29 lb. / sq. yd. (16 kg / m ²)

MORTAR WEIGHT	
Dryset Mortar	50 lb. / cu. ft. (801 kg / m ³)
Wet Mortar	69 lb. / cu. ft. (1,105 kg / m ³)

DESCRIPTION

Gold Bond® BRAND Gypsolite® Plaster is a lightweight gypsum basecoat plaster mixed at the plant with correctly sized and proportioned perlite aggregate, requiring only the addition of water on the job. Gypsolite Plaster meets ASTM C28.

Gypsolite Plaster contains no asbestos.

APPLICATIONS

Gypsolite Plaster is designed for interior use in trowel application over gypsum or metal lath as described in ASTM C842.

Gypsolite Plaster is intended to serve as a basecoat plaster for finish plasters, such as:

- Gold Bond® BRAND Gypsum Gauging Plaster
- Gold Bond® BRAND Kal-Kote® Smooth Finish
- Gold Bond® BRAND Kal-Kote® Texture Finish
- Gold Bond® BRAND Uni-Kal®
- Gold Bond® BRAND X-KALibur®

ADVANTAGES

Controlled Uniformity: Gypsolite Plaster assures uniformity through exact proportioning and thorough mixing of graded perlite and gypsum plaster at the mill. Gypsolite provides a uniform base for the finish coat.

Lightweight: Gypsolite Plaster weighs less than half as much as sanded gypsum plaster, thus reducing the dead-load on framing as well as jobsite handling costs.

High Insulating Value: With a "k" factor of 1.5, Gypsolite provides about 3-1/2 times the insulating value of sanded plaster.

Fire Resistant: Gypsolite has excellent fire-resistive qualities and generally provides fire ratings higher than sanded plaster.

LIMITATIONS

Do not use smooth-trowel finish over metal lath, as the combination of a relatively soft (perlite aggregated) basecoat and a hard (smooth-trowel lime/gauging) finish has the potential for cracking and spalling of the finish coat. Instead, specify a sand float finish.

Gold Bond® BRAND Super-White Gauging Plaster



TECHNICAL DATA

Packaging	49.5 lb. (22.5 kg) / Bag
Approx. Coverage*	225 – 315 sq. ft. / Bag (21 – 29 m ² / Bag)

*Based on 1 part plaster to 2 parts hydrated lime.

DESCRIPTION

Gold Bond® BRAND Super-White Gauging Plaster, quick set type or slow set type, is intended for jobsite mixing with hydrated lime. It consists of specially ground, calcined gypsum, which readily mixes with water and hydrated lime.

Proper proportioning is essential, since gauging adds strength and hardness to the finish surface by reinforcing the plastic non-setting lime against shrinkage and cracking.

APPLICATIONS

A finish coat of gypsum gauging plaster and hydrated lime, job mixed 2 parts hydrated lime to 1 part plaster by weight, is intended primarily for interior smooth trowel application over a gypsum plaster basecoat.

Apply smooth finish plasters at a thickness of not more than 1/16 in. (1.6 mm). Texture finishes should be applied at a thickness of not more than 1/8 in. (3.2 mm).

LIMITATIONS

Do not use a smooth-trowel finish over metal lath, as the combination of a relatively soft (perlite aggregated) basecoat and a hard (smooth-trowel lime/gauging) finish has the potential for cracking and spalling of the finish coat. Instead, specify a sand float finish.

Conventional Plaster Systems

Gold Bond® BRAND Super-White Moulding Plaster



DESCRIPTION

Gold Bond® BRAND Super-White Moulding Plaster is a very white, finely ground gypsum, primarily used for all kinds of ornamental plaster work. Because of its low expansion, excellent strength and hardness, it is specially adaptable for casting in rubber, gelatin and other types of moulds. For casting purposes, only water is added. For run-in-place ornamental work, such as cornices, the moulding plaster is used with lime putty, mixed 2 parts lime to 1 part moulding plaster by weight. Complies with ASTM C59.

TECHNICAL DATA

Packaging	49.5 lb. (22.5 kg) / Bag
Water Ratio*	15-18 qts. / Bag

*For casting purposes.

BASECOAT PLASTER APPLICATION

Two-Coat Work

Apply first coat with firm pressure to form a good bond on the Gypsum Plaster Base or masonry base; then immediately double back (without cross-raking first coat) using material of same proportion to build proper basecoat thickness. Straighten to a true surface (without applying water) to receive the second (finish) coat.

Leave surface sufficiently rough and porous to provide suitable bond of the finish coat.

Three-Coat Work

Scratch and brown coats: Used for metal lath or direct masonry bases, and are performed in discrete steps.

Scratch (first) coat: Apply with sufficient material and pressure to obtain good bond over solid bases or form full keys through metal lath. Provide suitable material thickness for scratching (raking) to obtain good mechanical keying of the brown coat.

Brown (second) coat: Apply after the scratch (first) coat has set hard and is still damp. Apply to give mass and surface as for double-back in two-coat work.

FINISH COAT PLASTER APPLICATION

General (Basecoat Condition)

Application over a partially dry basecoat is preferred. If basecoat is thoroughly dry, wet with even application of water to a semi-dry condition. Avoid excess water. Do not apply finish to basecoats having free water on the surface.

Smooth Troweled Finishes

Scratch in tightly over the basecoat, covering the surface completely, then double back immediately with material from the same gauge, filling out to a true, even surface with total thickness of not more than 1/16 in. (1.6 mm).

Allow finish to "draw" (lose moisture to basecoat and ambient air) and firm up – then trowel it well to compact and close the surface under the edge of the trowel. Dash water on the surface for lubrication and development of soft material along trowel's edge to fill surface depressions or other blemishes.

When finish plaster setting action is under way, a second (final) water troweling can be done with strong pressure to obtain a polished surface, if desired.

Texture Finishes

Apply finish as above to a true, even surface with total thickness not more than 1/8 inch (3.2 mm).

Allow finish to "draw" (lose moisture to basecoat and ambient air). Then begin floating, texturing or skip troweling to achieve desired texture. Additions of clean, graded silica may be required to achieve desired texture.

Drying

Allow conventional plaster systems to dry 30 days minimum under ambient conditions prior to final decoration. Variances in humidity or poor drying conditions may affect the drying process.

Painting Plaster

Various job conditions, such as suction differences, wet or only partially dry walls, and reactions between paint and lime, have caused unsatisfactory paint finishes, particularly on new construction.

Alkali-resistant primers specifically formulated for use over new plaster will permit decorating with oil- or latex-type paints.

Quality paint products should be used and paint manufacturer's recommendations followed. Finished plaster should be painted or covered to conceal possible discoloration. The paint system should be suitable for use over plaster surfaces that contain lime, which has a high pH of 10-13.

It is essential that plaster be sound and completely dry before painting. Conventional plaster may require 30 to 60 days to fully dry.

ASTM C28/C28M	<i>Standard Specification for Gypsum Plasters</i>
ASTM C35	<i>Standard Specification for Inorganic Aggregates for Use in Gypsum Plaster</i>
ASTM C59	<i>Standard Specification for Gypsum Casting Plaster and Gypsum Molding Plaster</i>
ASTM C472	<i>Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete</i>
ASTM C516	<i>Standard Specification for Vermiculite Loose Fill Thermal Insulation</i>
ASTM C549	<i>Standard Specification for Perlite Loose Fill Insulation</i>
ASTM C841	<i>Standard Specification for Installation of Interior Lathing and Furring</i>
ASTM C842	<i>Standard Specification for Application of Interior Gypsum Plaster</i>
National Gypsum Company	<i>NGC Construction Guide</i>

Limitations

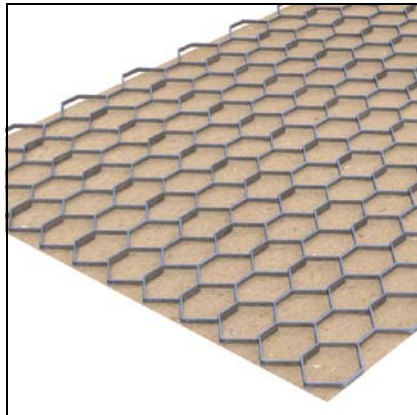
- Not for exterior use.
- Do not use in interior areas where directly exposed to free water or severe moisture conditions.
- Do not use in areas subjected to temperatures exceeding 125°F (52°C) for extended periods.

HANDLING AND PROJECT CONDITIONS

- Avoid water exposure during shipping, handling, storage and installation.
- Keep plaster material dry. Take adequate care while transporting, storing, applying and maintaining plaster. Store products off the ground, under cover and away from moisture sources.
- Maintain a temperature of at least 55°F (13°C) and not more than 80°F (27°C) before, during and after plastering.
- Provide adequate but not excessive ventilation.
- Prevent dryouts by covering heat ducts and window openings where necessary until material has come to a final set.
- Protect adjacent materials from soiling and spattering.

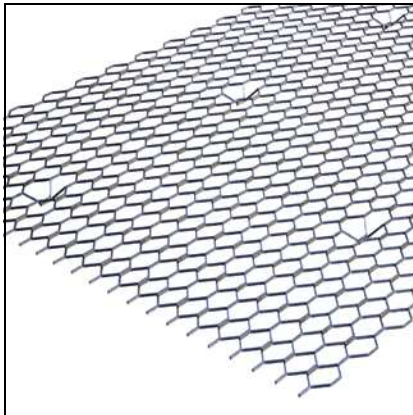
Conventional Plaster Systems

Expanded Metal Lath Types*



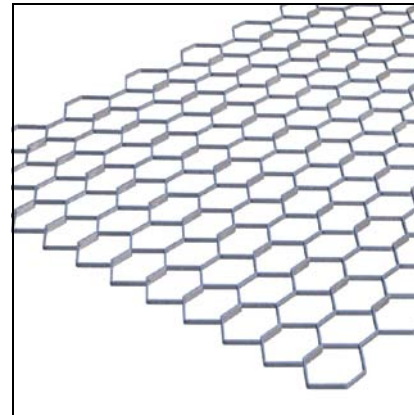
PAPER-BACKED EXPANDED METAL LATH

Available for use where more control over "push-through" or "blow-through" of plaster is desirable.



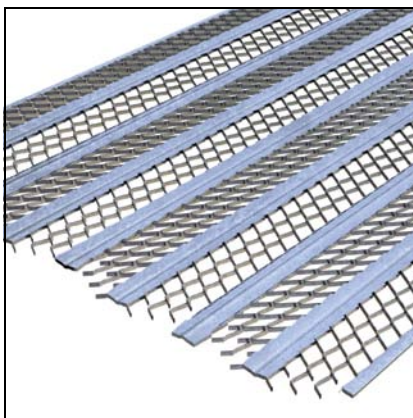
DIAMOND MESH LATH

Use as a plaster base and reinforcement on most types of walls and ceilings, over wood or steel framing, flat or curved surfaces. Diamonds are 5/16 in. (7.9 mm) wide.



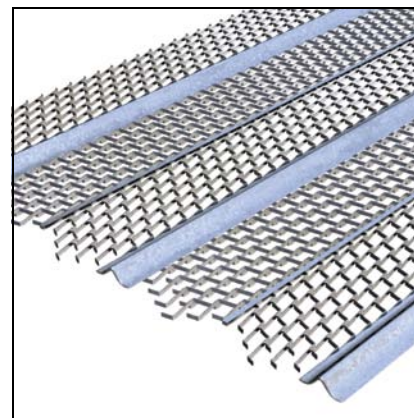
SELF-FURRING DIAMOND MESH LATH

Use in stucco work, as a plaster reinforcement over interior masonry walls, or in steel column fireproofing. The self-furring dimples hold the metal lath 1/4 in. (6.4 mm) away from the plaster substrate.



1/8" FLAT RIB LATH

Use as a plaster base in all types of work where greater rigidity is required, such as reinforcement for basecoat in ceramic tile work. Sheets are reversible.

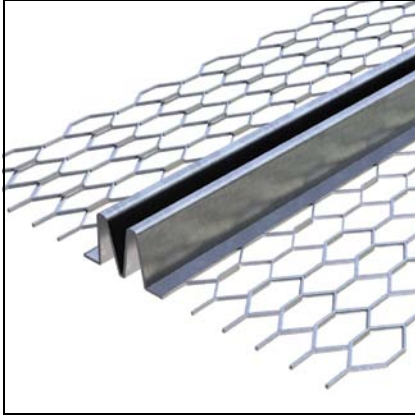


3/8" RIB LATH

Use for ceilings under steel joist construction and metal reinforced concrete floors. Also recommended for ceilings under concrete slab floors over steel joists.

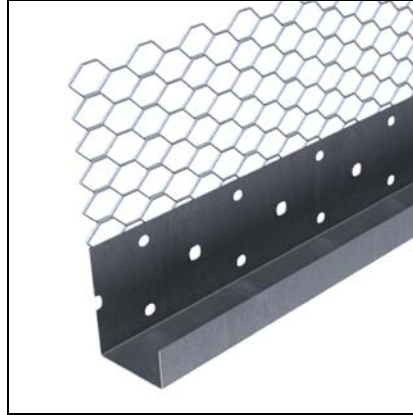
*Metal products are not manufactured by National Gypsum Company.

Conventional Plaster Accessories*



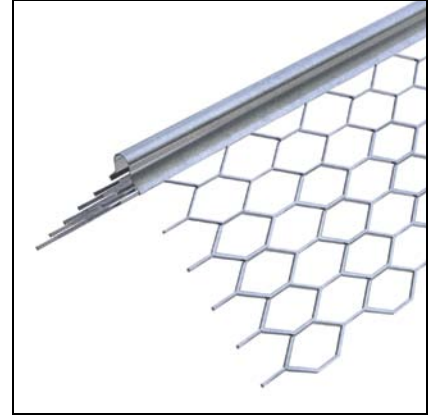
DOUBLE V EXPANSION JOINT

Minimizes cracking in large plaster areas. Also provides ground to ensure proper plaster thickness.



EXPANDED FLANGE SQUARE CASING

Has short, 90-degree return at plaster surface, serving as a plastering stop.



EXPANDED CORNERBEAD

The 2-1/2 in. (63.6 mm) expanded flange ends 1/4 in. (6.4 mm) from the nose of the bead, providing reinforcement where needed most.



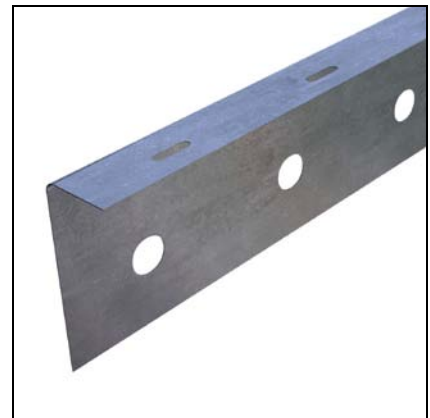
COLD-ROLLED STEEL CHANNEL

Used as studs for attaching metal lath in 2 in. (50.8 mm) solid partitions. For furring or runners in suspended ceilings.



BEAM FURRING CLIP

Used to attach lath to flanges of steel beams, joists and columns. Tempered spring steel.



L RUNNER

Perforated – Ceiling or floor support for 2 in. (50.8 mm) solid lath and plaster partition.

Plain – Ceiling support for 2 in. (50.8 mm) solid board partition using 1 in. (25.4 mm) shaftliner.

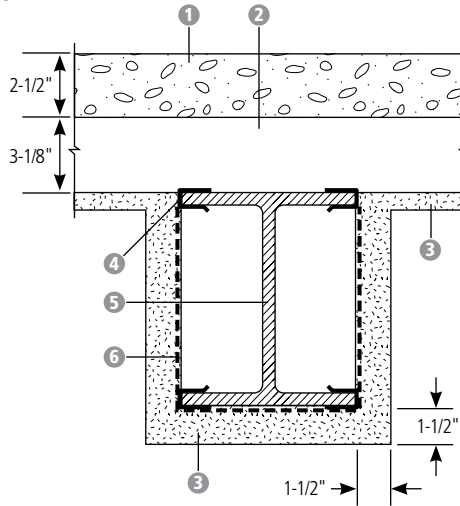
*Metal products are not manufactured by National Gypsum Company.

Conventional Plaster System Details

Fire-Proof Columns And Beams With Metal Lath

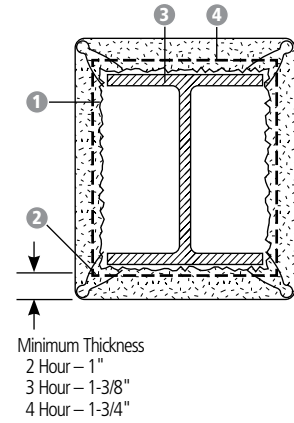
BEAM – 3-HOUR

1. Concrete
2. Steel Deck
3. Plaster
4. Beam Furring Clips
5. Steel Beam
6. 3.4 lb. Diamond Mesh Metal Lath



COLUMN – UL X402

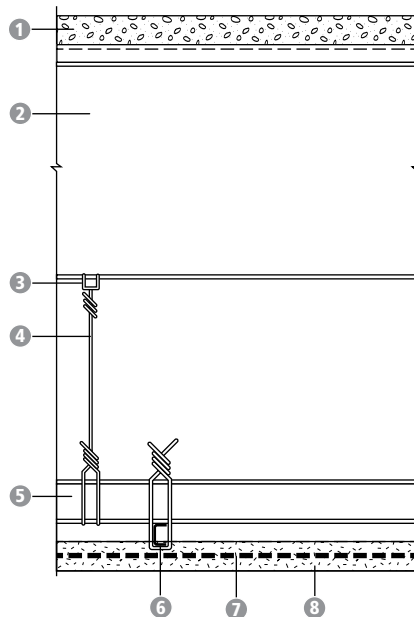
1. 3.4 lb. Diamond Mesh Metal Lath
2. Steel Cornerbead
3. Steel Column
4. Gypsum Perlite Plaster



Suspended Metal Lath Details

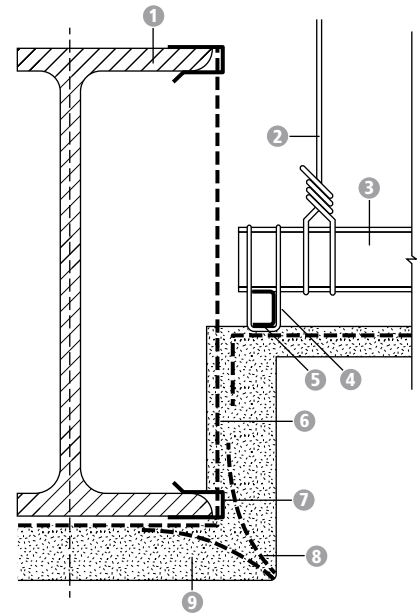
SUSPENDED METAL LATH CEILING

1. Concrete Floor
2. Steel Joist
3. Hanger Clip
4. Hanger Wire
5. 1-1/2\" C.R. Channel
6. 3/4\" C.R. Channel
7. Metal Lath
8. Plaster



BEAM PROTECTION

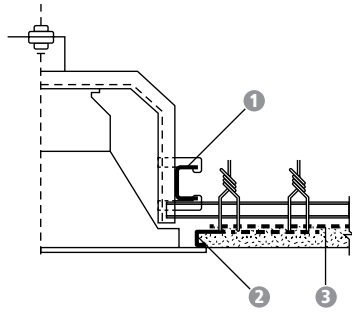
1. Steel Beam
2. Hanger Wire
3. 1-1/2\" C.R. Channel
4. Tie Wire
5. 3/4\" C.R. Channel
6. Metal Lath
7. Beam Furring Clips No. 11 W and M-Gauge Spring Steel
8. Expanded Corner Bead
9. Gypsum Plaster



Suspended Metal Lath Details

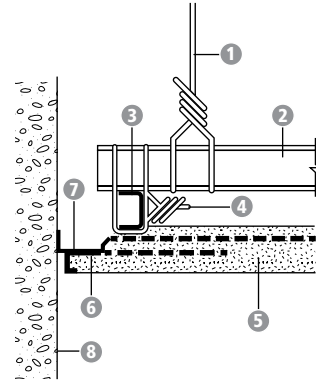
LIGHTING TROFFER

1. 1-1/2" C.R. Channel
2. Casing Bead
3. Metal Lath



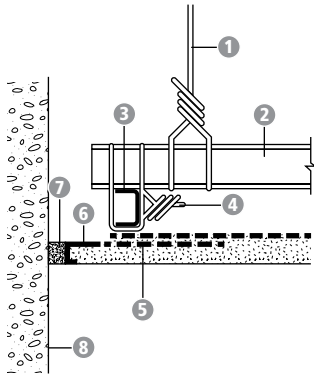
SUSPENDED METAL LATH AT WALL – UNRESTRAINED

1. Hanger Wire
2. 1-1/2" C.R. Channel
3. 3/4" C.R. Channel
4. Tie Wire
5. Gypsum Plaster
6. Casing Bead
7. Flexible Dust Seal
8. Finished Wall Line



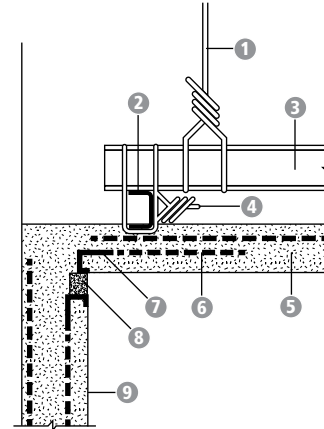
SUSPENDED METAL LATH AT WALL – UNRESTRAINED

1. Hanger Wire
2. 1-1/2" C.R. Channel
3. 3/4" C.R. Channel
4. Tie Wire
5. Metal Lath
6. Casing Bead
7. Caulk
8. Finished Wall Line



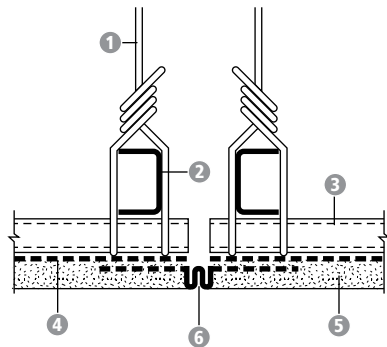
SUSPENDED METAL LATH AT WALL – RESTRAINED

1. Hanger Wire
2. 3/4" C.R. Channel
3. 1-1/2" C.R. Channel
4. Tie Wire
5. Gypsum Plaster
6. Metal Lath
7. Casing Bead
8. Caulk
9. Finished Wall Line



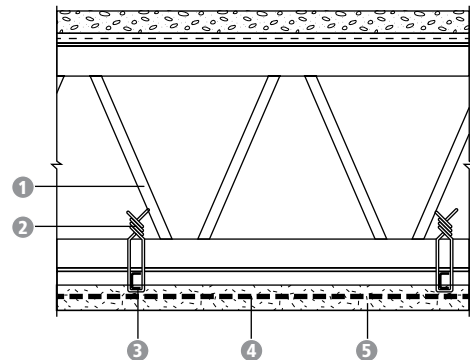
SUSPENDED METAL LATH CONTROL JOINT

1. Hanger Wire
2. 1-1/2" C.R. Channel
3. 3/4" C.R. Channel
4. Metal Lath
5. Gypsum Plaster
6. Expansion Joint



FURRED METAL LATH CEILING

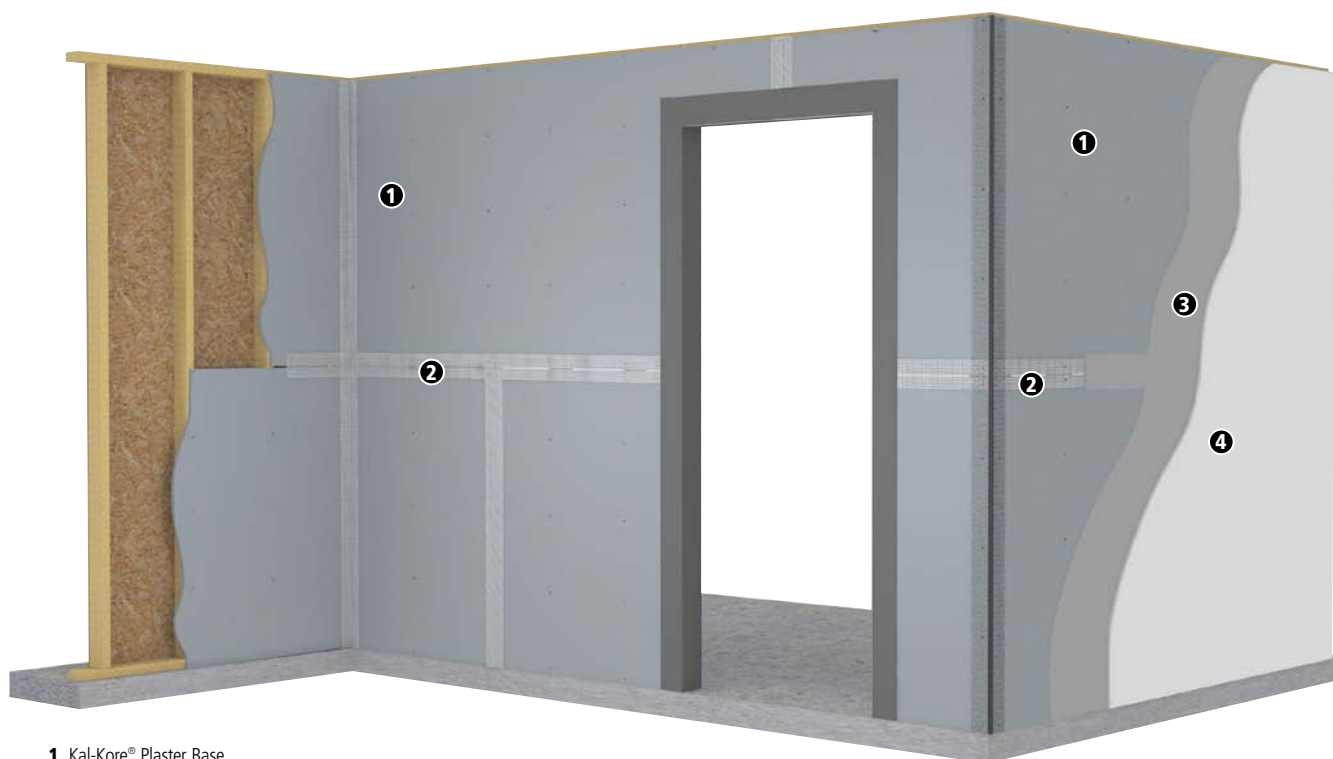
1. Bar Joist
2. Tie Wire
3. 3/4" C.R. Channel
4. Metal Lath
5. Gypsum Plaster



Veneer Plaster

Systems

Veneer Plaster Systems are a contemporary, integrated application providing smooth, high-quality wall surfaces for both residential and commercial applications. They feature ease and speed of installation along with uniform performance and quality. Veneer plaster systems utilize thinly troweled, special-purpose plasters applied to Kal-Kore® Plaster Base or applied directly to bonded masonry or bonded concrete substrates.



1. Kal-Kore® Plaster Base
2. Kal-Mesh® Joint Tape
3. Kal-Kote® Basecoat
4. Kal-Kote® Smooth Finish
or Kal-Kote® Texture Finish



Basic Uses

APPLICATIONS

Use for virtually all types of partition and ceiling construction, including wood or steel framing and furring and masonry, for both residential and commercial buildings.

VENEER PLASTER SYSTEM ADVANTAGES

- Provides high resistance to cracking, impact and abrasion failure.
- Enhances overall wall strength and abrasion resistance.
- Provides an excellent base over which paints or other finishes should be applied.
- Provides faster installation than conventional plaster systems, which reduces overall construction time.
- Mill-mixed plaster components help assure uniform installation performance and quality.
- Applications in multiple fire-rated assemblies, including column fireproofing.

Installation Recommendations

GENERAL

- A top-quality veneer plastering job requires not only top-grade plaster products but also careful planning, handling and storage of material. Plumb and true framing and properly installed plaster bases are equally vital. Examine the framing and bases carefully before proceeding with work.
- Install plaster base, veneer plaster and accessories consistent with methods described in the noted standards, including ASTM C843 and ASTM C844, additional references listed in this document, and as indicated below.
- Veneer Plaster Systems are to be installed with maximum deflection criteria of L/240.
- Gypsum panel product joints shall be located so that no joint will occur within 12 in. (305 mm) of the corner of a window or door opening unless control joints are to be installed at these locations.
- Apply bonding agent to non-plaster base gypsum board, monolithic concrete, Portland cement plaster and to stable, existing gypsum plaster surfaces prior to application of veneer plaster systems.
- Bring plaster to a true level surface without the application of additional water.
- Tolerances: For flatness of surface, do not exceed 1/8 in. (3.2 mm) in 10 ft. (3,048 mm) for bow or warp of surface and for plumb and level.
- National Gypsum veneer plaster products are formulated for hand use.
- Do not retemper plaster mix.
- Keep tools and mixing equipment clean.
- Veneer Plasters provide a working time of approximately one hour. Mix only the quantity of plaster which can be applied and finished within one hour.

Gold Bond® BRAND Uni-Kal® Veneer Plaster



DESCRIPTION

Gold Bond® BRAND Uni-Kal® Smooth Finish Veneer Plaster is a mill-mixed veneer finish plaster for smooth and textured troweled applications. It consists of specially ground, calcined gypsum, requiring the addition of water. Texturing grade silica sand may be added for textured finish. Complies with ASTM C587.

APPLICATIONS

Use as a single-coat application over gypsum plaster base. A finish coat of Uni-Kal® Veneer Plaster may be used for interior smooth and textured trowel application over a gypsum plaster basecoat or as a single-coat application over gypsum plaster base.

TECHNICAL DATA

Packaging	49.5 lb. (22.5 kg) / Bag
Water Ratio	13 – 15 qts. / Bag
PSI	1,400
Approx. Coverage per Bag – Applied Thickness	135 – 150 sq. ft. (12 – 14 m ²) 3/32" (2.4 mm)
One Coat to Level Over Masonry	70 – 80 sq. ft. (6.5 – 7.5 m ²)

Gold Bond® BRAND X-KALibur® Veneer Plaster



DESCRIPTION

Gold Bond® BRAND X-KALibur® Extended Set Veneer Plaster is a mill-mixed veneer finish plaster for smooth troweled applications where an extended setting time is desirable. It consists of specially ground, calcined gypsum, requiring the addition of water. Texturing grade silica sand may be added for textured finish. Complies with ASTM C587.

APPLICATIONS

Use as a single-coat application over gypsum plaster base. A finish coat of X-KALibur may be used for interior smooth and textured trowel application over a gypsum plaster basecoat.

TECHNICAL DATA

Packaging	49.5 lb. (22.5 kg) / Bag
Water Ratio	13 – 15 qts. / Bag
PSI	1,400
Approx. Coverage per Bag – Applied Thickness	135 – 150 sq. ft. (12 – 14 m ²) 3/32" (2.4 mm)
One Coat to Level Over Masonry	70 – 80 sq. ft. (6.5 – 7.5 m ²)

Veneer Plaster systems

Gold Bond® BRAND Kal-Kote® Basecoat Veneer Plaster



DESCRIPTION

Gold Bond® BRAND Kal-Kote® Basecoat Plaster is a specially designed high-strength basecoat plaster for application 1/16 in. (1.6 mm) minimum thickness over Kal-Kore® Plaster Base, masonry or monolithic concrete that has been treated with a bonding agent. Strength of Kal-Kote® Basecoat is substantially greater than that exhibited by typical sanded basecoat plaster.

APPLICATIONS

Veneer Plaster two-coat systems may be specified for virtually all types of partition and ceiling constructions, including wood or steel framing, or furring and masonry. For both residential and commercial buildings, either type of veneer plaster system produces a wall surface that is resistant to nail pops.

Kal-Kote Basecoat is a high strength basecoat plaster for application over Kal-Kore. This system offers four finish options: Kal-Kote® Smooth, Kal-Kote® Texture, Uni-Kal® and X-KALibur®.

TECHNICAL DATA

Packaging	49.5 lb. (22.5 kg) / Bag
Water Ratio	6 – 8 qts. / Bag
PSI	2,500
Approx. Coverage per Bag – Applied Thickness	93 – 106 sq. ft. (8.6 – 9.8 m ²) 1/16" (1.6 mm)
One Coat to Level Over Masonry	50 – 63 sq. ft. (4.6 – 5.8 sm ²)

Gold Bond® BRAND Kal-Kote® Smooth Finish Plaster



DESCRIPTION

Gold Bond® BRAND Kal-Kote® Smooth Finish Plaster is a mill-mixed finish plaster for two-coat smooth-troweled applications. It consists of specially ground, calcined gypsum, requiring the addition of water. Complies with ASTM C587.

APPLICATIONS

A finish coat of Kal-Kote® Smooth Finish Plaster is intended for interior smooth trowel application over a gypsum plaster basecoat.

Apply smooth finish plasters at a thickness of not more than 1/16 in. (1.6 mm).

TECHNICAL DATA

Packaging	49.5 lb. (22.5 kg) / Bag
Water Ratio	18 – 20 qts. / Bag
PSI	1,000
Approx. Coverage per Bag – Applied Thickness	145 – 160 sq. ft. (13 – 15 m ²) 1/16" (1.6 mm)

Veneer Plaster Systems

**Gold Bond® BRAND
Kal-Kote® Texture Finish Plaster**



DESCRIPTION

Gold Bond® BRAND Kal-Kote® Texture Finish Plaster is a mill-mixed finish plaster for textured applications. It consists of specially ground, calcined gypsum and aggregate, requiring the addition of water. Complies with ASTM C587.

APPLICATIONS

A finish coat of Kal-Kote Smooth Finish Plaster is intended for interior textured application over a gypsum plaster basecoat in a two-coat system.

Apply smooth finish plasters at a thickness of not more than 1/16 in. (1.6 mm).

TECHNICAL DATA	
Bag Weight	49.5 lb. (22.5 kg) / Bag
Water Ratio	11 – 12 qts. / Bag
PSI	1,000
Approx. Coverage per Bag – Applied Thickness	145 – 160 sq. ft. (13 – 15 m ²) 1/16" (1.6 mm)

- Set times will be affected by jobsite conditions, such as minerals in the water, cleanliness of the tools and by the addition of various materials used to adjust the working characteristics of the plaster. National Gypsum only recommends commercial accelerators or retarders manufactured for those specific purposes.
- Veneer Plasters are designed for trowel application and are not suitable for conveyance or application by conventional plastering machines.

TREATMENT OF KAL-KORE® JOINTS FOR VENEER PLASTER SYSTEMS

Pre-treat all joints and fasteners in Kal-Kote® and Uni-Kal® Plaster Systems with Kal-Kote® Basecoat Plaster, Uni-Kal®, X-KALibur® or Quick Set™ Joint Compound. Low humidity, high temperatures and rapidly circulating air can cause cracking of plaster and joint beading when Kal-Kore® is applied to metal framing. To minimize this during these conditions, joints may be pre-treated using paper tape.

Three acceptable methods of treating Kal-Kore joints are:

Drywall Paper Tape Treatment Method

1. Trowel Kal-Kote Basecoat Plaster, Uni-Kal or X-KALibur over joint line filling the channel formed by the tapered edges of the Kal-Kore Board in an even fashion.
2. Center drywall paper tape over the joint line and embed the tape into the soft plaster using a trowel and level the joint. Tape the full length of the joint.
3. Allow the treated joints to set prior to general plaster application.

ProForm® BRAND Quick Set™ Compound and Paper Tape Treatment Method

1. Mix Quick Set™ Compound per instructions on package. Do not contaminate the compound with other materials, dirty water or previous mixes. Do not retemper.
2. Apply the Quick Set Compound to the joint by hand or machine tool. The drywall paper tape must be centered over the joint line and embedded into the soft compound. Do not over-trowel to a slick surface. Leave the surface rough to provide mechanical keying of the plaster.
3. Allow the treated joints to set and dry prior to general plastering.

Mesh Treatment Method

Do not use self-adhering mesh.

1. Center and secure mesh over all joints and interior angles with 1/4 in. (6.4 mm) or 5/16 in. (7.9 mm) staples.
2. Position staples a maximum of 24 in. (610 mm) apart as follows:
 - A. Joints: at alternate edges for the run from end-to-end and directly opposite one another at either end.
 - B. Angles: along ceiling edge only for wall-to-ceiling angles. Along one edge for wall-to-wall angles.
3. After the first staples are placed at the end of a joint or angle, pull unstapled mesh as stapling proceeds to assure that it will lie flat against the Kal-Kore.
4. Pre-treat all joints and beads with Kal-Kote, Uni-Kal or X-KALibur Plaster. Tightly trowel over joint line in both directions to prevent voids, feathering to a maximum width of about 6 in. (152 mm).
5. Allow the treated joints to set prior to general plaster application.

APPLICATION OF VENEER PLASTER OVER KAL-KORE PLASTER BASE

Kal-Kote Application Over Kal-Kore

Basecoat Over Kal-Kore

1. Tightly scratch material into previously treated joints and cornerbeads, then immediately scratch-in tightly over the wall and/or ceiling area.
2. Double back over the area just troweled with material from the same batch, bringing total thickness up to 1/16 in. (1.6 mm) minimum.
3. When plaster has "taken up," eliminate excessive trowel marks and fill all surface voids and imperfections to obtain a reasonably uniform surface. Do not over-trowel to a slick surface. Roughen the unset basecoat plaster surface with a serrated darby or lightly wire rake to provide mechanical keying for the finish plaster when necessary.

Smooth Finish Over Basecoat

1. Apply only over properly prepared Kal-Kote® Basecoat. Scratch-in tightly, then double back with material from the same batch immediately to create a uniform coat not exceeding 1/16 in. (1.6 mm) in average thickness.
2. Remove trowel marks, "cat faces" and other major surface imperfections by "drawing up" or "laying down" the surface with light trowel pressure when plaster has stiffened. Use water sparingly if needed, but do not over-trowel or over-water because this aggravates any normal tendency for blistering when working over such low suction bases. Such blistering will be eliminated by the final water troweling operations.
3. Water-trowel to densify and polish the surface to the desired degree when plaster has set, eliminating any blistering if present.
4. Uni-Kal® and X-KALibur® Plaster may be substituted for Kal-Kote® Smooth Finish.

Texture Finish Over Basecoat

1. Apply only over properly prepared Kal-Kote Basecoat. Scratch-in tightly, then double back with material from the same batch immediately to create a uniform coat not exceeding 1/16 in. (1.6 mm) in average thickness.
2. When plaster has stiffened, float its surface to the desired finish. Do not float the surface of plaster, which has already set. For texturing with Uni-Kal and X-KALibur, add up to equal parts of clean, graded silica sand.

UNI-KAL® OR X-KALIBUR® APPLICATION OVER KAL-KOTE®

1. Tightly scratch material into previously treated joints and cornerbeads, then immediately scratch-in tightly over the wall and/or ceiling area.
2. Double back over area just troweled with material from the same batch, bringing total thickness up to 3/32" (2.4 mm) maximum.
3. Begin finish troweling at time of initial set, using water sparingly. Final troweling must be accomplished before final set takes place, as evidenced by darkening of the surface.

Drying

Allow veneer plaster systems to dry 48 hours minimum under ambient conditions prior to final decoration. Variances in humidity or poor drying conditions may affect the drying process.

Painting Plaster

The veneer plaster should not be considered a finished product. Various job conditions, such as suction differences, wet or only partially dry walls, and reactions between paint and lime, have caused unsatisfactory paint finishes, particularly on new construction.

Alkali-resistant primers specifically formulated for use over new plaster will permit decorating with oil- or latex-type paints.

Quality paint products should be used and paint manufacturers' recommendations followed. Finished plaster should be painted or covered to conceal possible discoloration. The paint system should be suitable for use over plaster surfaces that contain lime, which has a high pH of 10-13.

It is essential that plaster be stable and completely dry before painting. Under good drying conditions, veneer plaster may be painted 48 hours after application.

High build, heavy duty and special purpose coatings, such as epoxy, are not recommended over veneer or job-gauged lime putty finishes. In all cases, the paint manufacturer should be consulted and approve the paint system suitability for use with gypsum/lime finish plaster.

ASTM C28/C28M	Standard Specification for Gypsum Plasters
ASTM C35	Standard Specification for Inorganic Aggregates for Use in Gypsum Plaster
ASTM C59	Standard Specification for Gypsum Casting Plaster and Gypsum Molding Plaster
ASTM C472	Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete
ASTM C516	Standard Specification for Vermiculite Loose Fill Thermal Insulation
ASTM C549	Standard Specification for Perlite Loose Fill Insulation
ASTM C587	Standard Specification for Gypsum Veneer Plaster
ASTM C843	Standard Specification for Application of Gypsum Veneer Plaster
ASTM C844	Standard Specification for Application of Gypsum Base to Receive Gypsum Veneer Plaster
National Gypsum Company	NGC Construction Guide

Veneer Plaster Systems

MIXING

Equipment: Mixing should be done with a high-speed mechanical mixer. A paddle-type agitator fitted to a 500-600 RPM heavy duty, 1/2 in. electric drill and a clean, smooth-sided drum of convenient size are recommended for rapid, efficient mixing of all Kal-Kote® Plaster types.

Water Ratios: Use only clean, fresh water suitable for human consumption. Basecoat: 10-12 qts. per 80 lb. bag. Smooth Finish: 18-20 qts. per 50 lb. bag. Texture Finish: 11-12 qts. per 50 lb. bag. Uni-Kal® and X-KALibur®: 13-15 qts. per 50 lb. bag.

PROCEDURE

1. Put all but 1 to 2 qts. of the proper water volume in a suitable mixing drum.

Note: Starting with an insufficient amount of mixing water will seriously degrade mixing and application performance.

2. Add plaster and allow to soak for about 1 minute or add plaster as mixer is turning, then mix until uniformly wetted.
3. Add remaining water and mix sufficiently to obtain desired lump-free material fluidity.

Note:

- A. Mixing periods greater than 5 minutes will not be required if proper equipment and procedure are used.
- B. Mix no more than two bags per batch to avoid mixing too far in advance of application.
- C. Caution is advised against mixing more than two successive batches without thorough equipment clean-up to avoid undue set acceleration.
- D. Avoid the practice of mixing partial bags since this leads to difficulty in maintaining uniform material qualities.

VENEER PLASTERS DIRECT TO BOND-COATED MONOLITHIC CONCRETE

DESCRIPTION

The Kal-Kote System, consisting of a basecoat plaster and a finish coat plaster, Uni-Kal or X-KALibur may be applied directly to monolithic concrete treated with a bonding agent.

LIMITATIONS

1. Surface to be plastered shall be treated with a bonding agent applied according to manufacturer's directions. The performance of this system is the sole responsibility of the bonding agent manufacturer.
2. Concrete should be aged at least one month prior to plastering.
3. Kal-Kote Smooth or Texture Finishes are not designed for direct application to concrete, but must first have Kal-Kote Base Plaster applied to fill and level surface.
4. Do not apply system to the interior side of exterior walls below grade. To use above grade, these walls shall be kept dry and shall have been properly waterproofed on the exterior side to prevent water penetration.

APPLICATION PROCEDURES

Note: Application shall conform to ASTM C843.

Kal-Kote Base Application Over Bonding Agent

1. First straighten any major surface irregularities, such as holes, ridges and wavy sections. Scratch plaster in tightly by trowel and fill out to any adjacent level area.
2. After the straightening material has set, trowel in a tight scratch coat over the entire area to be plastered; then immediately double back with material from the same batch to minimum thickness of 1/16 in. (1.6 mm) or as required to achieve a level surface. Use a rod or feather edge if needed.
3. When plaster has "taken up," eliminate excessive trowel marks and fill all surface voids and imperfections to obtain a reasonably uniform surface. Do not trowel to a slick surface. Roughen the unset basecoat plaster surface with a serrated darby or lightly wire rake to provide mechanical keying for the finish plaster when necessary.

Smooth or Textured Finishes

Apply finishes to the Kal-Kote® Plaster as outlined under the regular Kal-Kote System as described on page 153.

Uni-Kal® or X-KALibur® Application Over Bonding Agent

1. First straighten any major surface irregularities such as holes, ridges and wavy sections. Scratch plaster in tightly by trowel and fill out to any adjacent level area.
2. Allow the straightening material to set.
3. Tightly scratch material in over the wall and/or ceiling area. This application should be about 1/16 in. (1.6 mm) thick. Double back over the area just troweled with material from the same batch, bringing total thickness up to 3/32 in. (2.4 mm) minimum.
4. Begin finish troweling at time of initial set, using water sparingly. Final troweling must be accomplished before complete set takes place, as evidenced by darkening of the surface.

Limitations

- Not for exterior use.
- Do not use in interior areas where directly exposed to free water or severe moisture conditions.
- Do not use in areas subjected to temperatures exceeding 125°F (52°C) for extended periods.

FIRE RESISTANCE

Kal-Kote® Basecoat and Finishes: Fire ratings equivalent to those of drywall systems can be obtained by applying the corresponding Kal-Kore® type and thickness over the same framing member size and spacing, with the same fasteners and 1/8 in. (3.2 mm) of Kal-Kote plasters.

Gold Bond® BRAND Uni-Kal®: Fire ratings equivalent to those of drywall systems can be obtained by applying the corresponding Kal-Kore type and thickness over the same framing member size and spacing with the same fasteners and 3/32 in. (2.4 mm) of Uni-Kal®.

Gold Bond® BRAND X-KALibur®: Fire ratings equivalent to those of drywall systems can be obtained by applying the corresponding Kal-Kore type and thickness over the same framing member size and spacing with the same fasteners and 3/32 in. (2.4 mm) of X-KALibur.

HANDLING AND PROJECT CONDITIONS

- Avoid water exposure during shipping, handling, storage and installation.
- Keep plaster material dry. Take adequate care while transporting, storing, applying and maintaining plaster. Store products off the ground, under cover and away from moisture sources.
- Maintain a temperature of at least 55°F (13°C) and not more than 80°F (27°C) before, during and after plastering.
- Provide adequate but not excessive ventilation.
- Avoid exposure to direct sunlight prior to installation and application.
- Prevent dryouts by covering heat ducts and window openings where necessary until material has come to a final set.
- Protect adjacent materials from soiling and spattering.

Accessories

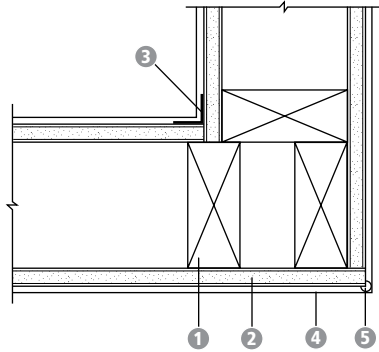
Veneer Plaster System Accessories*: The following accessories are commonly utilized in conjunction with Veneer Plaster Systems:

- **Mesh:** A coated fiberglass tape stapled to Kal-Kore Plaster Base to reinforce joints and interior angles.
- **ProForm® BRAND Paper Tape:** Designed for use with ready mix or setting-type joint compounds and gypsum veneer plaster systems to conceal and reinforce joints.
- **Veneer Cornerbead:** A special galvanized bead with a 1/8 in. (3.2 mm) ground and 1-1/4 in. (31.8 mm) flanges used to reinforce exterior corners.
- **Expanded Veneer Cornerbead:** Used as an alternative to the veneer cornerbead for exterior corners. Galvanized steel with 1-1/8 in. (28.6 mm) flanges.
- **Veneer L Trim Casing Bead:** Used as a finished edge at door and window jambs; galvanized steel.
- **Veneer J Trim Casing Bead:** Used as a finished edge at door and window jambs by slipping over edge of plaster base; galvanized steel.
- **E-Z Strip Control Joint:** An extruded vinyl control joint to relieve stresses in Veneer Plaster Systems.
- **.093 Zinc Control Joint:** All-zinc control joint designed to relieve stresses in Veneer Plaster Systems.

*Metal products are not manufactured by National Gypsum Company.

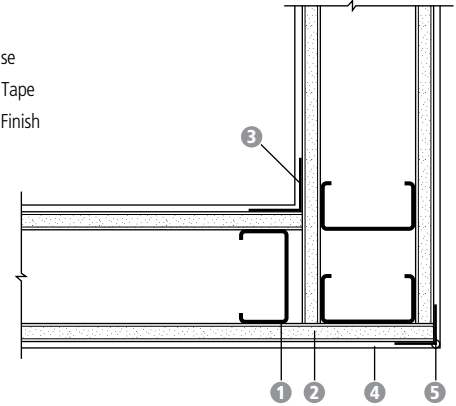
CORNER – WOOD STUDS DETAIL

1. Wood Studs
2. Kal-Kore Plaster Base
3. Kal-Mesh or Paper Tape
4. Kal-Kote Base and Finish
5. Cornerbead



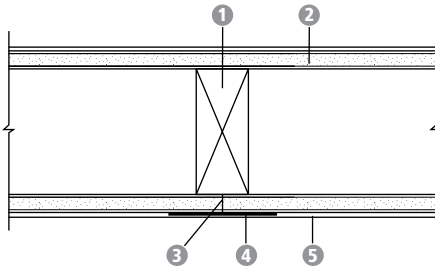
CORNER – STEEL STUDS DETAIL

1. Steel Studs
2. Kal-Kore Plaster Base
3. Kal-Mesh or Paper Tape
4. Kal-Kote Base and Finish
5. Cornerbead



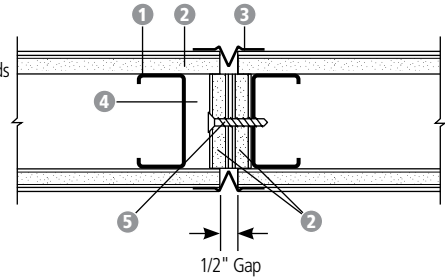
JOINT DETAIL

1. Wood Stud
2. Kal-Kore Plaster Base
3. Kal-Kore Joint
4. Kal-Mesh or Paper Tape
5. Kal-Kote Base and Finish



1-HOUR FIRE-RATED CONTROL JOINT DETAIL*

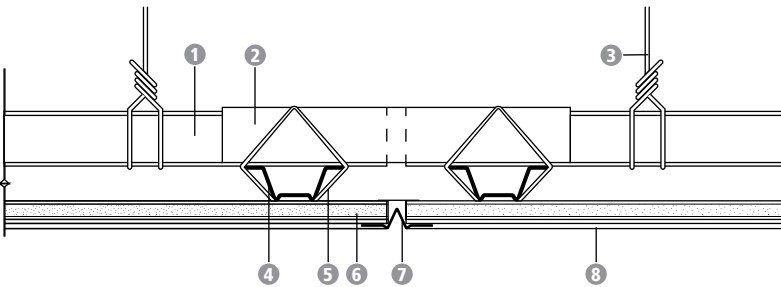
1. 2-1/2" Min. Steel Studs
2. 5/8" Fire-Shield Kal-Kore Plaster Base
3. Control Joint
4. 5/8" Gap
5. 1-5/8" Type S Screws 24" o.c.



* Based on Warnock-Hersey Report No. WH-651-0318.1 and Factory Mutual Design No. W1B-1 hr.

SUSPENDED VENEER PLASTER CONTROL JOINT

1. 1-1/2" C.R. Channel
2. 1-1/2" C.R. Channel Piece 16" Long-Nested (Two Tie Wires each side)
3. Hanger Wire
4. Furring Channel
5. Tie Wire
6. Kal-Kore Plaster Base
7. Control Joint
8. Kal-Kote Base and Finish



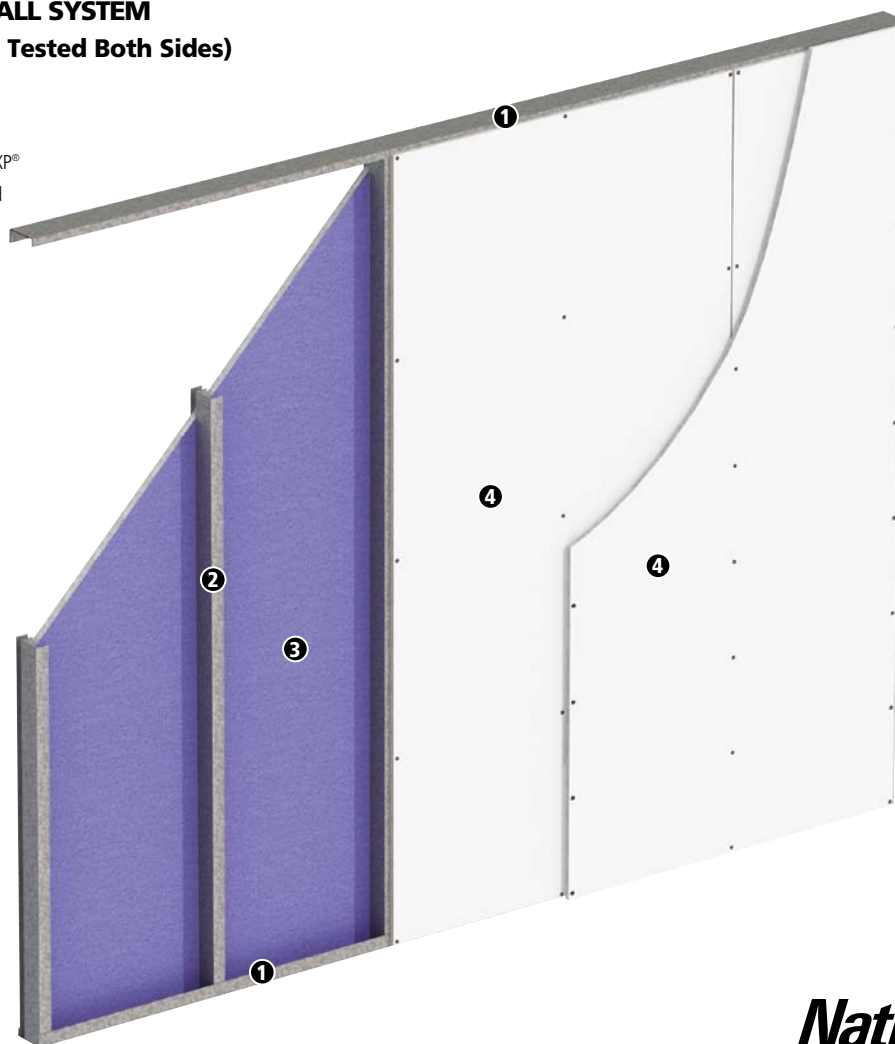
Cavity Shaftwall Systems

Cavity shaftwall systems are non-load-bearing, 1-hour to 4-hour, fire-rated partitions constructed from one side used to enclose elevator shafts, stairs and mechanical shafts where the design requires resistance to both fire and air pressure. Cavity shaftwall systems can also be used as fire-rated, interior partitions where access is restricted to one side and as fire-rated, horizontal membranes.

Cavity Shaftwall Systems

CAVITY SHAFTWALL SYSTEM U497 2-Hour (Fire Tested Both Sides)

1. J-Track
2. C-T, C-H or I-Stud
3. 1" Fire-Shield® Shaftliner XP®
4. Fire-Shield® Gypsum Board



Cavity Shaftwall Systems Installation

Description

The cavity shaftwall system consists of steel C-T, C-H or I-Studs and J-Tracks with 1 in. (25.4 mm) shaftliner panels friction fit between the studs. Single or multiple layers of Gold Bond® BRAND Fire-Shield® Gypsum Board are applied to the face of the studs to complete the fire-rated assembly. Shaft enclosures can be framed with C-T, C-H or I-Studs with integral tabs and flanges that hold the panels in place and J-Track for runners at top, bottom, as well as vertically at partition ends and to frame openings.

National Gypsum Company produces three shaftliner products:

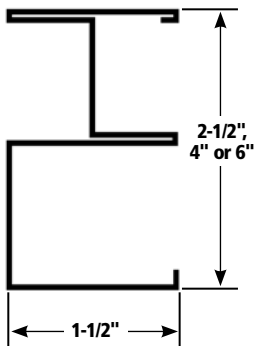
Gold Bond® BRAND Fire-Shield® Shaftliner consists of a fire-resistant gypsum core encased in a heavy, moisture-resistant and green paper that is made from 100-percent recycled content.

Gold Bond® BRAND XP® Shaftliner consists of a mold-, mildew-, moisture- and fire-resistant gypsum core with a specially designed PURPLE® paper that offers superior resistance to mold and mildew.

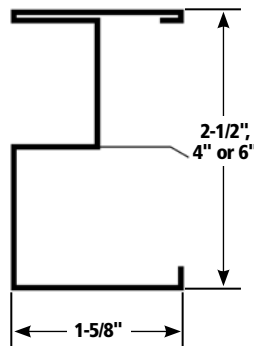
Gold Bond® BRAND EXP® Shaftliner consists of a fire-resistant gypsum core encased in a coated, specially designed PURPLE® fiberglass mat facer for superior mold, mildew and moisture resistance.

The double-beveled edge configurations for all three products allow for simple installation into the C-T, C-H or I-Studs.

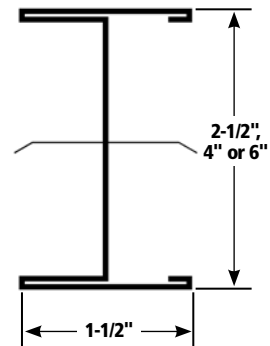
C-H STUD



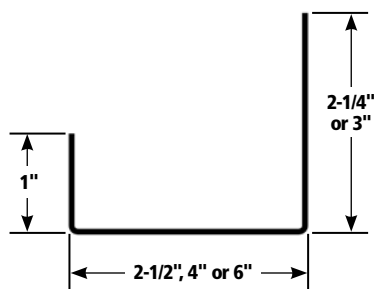
C-T STUD



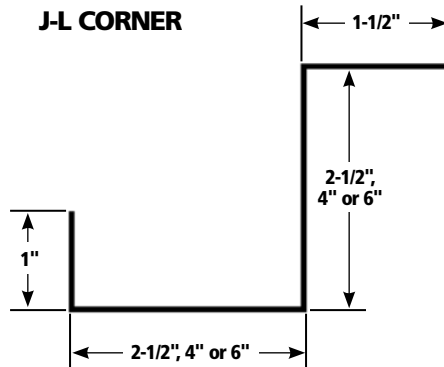
I-STUD



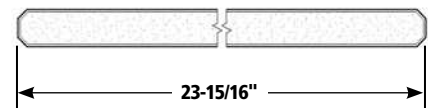
J-TRACK



J-L CORNER



SHAFTLINER



Cavity shaftwall systems are the preferred method for the construction of shaft enclosures. In fact, it is now more common than traditional masonry shafts. The advantages of shaftwall include:

Lightweight. Masonry shaftwalls weigh 20 to 45 lbs. per square ft. (98 to 220 kg/m²). By contrast, gypsum shaftwall assemblies weigh in at a remarkably low 10 to 13 lbs. per square ft. (49 to 63 kg/m²).

Easy Installation. Shafts can be quickly enclosed with steel framing, and the Shaftliner panels can be installed from outside the shaft. This means the contractor need not erect scaffolding.

Weather Resistance. Shaftliner panels can be installed under conditions that would halt masonry work, including temperatures that are too cold for Portland cement mortar. For protection against wet weather during installation, 1 in. (25.4 mm) Shaftliner is encased in light green, moisture-resistant paper. XP® Shaftliner is encased in a specially designed PURPLE® paper with superior mold, mildew and moisture resistance. These systems are not designed for long-term moisture exposure. Refer to limitations on page 196.

EXP® Shaftliner is encased in a specially designed PURPLE® fiberglass mat with superior mold, mildew and moisture resistance and backed by a 12-month exposure warranty.

Sound And Fire Resistance. Cavity shaftwall systems provide excellent sound control and can achieve the fire ratings from one through four hours. For a full list of acoustical and fire-resistant assemblies, refer to pages 32-62.

Cost Savings. Best of all, cavity shaftwall systems are more economical than masonry shaft construction.

Technical Data

Cavity Shaftwall Systems have non-bearing wall ratings of one hour through four hours and are listed in the *UL Fire Resistance Directory* as design Nos. U428, U429, U497, U498, U499 and W419 and in the GA-600 Fire Resistance Manual as file numbers WP 6904, WP 6905, WP 7051, WP 7060, WP 7061, WP 7062, WP 7064, WP 7065.2, WP 7076, WP 7077, WP 7079, WP 7080, WP 7084, WP 7493 and WP 7691.

The cavity shaftwall system has been evaluated for code compliance in UL Evaluation Report UL ER R3501-02.

Additionally, J-Track products are tested to rigorous standards. For example, a 25-gauge (.018 in. minimum steel thickness) J-Track exceeded 2,000,000 lateral load oscillation cycles in a test conducted to duplicate the positive and negative pressures created as elevator cabs rise and descend in a shaft.

Loading Performance. Although cavity shaftwall systems are non-load-bearing, this system has been designed and tested to withstand positive and negative air pressure forces exerted by high-speed, high-rise elevators.

Fire Resistance. Cavity shaftwall systems have been fire tested and have achieved fire-resistance ratings from one through four hours.

Sound Transmission. STC ratings of 40 to 56 have been achieved in tests conducted in accordance with ASTM E90. Refer to the Fire And Sound Selector on pages 32-62.

LIMITATIONS

1. Non-load-bearing.
2. Cavity shaftwall systems should not be used where exposed to constant dampness or conditions under which free water can be formed.
3. This system should not be exposed to temperatures over 125°F (51.7°C) for extended periods of time.
4. Where reference is made to nominal gauges, 25-gauge relates to minimum base steel of .018 in (.457 mm) and 20-gauge to .0329 in (.836 mm).

Installation

Shaftliner panels should be handled with care to prevent fracturing or deformation of edges.

FRAMING AND SHAFTLINER PANELS

1. Locate and lay out partition floor and ceiling lines to ensure plumb partition.
2. Ensure accurate stud spacing to maintain gypsum board face layer module.
3. Position top and bottom J-Track with long leg toward the shaft along ceiling, floor and vertically at column and/or wall where erection of shaftwall will begin. Attach with fasteners 24 in. (610 mm) o.c. max.

Cavity Shaftwall Systems Installation

4. Frame all openings for ducts with J-Track as shown in accompanying details to protect cut gypsum core edges and to provide resistance to bending and other stresses.
5. Cut shaftliner panels 1 in. (25.4 mm) less than ceiling height and install first by placing outside vertical edge against long leg of vertical track, plumb and attach with Type S 1-5/8 in. (41.3 mm) screws 24 in. (610 mm) o.c.
6. Place studs within flanges of floor and ceiling track and rotate into place. Slide stud tabs and flanges snugly over edge of shaftliner previously installed.
7. Install next shaftliner panel between tabs and flanges of studs. Continue in this manner until end of partition run. Occasionally check spacing of studs to maintain 24 in. (610 mm) module.
8. At the end of the run, cut vertical J-Track at least 2 in. (50.8 mm) short of partition height. Cut shaftliner 1/4 in. (6.4 mm) less than remaining width of partition and 2 in. (50.8 mm) short of full height. Lay piece of shaftliner 2 in. (50.8 mm) wide x length of opening in floor track as support for last shaftliner panel. Fit cut edge of shaftliner into vertical track and, holding shaftliner and track together, slide paper-bound edge of shaftliner into stud. Align last panel and fasten the vertical track with fasteners 24 in. (610 mm) o.c. max. Fasten shaftliner to vertical track with 1-5/8 in. (41.3 mm) Type S or S-12 Screws 24 in. (610 mm) o.c. Refer to page 361 for alternate detail.
9. Locate shaftwall horizontal end joints within the upper and lower third points of wall. Stagger joints in adjacent panels to avoid continuous horizontal joint. Shaftliner horizontal end joints do not require taping, back blocking or framing. When using I-Studs or C-T Studs, the shaftliner panels should be of sufficient length to engage a minimum of two tabs along the edge.

GYPSUM BOARD

For a two-hour fire rating, apply base layer 1/2 in. (12.7 mm) Fire-Shield® C or 5/8 in. (15.9 mm) Fire-Shield® Gypsum Board vertically to studs with 1 in. (25.4 mm) Type S screws 24 in. (610 mm) o.c. on side opposite shaftliner panel. Apply face layer 1/2 in. (12.7 mm) Fire-Shield C or 5/8 in. (15.9 mm) Fire-Shield Gypsum Board vertically with 1-5/8 in. (41.3 mm) Type S screws 12 in. (305 mm) o.c. Stagger vertical and horizontal joints.

Refer to the Fire And Sound Selector on pages 32-62 for more fire-rated assemblies using Nation Gypsum Company Cavity Shaftwall Systems.

CAULKING

Caulk cavity shaftwall system with an acoustical sealant wherever the wall is enclosing shafts where positive or negative air pressure exists. Caulk perimeter of wall and at any other place where voids create the possibility of moving air causing dust accumulation, noise or smoke leakage. Caulk in compliance with details specified by the architect or designer.

AIR SHAFTS

The system is not designed to serve as an unlined air-supply duct. Caulking is recommended at perimeters and penetrations wherever the shaftwall system is used to enclose elevators or other shafts where positive or negative pressures will exist. The contractor installing this system should caulk in compliance with details specified by the architect or designer. Proper caulking will seal perimeters and penetrations to minimize air noises and dust associated with air movement.

FRAMING FOR OPENINGS

Frame doors and duct openings with J-Track. Use adequate structural support for openings over 48 in. (1,219 mm) wide. For openings up to 48 in. (1,219 mm) wide, use vertical J-Track on either side of openings. For head and sill of openings, place J-Track horizontally across openings. Cut J-Track about 12 in. (305 mm) longer than openings. Then cut flanges and fold back to nest over vertical J-Track and fasten webs or flanges with two 3/8 in. (9.5 mm) Type S or 1/2 in. (12.7 mm) Type S-12 Pan-Head Screws per connection. When nesting J-Track to J-Track, cut off the short flange of horizontal J-Track so it will fit over the vertical J-Track.

CHASES

When possible, locate all vertical rise, conduit and stair hangers within wall cavity. If the cavity in the 2-1/2 in. (63.6 mm) stud wall is not of sufficient width, the 4 in. (102 mm) or 6 in. (152 mm) studs can be used.

ELEVATOR DOORS

Elevator door frames must be braced and supported independently of the shaftwall. However, the shaftwall must be tied into elevator door frames by being attached to jamb and anchor clips with pan-head screws. The 3 in. (76.2 mm) leg, nominal 20-gauge J-Track shall be used at the juncture of the elevator door frame and the Cavity Shaftwall System. Refer to pages 354-355 for details.

Door frames (other than elevator door frames) should be formed from not less than 18-gauge steel, shop primed, with throat openings accurately formed to the nominal wall thickness plus 3/32 in. (2.4 mm). Frames must have trim returns not less than 7/16 in. (11.1 mm) in width to bear flush against the gypsum board surface. Floor anchor plates should be 14-gauge (min.) steel, firmly welded to frames and designed with not less than two anchor holes 3 in. (76.2 mm) o.c. minimum to prevent frame rotation. Anchor plates should be securely fastened to the floor with fasteners having minimum dimensions of 3/16 in. (4.76 mm) diameter and 3/4 in. (19.1 mm) length. The type and size of fastener is dependent on job conditions, type of concrete or steel framing, and must be sufficient to provide rigid, continuous anchorage to the frames. Jamb anchor clips should be formed from minimum 18-gauge steel, and welded to jambs to provide adequate anchorage to jamb framing as shown on details. Elevator door frames must be fastened to and supported by the building structure, separately framed and independent of the partition. They should be securely anchored to the sills and to the building structure or to the track supports. Anchors or fastenings to suit the wall construction are required and should not be more than 24 in. (610 mm) apart. Refer to pages 354-355 for connection of partition and elevator door frames.

CALL BOXES AND POSITION INDICATORS

Protect call boxes, position indicators and fireman switch as shown in drawings on pages 354-355.

STAIR AND ELEVATOR ENCLOSURE HARDENING CODE REQUIREMENTS

High-rise buildings with an assigned risk category of III or IV and all buildings more than 420 ft. (128 m) in height are required to have higher resistance to hard- and soft-body impact in accordance with ASTM C1629.

STAIR AND ELEVATOR ENCLOSURES IN HIGH-RISE BUILDINGS

Stair and Elevator enclosures in high-rise buildings with an assigned risk category of III or IV and all buildings more than 420 ft. (128 m) in height are required to have resistance to hard- and soft-body impact. The shaft enclosure is required to meet or exceed a soft-body impact classification level 2 in accordance with ASTM C1629 and have a layer of impact-resistant material with a hard-body impact classification level 3 in accordance with ASTM C1629.

Gold Bond® BRAND Hi-Impact XP® Gypsum Board installed as the face layer on the tenant side of a 2-hour shaftwall meets both the hard- and soft-body impact requirements of the International Building Code.

2-HOUR HORIZONTAL MEMBRANE

For a 2-hour horizontal membrane, 1 in. (25.4 mm) Gold Bond Fire-Shield® Shaftliner is inserted between the flanges of 4 in. (102 mm) 20-gauge steel C-T studs 24 in. (610 mm) o.c. A base layer of 5/8 in. (15.9 mm) Fire-Shield® C Gypsum Board is applied at right angles to studs with 1 in. (25.4 mm) Type S screws 12 in. o.c. (305 mm). The second layer of 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board is applied at right angles to studs with 1-5/8 in. (41.3 mm) Type S screws 12 in. o.c. (305 mm). The face layer of 5/8 in. (15.9 mm) Fire-Shield C Gypsum Board is applied with long dimension parallel to studs with 2-1/4 in. (57.2 mm) Type S screws 12 in. (305 mm) o.c.

For spans greater than 8 ft. (2,438 mm), intermediate supports are constructed by fastening J-Tracks to each side of 6 in. (152 mm) steel track. The 6 in. (152 mm) steel track is suspended from the deck with 8-gauge steel wires 24 in. (610 mm) o.c. 2 in. x 6 in. (50.8 mm x 152 mm) strips of mineral wool insulation are draped over the J-Tracks on each side of the 6 in. (152 mm) track.

Cavity Shaftwall Systems Installation

Cavity Shaftwall Systems

TABLE 1 – C-T STUD LIMITING HEIGHT: Per ICC-ES AC 86 1995

Framing Depth	Minimum Steel	Deflection Limit	Limiting Height (ft./in.)			
			Design Pressure (psf)			
			5	7.5	10	15
2-1/2"	0.0231" 33,000 psi	L/120	16' 10"	13' 8"	11' 10"*	8' 6"*
		L/180	13' 8"	11' 3"	9' 10"	8' 3"
		L/240	11' 10"	9' 10"	8' 8"	7' 3"
		L/360	9' 10"	8' 3"	7' 3"	6' 2"
	0.0346" 33,000 psi	L/120	16' 10"	14' 4"	12' 11"	11' 1"
		L/180	14' 4"	12' 4"	11' 1"	9' 6"
		L/240	12' 11"	11' 1"	9' 11"	8' 7"
		L/360	11' 1"	9' 6"	8' 7"	7' 5"
	0.0451" 50,000 psi	L/120	17' 11"	15' 10"	14' 6"	12' 10"
		L/180	15' 10"	14' 0"	12' 10"	–
		L/240	14' 6"	12' 10"	–	–
		L/360	12' 10"	–	–	–
4"	0.0231" 33,000 psi	L/120	21' 8"	16' 6"*	12' 5"*	8' 3"*
		L/180	18' 1"	15' 3"	12' 5"*	8' 3"*
		L/240	16' 0"	13' 7"	12' 1"	8' 3"*
		L/360	13' 7"	11' 6"	10' 4"	8' 3"*
	0.0346" 33,000 psi	L/120	23' 0"	21' 0"	18' 7"	15' 5"***
		L/180	21' 0"	17' 9"	15' 10"	13' 6"
		L/240	18' 7"	15' 10"	14' 1"	12' 1"
		L/360	15' 10"	13' 6"	12' 1"	10' 4"
	0.0451" 50,000 psi	L/120	25' 7"	22' 2"	20' 0"	17' 4"
		L/180	22' 2"	19' 2"	17' 4"	15' 1"
		L/240	20' 0"	17' 4"	15' 8"	13' 7"
		L/360	17' 4"	15' 1"	13' 7"	11' 10"
6"	0.0346" 33,000 psi	L/120	30' 3"***	24' 9"***	20' 6"*	13' 8"*
		L/180	30' 3"	24' 9"***	20' 6"*	13' 8"*
		L/240	26' 6"	22' 2"	19' 7"	13' 8"*
		L/360	22' 2"	18' 8"	16' 7"	13' 8"*
	0.0451" 50,000 psi	L/120	36' 5"	30' 8"	27' 3"	23' 2"
		L/180	30' 8"	26' 0"	23' 2"	19' 9"
		L/240	27' 3"	23' 2"	20' 8"	17' 8"
		L/360	23' 2"	19' 9"	17' 8"	–

1. *Reduced for End Reaction Capacity. **Reduced for Flexural Strength Capacity.
 2. The values in this table are based on testing per ICC-ES AC 86 and ASTM E72 and represent the limiting height capacity for strength using a 1.5 Safety Factor.
 3. Minimum base steel thickness is 95% of design thickness.
 4. Limiting Height values shown were assessed from the lowest Flexural Strength value of gypsum tested.

TABLE 2 – ALLOWABLE WALL HEIGHTS^{1,2} FOR NATIONAL GYPSUM 1-HR AND 2-HR I-STUD ASSEMBLIES³

Wall System	Steel thickness (gauge/inch)	Deflection	Transverse Design Load (psf)			
			5	7.5	10	15
1 hour 2-1/2 in. Shaftwall	25 / 0.020	L/120	13 ft. 4 in.	11 ft. 7 in.	10 ft. 1 in.	8 ft. 3 in.
		L/240	10 ft. 7 in.	9 ft. 3 in.	8 ft. 5 in.	7 ft. 4 in.
		L/360	9 ft. 3 in.	8 ft. 11 in.	7 ft. 4 in.	6 ft. 5 in.
1 hour 2-1/2 in. Shaftwall	20 / 0.0329	L/120	15 ft. 2 in.	13 ft. 3 in.	12 ft. 1 in.	10 ft. 7 in.
		L/240	12 ft. 1 in.	10 ft. 7 in.	9 ft. 7 in.	8 ft. 4 in.
		L/360	10 ft. 7 in.	9 ft. 2 in.	8 ft. 4 in.	7 ft. 4 in.
1 hour 4 in. Shaftwall	25 / 0.020	L/120	17 ft. 11 in.	14 ft. 10 in.	12 ft. 10 in.	9 ft. 9 in.
		L/240	14 ft. 3 in.	12 ft. 5 in.	11 ft. 4 in.	9 ft. 5 in.
		L/360	12 ft. 5 in.	10 ft. 10 in.	9 ft. 5 in.	8 ft. 3 in.
1 hour 4 in. Shaftwall	20 / 0.0329	L/120	20 ft. 0 in.	18 ft. 2 in.	16 ft. 6 in.	14 ft. 3 in.
		L/240	16 ft. 6 in.	14 ft. 5 in.	13 ft. 1 in.	11 ft. 5 in.
		L/360	14 ft. 5 in.	12 ft. 7 in.	11 ft. 5 in.	9 ft. 4 in.
1 hour 6 in. Shaftwall	20 / 0.0329	L/120	24 ft. 0 in.	22 ft. 10 in.	19 ft. 9 in.	16 ft. 2 in.
		L/240	20 ft. 11 in.	18 ft. 4 in.	16 ft. 8 in.	14 ft. 6 in.
		L/360	18 ft. 4 in.	16 ft. 0 in.	14 ft. 6 in.	10 ft. 11 in.
2 hour 2-1/2 in. Shaftwall	25 / 0.020	L/120	14 ft. 7 in.	12 ft. 4 in.	10 ft. 9 in.	8 ft. 9 in.
		L/240	11 ft. 7 in.	10 ft. 1 in.	9 ft. 2 in.	8 ft. 0 in.
		L/360	10 ft. 1 in.	8 ft. 10 in.	8 ft. 0 in.	7 ft. 0 in.
2 hour 2-1/2 in. Shaftwall	20 / 0.0329	L/120	17 ft. 9 in.	15 ft. 6 in.	14 ft. 1 in.	12 ft. 4 in.
		L/240	14 ft. 1 in.	12 ft. 4 in.	11 ft. 2 in.	8 ft. 9 in.
		L/360	12 ft. 4 in.	9 ft. 8 in.	8 ft. 9 in.	7 ft. 8 in.
2 hour 4 in. Shaftwall	25 / 0.020	L/120	19 ft. 10 in.	16 ft. 3 in.	14 ft. 0 in.	10 ft. 2 in.
		L/240	16 ft. 2 in.	14 ft. 2 in.	11 ft. 6 in.	10 ft. 0 in.
		L/360	14 ft. 2 in.	11 ft. 0 in.	10 ft. 0 in.	8 ft. 9 in.
2 hour 4 in. Shaftwall	20 / 0.0329	L/120	23 ft. 2 in.	20 ft. 2 in.	18 ft. 1 in.	14 ft. 9 in.
		L/240	18 ft. 4 in.	16 ft. 1 in.	14 ft. 7 in.	11 ft. 1 in.
		L/360	16 ft. 1 in.	14 ft. 0 in.	11 ft. 1 in.	9 ft. 8 in.
2 hour 6 in. Shaftwall	20 / 0.0329	L/120	28 ft. 0 in.	23 ft. 11 in.	20 ft. 9 in.	16 ft. 11 in.
		L/240	22 ft. 9 in.	19 ft. 10 in.	18 ft. 0 in.	12 ft. 10 in.
		L/360	19 ft. 10 in.	17 ft. 4 in.	12 ft. 10 in.	11 ft. 2 in.
2 hour 2-1/2 in. Stairwell	25 / 0.020	L/120	13 ft. 11 in.	12 ft. 2 in.	11 ft. 0 in.	9 ft. 8 in.
		L/240	11 ft. 0 in.	9 ft. 8 in.	8 ft. 9 in.	7 ft. 8 in.
		L/360	9 ft. 8 in.	8 ft. 5 in.	7 ft. 8 in.	6 ft. 8 in.
2 hour 2-1/2 in. Stairwell	20 / 0.0329	L/120	16 ft. 7 in.	14 ft. 6 in.	13 ft. 2 in.	11 ft. 6 in.
		L/240	13 ft. 2 in.	11 ft. 6 in.	9 ft. 10 in.	8 ft. 7 in.
		L/360	11 ft. 6 in.	10 ft. 0 in.	8 ft. 7 in.	7 ft. 6 in.
2 hour 4 in. Stairwell	25 / 0.020	L/120	20 ft. 2 in.	17 ft. 8 in.	16 ft. 0 in.	11 ft. 11 in.
		L/240	16 ft. 0 in.	11 ft. 11 in.	10 ft. 10 in.	9 ft. 5 in.
		L/360	11 ft. 11 in.	10 ft. 5 in.	9 ft. 5 in.	8 ft. 3 in.
2 hour 4 in. Stairwell	20 / 0.0329	L/120	22 ft. 3 in.	19 ft. 6 in.	17 ft. 8 in.	15 ft. 6 in.
		L/240	17 in. 8 in.	15 ft. 6 in.	14 ft. 1 in.	10 ft. 8 in.
		L/360	15 ft. 6 in.	11 ft. 9 in.	10 ft. 8 in.	9 ft. 4 in.
2 hour 6 in. Stairwell	20 / 0.0329	L/120	28 ft. 0 in.	24 ft. 10 ft.	22 ft. 7 in.	19 ft. 9 in.
		L/240	22 ft. 7 in.	19 ft. 9 in.	17 ft. 11 in.	12 ft. 3 in.
		L/360	19 ft. 9 in.	13 ft. 6 in.	12 ft. 3 in.	10 ft. 9 in.

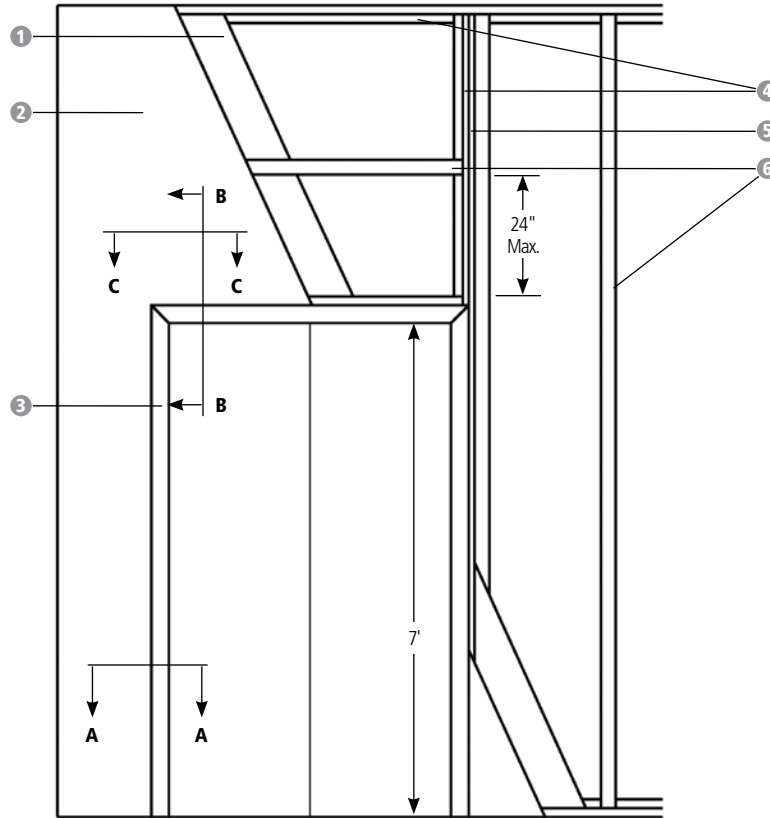
For SI: 1 inch = 25.4 mm
1 foot = 305 mm
1 psf = 48 Pa

1. Allowable heights are based on transverse load tests complying with AC86, dated July 1995, with studs spaced a maximum of 24 inches on center.
2. Limiting height is based on the lesser height of deflection or strength.
3. The hourly ratings indicate that the assemblies described by this table were constructed the same as the hourly fire-rated assemblies described in this report. The fire-rated assemblies were tested at 10 ft. height as per standards ASTM E119 and UL263.

Cavity Shaftwall Systems Elevator Shaftwall Enclosures

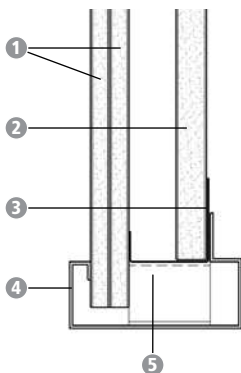
SHAFTWALL FRAMING FOR ELEVATOR DOORS – UP TO 7'-0"

1. 1" Fire-Shield Shaftliner
2. Two Layers Fire-Shield Gypsum Board
3. Elevator Door Frame
4. 25-Ga. 2-1/4" Leg J-Track
5. 20-Ga. 3" Leg J-Track
6. C-T, C-H or I-Stud



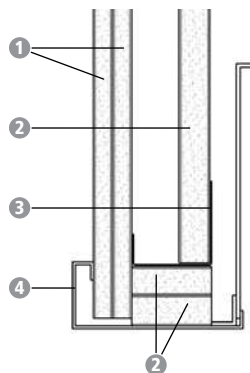
SHAFTWALL ELEVATOR DOOR JAMB (SECTION A-A)

1. Two Layers Fire-Shield Gypsum Board
2. 1" Fire-Shield Shaftliner
3. 20-Ga. 3" Leg J-Track
4. Elevator Door Frame
5. Jamb Anchor Clip



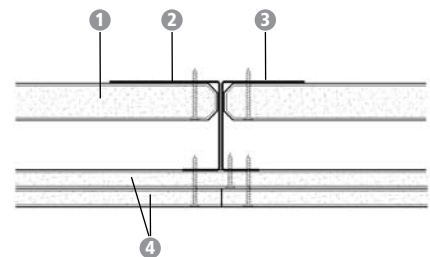
SHAFTWALL ELEVATOR DOOR HEAD (SECTION B-B)

1. Two Layers Fire-Shield Gypsum Board
2. 1" Fire-Shield Shaftliner
3. 25-Ga. 2-1/4" Leg J-Track
4. Elevator Door Frame



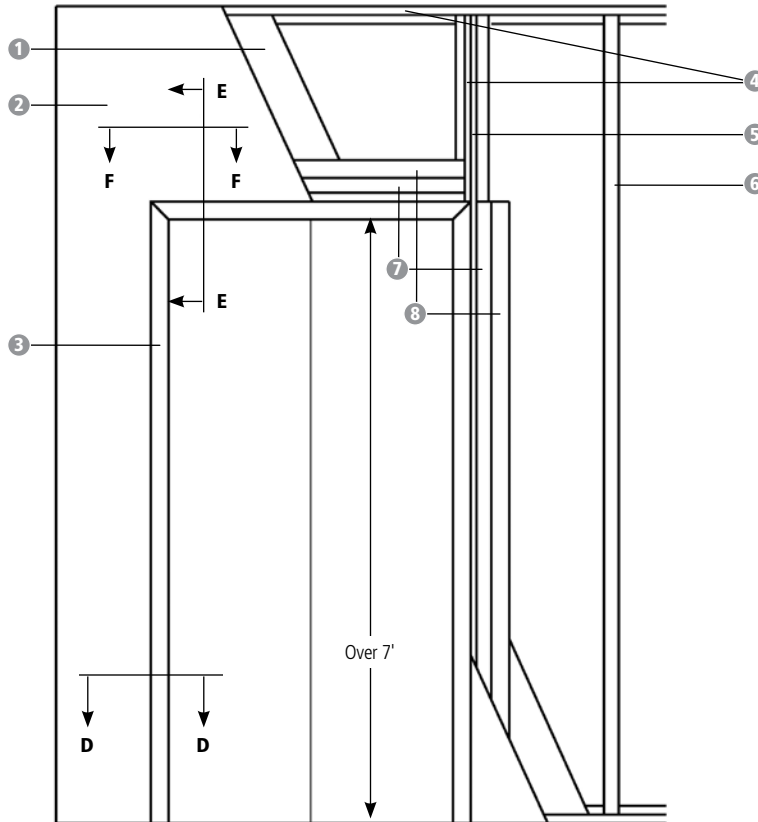
SHAFTWALL J-TRACK FRAMING ELEVATOR DOORS – UP TO 7'-0" (SECTION C-C)

1. 1" Fire-Shield Shaftliner
2. 20-Ga. 3" Leg J-Track
3. 25-Ga. 2-1/4" Leg J-Track
4. Two Layers Fire-Shield Gypsum Board



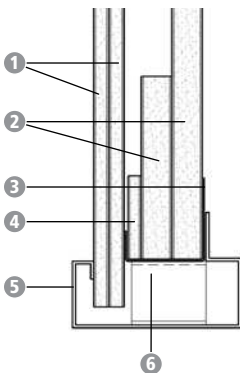
SHAFTWALL FRAMING FOR ELEVATOR DOORS – OVER 7'0"

1. 1" Fire-Shield Shaftliner
2. Two Layers 1/2" Fire-Shield C Gypsum Board
3. Elevator Door Frame
4. 25-Ga. 2-1/4" Leg J-Track
5. 20-Ga. 3" Leg J-Track
6. C-T, C-H or I-Stud
7. 1/2" Gypsum Board Filler
8. 1" Gypsum Board Filler



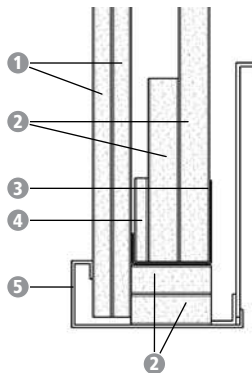
SHAFTWALL ELEVATOR DOOR JAMB (SECTION D-D)

1. Two Layers Fire-Shield Gypsum Board
2. 1" Fire-Shield Shaftliner
3. 20-Ga. 3" Leg J-Track
4. 1/2" Fire-Shield C Gypsum Board
5. Elevator Door Frame
6. Jamb Anchor Clip



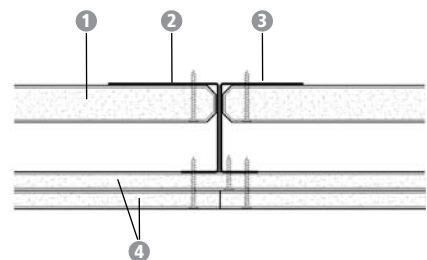
SHAFTWALL ELEVATOR DOOR HEAD (SECTION E-E)

1. Two Layers Fire-Shield Gypsum Board
2. 1" Fire-Shield Shaftliner
3. 25-Ga. 2-1/4" Leg J-Track
4. 1/2" Fire-Shield C Gypsum Board
5. Elevator Door Frame



SHAFTWALL J-TRACK FRAMING ELEVATOR DOORS – OVER 7'0" (SECTION F-F)

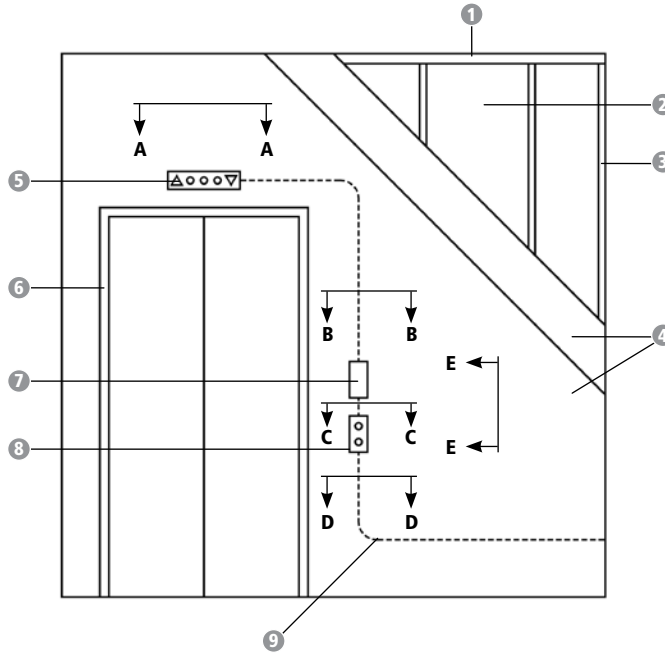
1. 1" Fire-Shield Shaftliner
2. 20-Ga. 3" Leg J-Track
3. 25-Ga. 2-1/4" Leg J-Track
4. Two Layers Fire-Shield Gypsum Board



Cavity Shaftwall Systems Technical Details

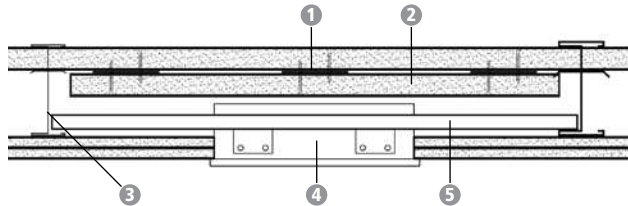
SHAFTWALL ELEVATOR ELECTRICAL CONTROL LAYOUT

1. J-Track
2. 1" Fire-Shield Shaftliner
3. C-T, C-H or I- Stud
4. 1/2" Fire-Shield C or 5/8" Fire-Shield Gypsum Board
5. Position Indicator
6. Elevator Door Frame
7. Fireman Switch
8. Call Box
9. Conduit



SHAFTWALL POSITION INDICATOR BOX (SECTION AA)

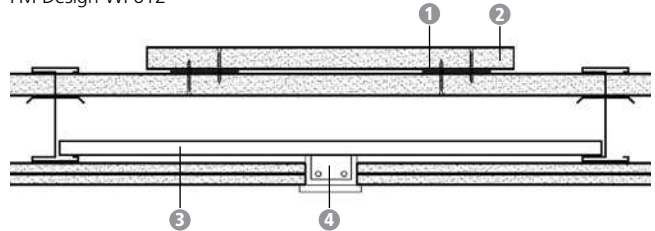
FM Design WP612



1. 25-Ga. x 3" x 14" Sheet Steel
2. 1" x 22" x 16" Fire-Shield Shaftliner
3. 4" Shaftwall Stud
4. Position Indicator
5. 3/4" C.R. Channel

SHAFTWALL FIREMAN SWITCH (SECTION BB)

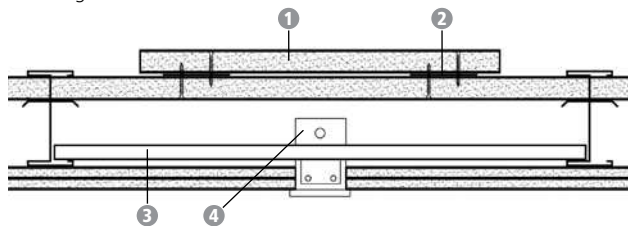
FM Design WP612



1. 25-Ga. x 3" x 14" Sheet Steel
2. 1" x 22" x 16" Fire-Shield Shaftliner
3. 3/4" C.R. Channel
4. Fireman Switch

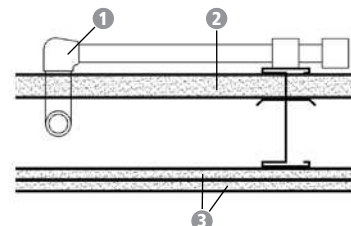
SHAFTWALL CALL BOX (SECTION CC)

FM Design WP621



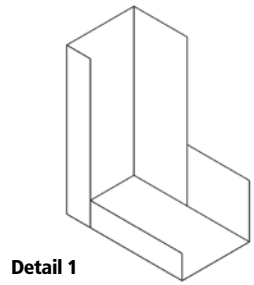
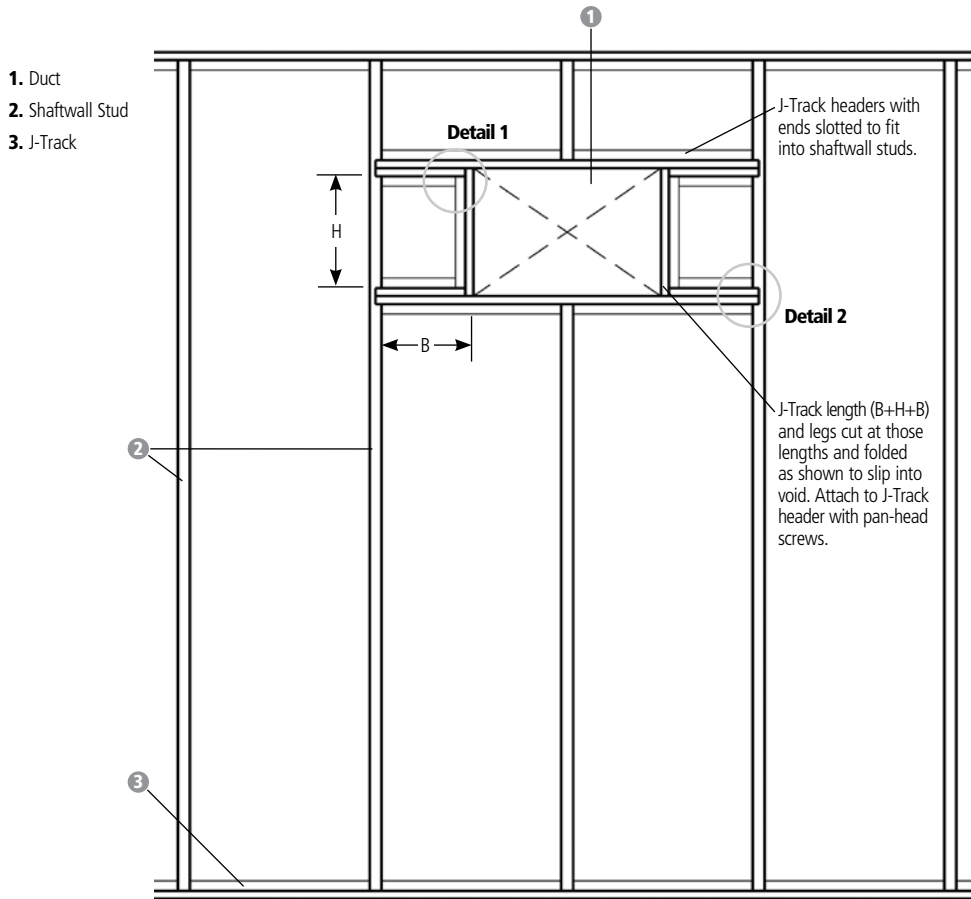
1. 1" x 16" x 30" Fire-Shield Shaftliner
2. 25-Ga. x 3" x 28" Sheet Steel
3. 3/4" C.R. Channel
4. Call Box

SHAFTWALL WITH CONDUIT (SECTION DD)



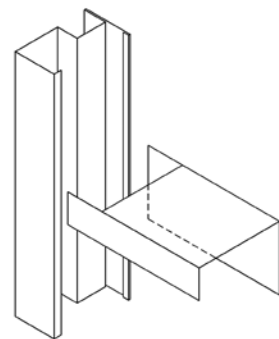
1. Rigid Elbow and Conduit
2. 1" Fire-Shield Shaftliner
3. Fire-Shield Gypsum Board

SHAFTWALL FRAMING AT DUCT PENETRATION



Detail 1

J-Track cut and folded to frame duct and fastened with pan-head screws.



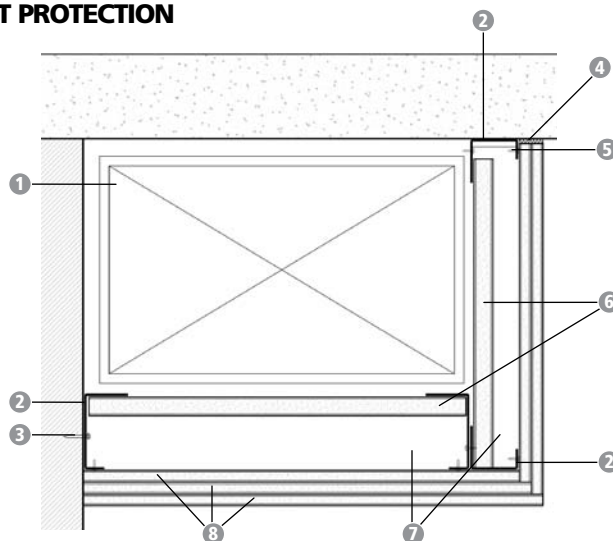
Detail 2

Cut web from J-Track to receive C-T Stud and fasten with pan-head screws.

2-HOUR HORIZONTAL DUCT PROTECTION

UL Design G586

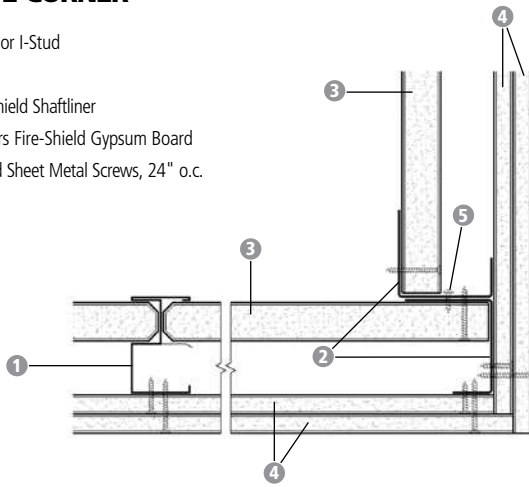
1. Duct
2. J-Track
3. Fasteners 24" o.c.
4. Flexible Sealant
5. 1/2" Type S or S-12 Pan-Head Screws (2 per Stud)
6. 1" Fire-Shield Shaftliner
7. C-T Stud 24" o.c.
8. 5/8" Fire-Shield C Gypsum Board



Cavity Shaftwall Systems Technical Details

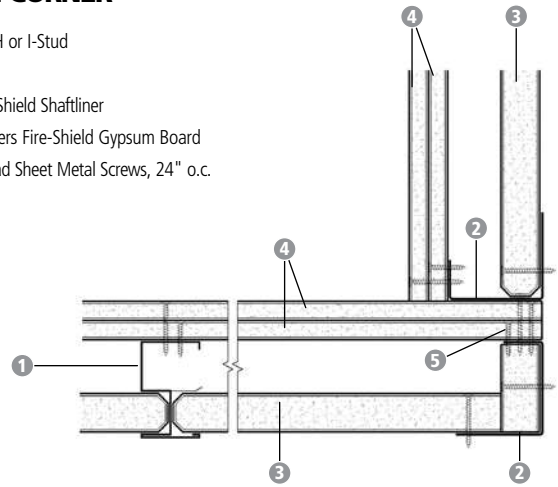
OUTSIDE CORNER

1. C-T, C-H or I-Stud
2. J-Track
3. 1" Fire-Shield Shaftliner
4. Two layers Fire-Shield Gypsum Board
5. Pan-Head Sheet Metal Screws, 24" o.c.



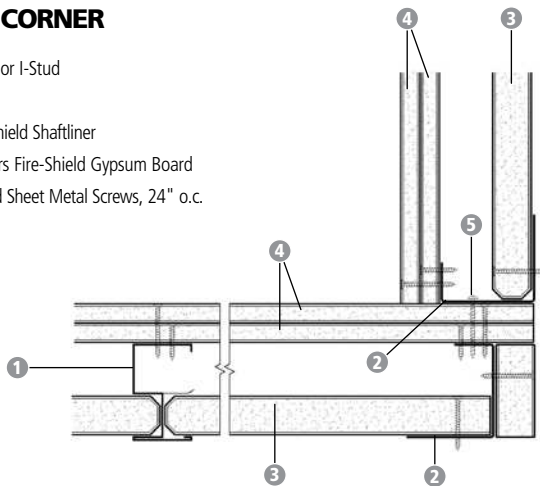
INSIDE CORNER

1. C-T, C-H or I-Stud
2. J-Track
3. 1" Fire-Shield Shaftliner
4. Two layers Fire-Shield Gypsum Board
5. Pan-Head Sheet Metal Screws, 24" o.c.



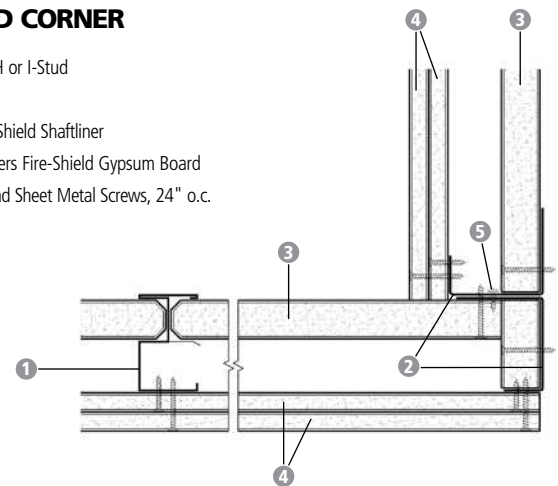
INSIDE CORNER

1. C-T, C-H or I-Stud
2. J-Track
3. 1" Fire-Shield Shaftliner
4. Two layers Fire-Shield Gypsum Board
5. Pan-Head Sheet Metal Screws, 24" o.c.



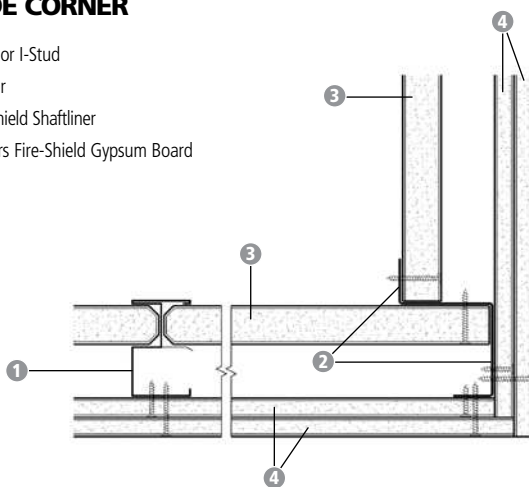
HYBRID CORNER

1. C-T, C-H or I-Stud
2. J-Track
3. 1" Fire-Shield Shaftliner
4. Two layers Fire-Shield Gypsum Board
5. Pan-Head Sheet Metal Screws, 24" o.c.



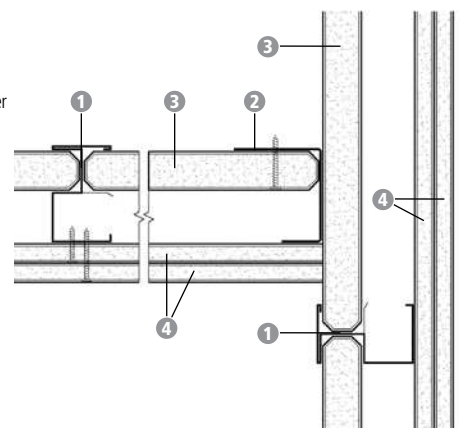
OUTSIDE CORNER

1. C-T, C-H or I-Stud
2. J-L Corner
3. 1" Fire-Shield Shaftliner
4. Two layers Fire-Shield Gypsum Board



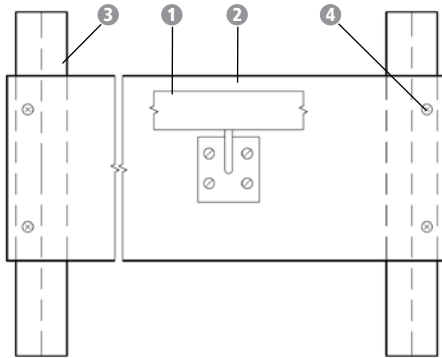
SHAFTWALL INTERSECTION

1. C-T, C-H or I-Stud
2. J-Track
3. 1" Fire-Shield Shaftliner
4. Two layers Fire-Shield Gypsum Board



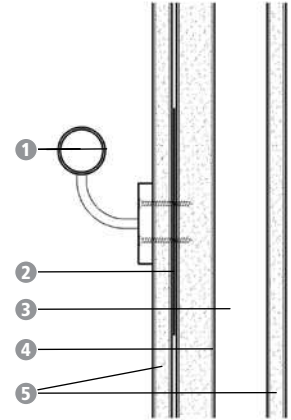
HANDRAIL SUPPORT ELEVATION

1. Handrail
2. 20-Ga. x 6" x 26" Sheet Metal Plate
3. C-T, C-H or I-Stud
4. Pan-Head Sheet Metal Screws



HANDRAIL SUPPORT DETAILS

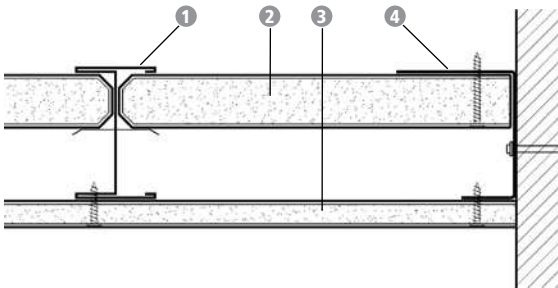
1. Handrail
2. 20-Ga. x 6" x 26" Sheet Metal Plate
3. C-T, C-H or I-Stud
4. 1" Fire-Shield Shaftliner
5. Fire-Shield Gypsum Board



1-HOUR HORIZONTAL SHAFTWALL – CORRIDOR CEILING AND STAIR SOFFIT

UL Evaluation Report
UL ER R3501-02

1. I-Stud, 24" o.c.
2. 1" Fire-Shield Shaftliner
3. 5/8" Fire-Shield Gypsum Board
4. J-Track



2-HOUR HORIZONTAL SHAFTWALL – CORRIDOR CEILING AND STAIR SOFFIT

UL Evaluation Report
UL ER R3501-02

1. I-Stud, 24" o.c.
2. 1" Fire-Shield Shaftliner
3. Two Layers 5/8" Fire-Shield Gypsum Board
4. J-Track

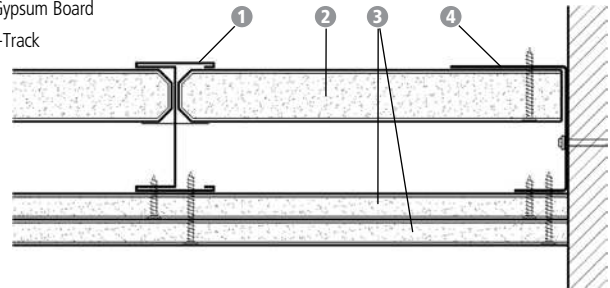


TABLE 3 – MAXIMUM HORIZONTAL SPANS^{1,2}

I-Stud Size and Thickness (Inches/Gauge)	Corridor Ceilings and Underside of Stairs			Horizontal Membrane and Duct Protection
	One layer of 5/8" gypsum board on one side and one layer 1" Shaftliner on the other side.	Two layers of 1/2" gypsum board on one side and one layer 1" Shaftliner on the other side.	Two layers of 5/8" gypsum board on one side and one layer 1" Shaftliner on the other side.	Three layers of 1/2" gypsum board on one side and one layer 1" Shaftliner on the other side.
2-1/2 (25)	7' 8"	7' 8"	7' 7"	5' 4"
2-1/2 (20)	8' 8"	9' 4"	9' 2"	5' 4"
4 (25)	10' 3"	10' 9"	10' 7"	5' 4"
4 (20)	11' 9"	12' 1"	11' 11"	5' 4"
6 (20)	14' 10'	14' 10"	14' 8"	5' 4"

For SI: 1 inch = 25.4 mm
1 foot = 305 mm

1. Calculations based on systems supporting twice their own dead weights and should not be used where there is access to an attic or loft space above, or anywhere where there is any probability of storage above.
2. Spans are based upon a deflection limitation of L/240.

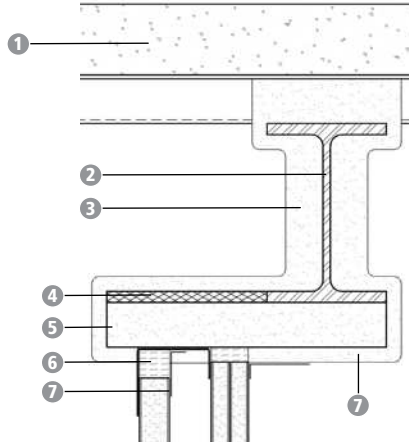
Refer to UL Evaluation Report R3501-02.

Cavity Shaftwall Systems Technical Details

SHAFTWALL OFFSET FROM STEEL BEAM

UL Design HW-D-0645
UL Design HW-D-0636

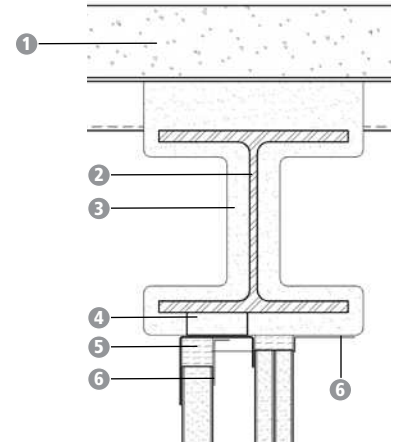
1. Concrete on Fluted Steel Deck
2. Steel Beam
3. Spray-Applied Fire-Resistive Material
4. 3/8 in. Diamond Mesh Expanded Steel LAth
5. 1-1/2" Z-Furring or Channels 24" o.c.
6. Mineral Wool Insulation
7. Elastomeric Spray Firestop



2-HOUR SHAFTWALL PARTITION TO STEEL BEAM

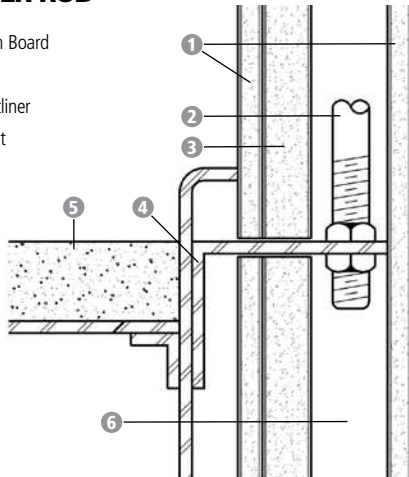
UL Design HW-D-0642
UL Design HW-D-0571

1. Concrete on Fluted Steel Deck
2. Steel Beam
3. Spray-Applied Fire-Resistive Material
4. 20-Gauge Z-Clips 24" o.c. Maximum, Fasten Before Application of Spray-on Fireproofing
5. Mineral Wool Insulation
6. Elastomeric Spray Firestop



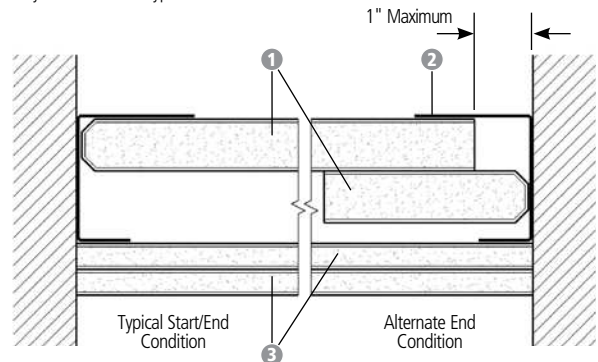
STAIR HANGER ROD

1. Fire-Shield Gypsum Board
2. Steel Hanger Rod
3. 1" Fire-Shield Shaftliner
4. Steel Angle Bracket
5. Stair Landing
6. C-T, C-H or I-Stud



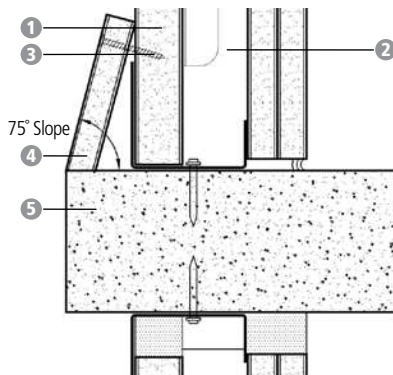
START-END CONDITION

1. 1" Fire-Shield Shaftliner
2. J-Track
3. Two Layers Fire-Shield Gypsum Board



SHAFT CANTS

1. 1" Fire-Shield Shaftliner
2. C-T, C-H or I-Stud
3. Cants Screwed to Shaftwall Studs
4. Gypsum Board Cant Strips Generally Required to Prevent Ledges More Than 2" Wide
5. Floor Slab

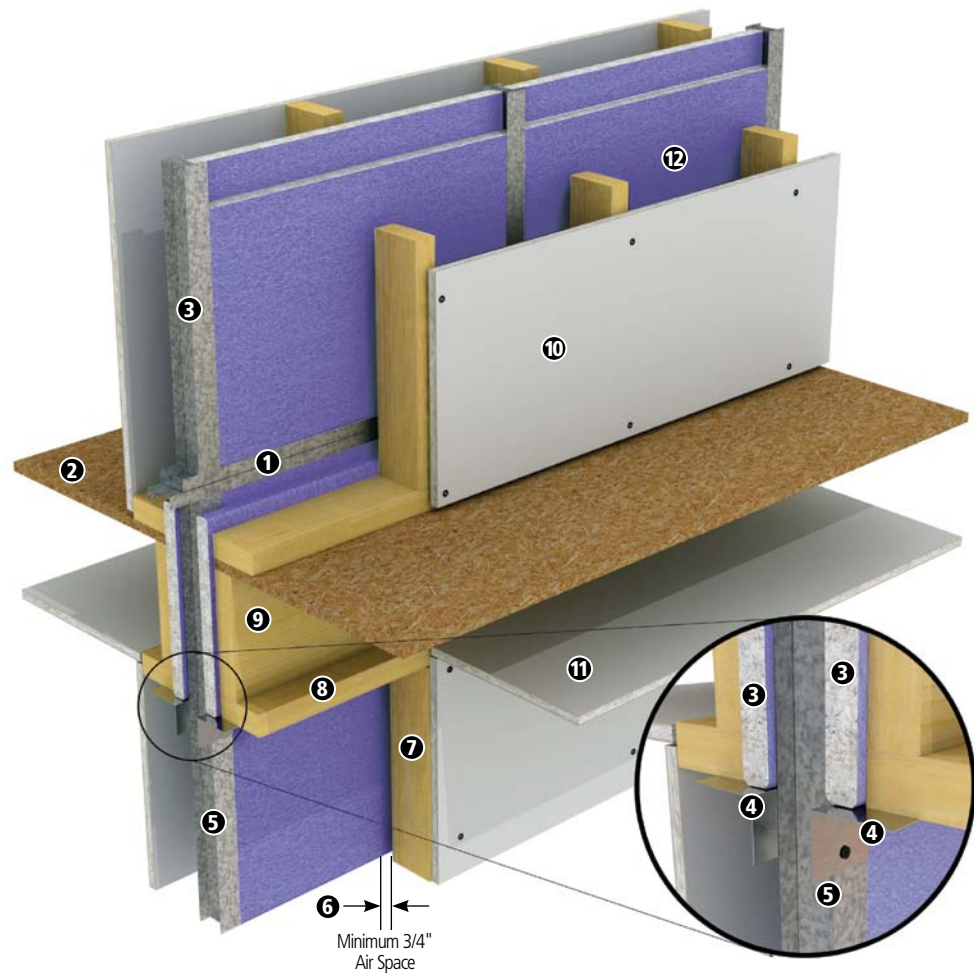


Area Separation Wall System

The Area Separation Wall System is a 2-hour fire wall consisting of 2 in. (50.8 mm) light-gauge steel H-Studs that secure two layers of 1 in. (25.4 mm) shaftliner panels friction-fit between studs and a minimum 3/4 in. (19.1 mm) air space on each side.

TYPICAL FLOOR/CEILING JUNCTURE

1. Double C-Track (back to back)
2. Subfloor
3. Fire Blocking 1" Fire-Shield® Shaftliner or Mineral Wool
4. ASW Clip
5. H-Stud
6. Minimum 3/4" Air Space
7. Stud
8. Top Plate
9. Stringer
10. Gypsum Board
11. Ceiling
12. Two Layers 1" Shaftliner XP®



Area Separation Wall System



Area Separation Wall System

Description

National Gypsum Company produces three shaftliner products for use in the Area Separation Wall System:

Gold Bond® BRAND Fire-Shield® Shaftliner consists of a fire-resistant gypsum core encased in a heavy, moisture-resistant and green paper that is made from 100-percent recycled content.

Gold Bond® BRAND XP® Shaftliner consists of a mold-, mildew-, moisture- and fire-resistant gypsum core with a specially designed PURPLE® paper that offers superior resistance to mold and mildew.

Gold Bond® BRAND EXP® Shaftliner consists of a fire-resistant gypsum core encased in a coated, specially designed PURPLE® fiberglass mat facer for superior mold, mildew and moisture resistance.

The steel H-Studs are attached on each side to adjacent framing with aluminum ASW break-away clips. The clips melt when exposed to heat and allow the collapse of the fire-exposed unit without failure of the area separation wall.

The H-Studs are secured at the foundation by the flanges of the C-Track. The same track is used back-to-back at intermediate floors to provide a splicing means so that the system can be erected one floor at a time. C-Tracks are also used at the roof line or at the parapet and at the ends of walls.

For a 2-hour, fire-rated assembly without the need for battens, maintain a minimum 3/4 in. (19.1 mm) air space between the H-Stud assembly and any adjacent framing members. When you cannot maintain a minimum 3/4 in. (19.1 mm) air space, cover the H-Studs and C-Tracks by gypsum board battens. In lieu of battens, fasten gypsum board to the H-Studs, and treat joints with tape and joint compound to provide a finished wall surface.

Wood- or steel-stud flanking walls on each side of the area separation wall system can be load-bearing and can accommodate mechanical, electrical and plumbing systems. Install mineral wool or glass fiber insulation to provide higher STC ratings.

Technical Data

The Area Separation Wall System has a non-bearing wall rating of 2 hours and is listed in the UL Fire Resistance Directory as Design No. U347 and in the GA-600 Fire Resistance Manual as file numbers ASW 0800, ASW 0981 and ASW 0998.

The Area Separation Wall System has been evaluated for code compliance in UL Evaluation Report UL ER R3501-01.

The Area Separation Wall System may be built up to a maximum of 66 ft. (20.1 m) high.

Do not use the Area Separation Wall System where exposure to constant dampness and/or water may occur.

Although steel framing and Gold Bond® BRAND EXP® Gypsum Panels can withstand temporary exposure to moisture during construction, protect the finished wall as soon as possible.

Protect insulation in the Area Separation Wall from getting wet. Do not install until the building is enclosed.

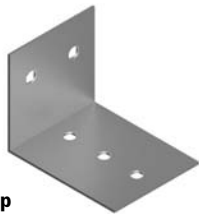
Properly store materials supplied to the jobsite, support off the ground, and protect from inclement weather.

Installation

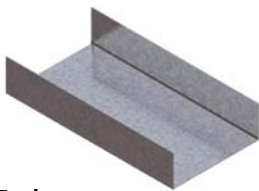
1. Attach 2 in. (50.8 mm) C-Tracks to the top of the foundation 3/4 in. (19.1 mm) from the adjacent framed wall with fasteners spaced 24 in. (610 mm) o.c. Apply acoustical sealant along edges of track to minimize sound transmission.
2. Install C-Track on the ends of stepped foundation walls aligned with the Area Separation Wall and, if applicable, with fasteners 24 in. (610 mm) o.c. Caulk edges as with the floor track.
3. At the intersection of foundation and the exterior wall, begin erecting Area Separation Wall by inserting first layer of 1 in. (25.4 mm) shaftliner into C-Track. Insert second layer back-to-back with first layer and seat into C-Track. Shaftliner and studs may be set into position from the basement floor or fed down through the space provided between the wood framing from the floor above. Cap the terminating edge of the shaftliner panels with a vertical C-Track at the end of the foundation and fasten to the floor track with 3/8 in. (9.5 mm) Type S pan-head screws.

AREA SEPARATION WALL LIMITING HEIGHTS

1. Roof
2. Stringer
3. Top Plate
4. 2 Layers Shaftliner XP®
5. H-Stud
6. Double C-Track
(Back-to-Back)
7. XP® Gypsum Board
8. Fire Blocking
1" Shaftliner XP®
or Mineral Wool
9. ASW Clip
10. Stud
11. Blocking
12. Floor
13. Ceiling
14. Minimum 3/4" Air Space
15. Slab or Foundation



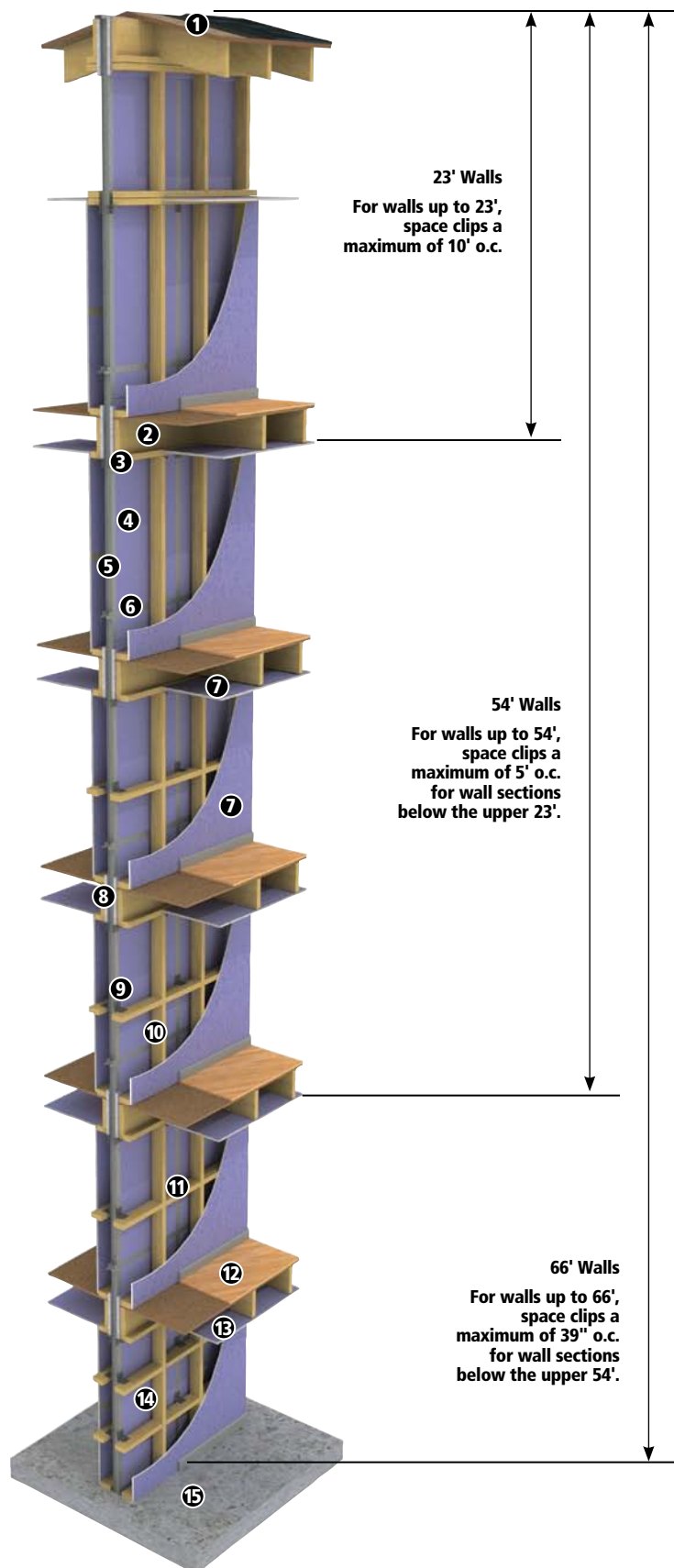
ASW Clip



C-Track



H-Stud



23' Walls
For walls up to 23',
space clips a
maximum of 10' o.c.

54' Walls
For walls up to 54',
space clips a
maximum of 5' o.c.
for wall sections
below the upper 23'.

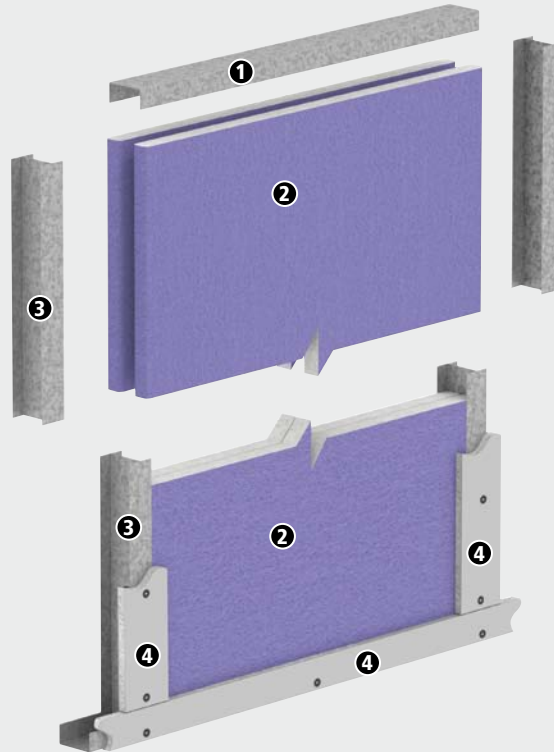
66' Walls
For walls up to 66',
space clips a
maximum of 39" o.c.
for wall sections
below the upper 54'.

Area Separation Wall System

4. Insert an H-Stud into the C-Track and engage the H-Stud flanges over the long edges of the shaftliner panels, making sure that both pieces of shaftliner are seated all the way into the C-Tracks and that their edges are flush. Seat the H-Stud fully so the board edges contact the stud web.
5. Continue in this manner, alternating two layers of shaftliner and H-Studs with the flanges of the H-Studs engaging the shaftliner edges until the wall is completed. Again, make sure all studs and boards are tightly pushed together. H-Studs may be fastened to C-Track with 3/8 in. (9.5 mm) Type S pan-head screws to assist with installation.
6. Where the Area Separation Wall forms a corner, cap the ends of the shaftliner panels with a vertical C-Track and fasten to the floor track with 3/8 in. (9.5 mm) pan-head screws. Fasten a C-Track to the foundation or floor at a right angle to the installed Area Separation Wall with fasteners 24 in. (610 mm). Fasten the web of another vertical C-Track to the flange of the installed vertical C-Track capping the edges of the shaftliner panels with 3/8 in. (9.5 mm) pan-head screws 24 in. o.c. to create the corner. Continue installing shaftliner panels and H-Studs in the same manner.
7. If the Area Separation Wall terminates at a foundation wall, insert the last two shaftliner panels from the floor above. Boards are pushed down into the channel formed by the flanges of the previous H-Stud and the flanges of the wall track.
8. If the Area Separation Wall terminates at or past a framed wall, insert the last shaftliner panels and cap the end of the Area Separation Wall with 2 in. (50.8 mm) C-Track. Fasten C-Track flanges at all corners on both sides with 3/8 in. (9.5 mm) Type S pan-head screws.
9. Where one unit extends past the adjacent unit, there are two methods for constructing the Area Separation Wall. The first option is to continue the Area Separation Wall to the farthest point of the building. Fasten 1/2 in. (12.7 mm) plywood or OSB to the H-Studs with Type S screws 12 in. (305 mm) to apply vinyl siding or cement board siding. (Refer to page 363.) The second option is to terminate the Area Separation Wall at the end of the common wall and construct a 1-hour wall to the farthest point of the building.
10. Where one unit extends vertically past the adjacent unit, extend the Area Separation Wall to the uppermost point of the building. Fasten 1/2 in. (12.7 mm) plywood or OSB to the H-Studs with Type S screws 12 in. (305 mm) to apply vinyl siding or cement board siding. (Refer to page 363.)
11. Cap the top edge of the erected wall with 2 in. (50.8 mm) C-Track over studs and Shaftliner. C-Track may be fastened to H-Studs with 3/8 in. (9.5 mm) Type S pan-head screws to assist with installation.
12. Where another Area Separation Wall intersects the installed area separation wall, fasten a C-Track to the foundation or floor at a right angle to the installed Area Separation Wall with fasteners 24 in. (610 mm). Attach the web of a vertical C-Track to the flange of an H-Stud with 3/8 in. (9.5 mm) pan-head screws 24 in. (610 mm) o.c. Continue installing shaftliner panels and H-Studs in the same manner. (Refer to details on page 363.)
13. Attach H-Studs to adjacent framing with ASW clips. Fasten the clips to the H-Studs with one 3/8 in. (9.5 mm) Type S pan-head screw through the short leg of the clip. Attach the ASW clips directly to the H-Studs or through the gypsum board battens to the studs. Attach clips to adjacent framing with one 1-1/4 in. (31.8 mm) Type W screw for wood and Type S screw for steel.
14. Maintain a minimum 3/4 in. (19.1 mm) air space between the H-Stud assembly and any adjacent framing members. When you cannot maintain a 3/4 in. (19.1 mm) air space, cut gypsum board batten strips from pieces of 5/8 in. (15.9 mm) Fire-Shield or 1/2 in. (12.7 mm) Fire-Shield® C Gypsum Board and install over H-Studs and C-Tracks. 3 in. (76.2 mm) wide battens are installed over C-Track at foundation and roof. 6 in. (152 mm) wide battens are fastened to the H-Studs with 1 in. (25.4 mm) Type S screw 12 in. (305 mm) o.c. screwed into alternate flanges of the H-Studs.
15. Attach 2 in. (50.8 mm) C-Track to the installed track capping off the wall of the lower floor. This back-to-back track installation allows you to erect the Area Separation Wall one floor at a time. Secure the two tracks together with two 3/8 in. (9.5 mm) Type S pan-head screws 24 in. (610 mm) o.c. Stagger back-to-back track joints a minimum of 12 in. (305 mm).

BASIC COMPONENTS OF AREA SEPARATION WALL

1. 2" C-Track
2. 1" Shaftliner XP®
3. 2" H-Stud
4. 1/2" Fire-Shield® C Gypsum Batten



16. For applications where a floor overhangs the floor below, the C-Track can be cantilevered 24 in. (610 mm) from the C-Track, capping the wall of the lower floor. A 36 in. (914 mm) cantilever can be achieved in the same manner when diagonal steel strapping is applied to each side of the wall.
17. For additional vertical sections, erect shaftliner and H-Studs in the same manner as the basement wall, steps 4-10, except that starting and ending procedures vary depending on the exterior wall intersection detail.
18. At the roof intersection, cap the walls with C-Tracks abutting the underside of the roof sheathing. C-Tracks can be fastened to H-Studs with 3/8 in. (9.5 mm) Type S pan-head screws to assist with installation. Fasten H-Studs to framing with ASW clips at the roof line.
19. Provide fire blocking at intermediate floors, roof locations, and horizontally every 10 ft. (3,048 mm). Use mineral wool, gypsum board or non-combustible, spray-firestop sealants.

20. The 2 in. (50.8 mm) Area Separation Wall system can be finished in a variety of ways, depending on wall installation. Wood stud or steel stud walls flanking the Area Separation Wall may be finished in any method specified. Where appearance is not critical and flanking walls are not installed, the Area Separation Wall and battens may be left unfinished.

Recommendations

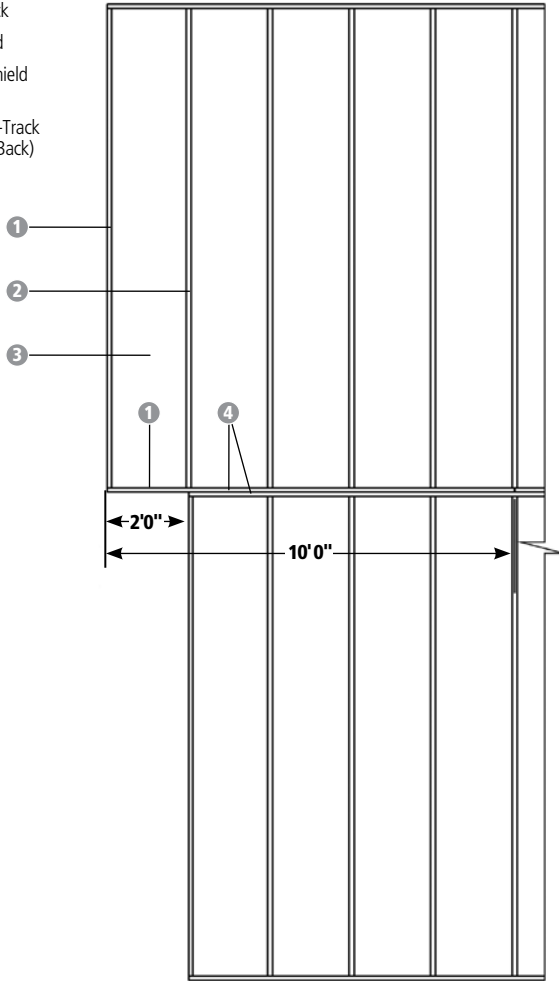
Order H-Studs and 1 in. (25.4 mm) Fire-Shield® Shaftliner according to the following:

1. Basement wall section – length equal to distance from foundation to approximately 3 in. (76.2 mm) above the first floor line.
2. Intermediate floors – length equal to the distance between floor lines.
3. Top floor or attic – length to extend to top of parapet wall or to roof intersection, depending on detail.

Area Separation Wall System

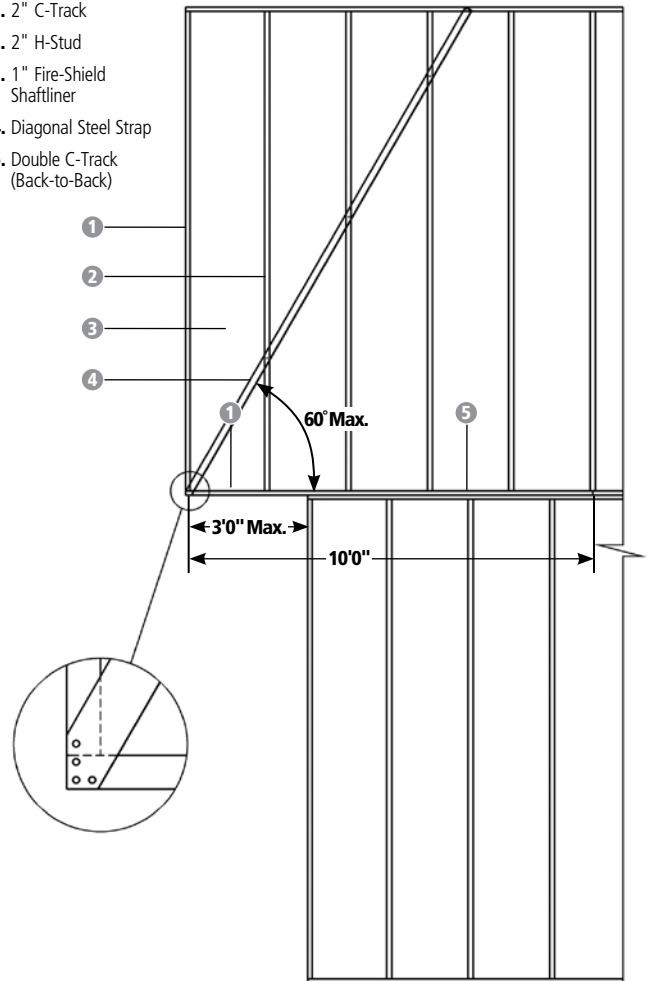
2 FT. CANTILEVER

- 1. 2" C-Track
- 2. 2" H-Stud
- 3. 1" Fire-Shield Shaftliner
- 4. Double C-Track (Back-to-Back)



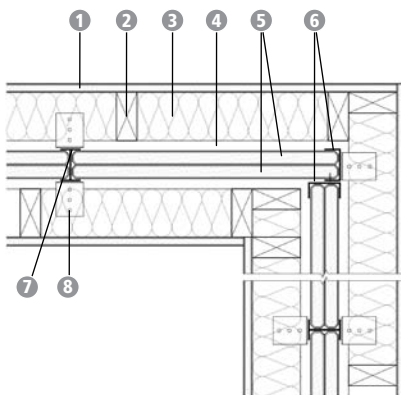
3 FT. CANTILEVER

- 1. 2" C-Track
- 2. 2" H-Stud
- 3. 1" Fire-Shield Shaftliner
- 4. Diagonal Steel Strap
- 5. Double C-Track (Back-to-Back)



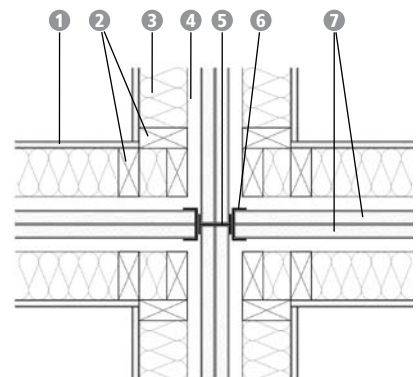
CORNER DETAIL

- 1. Gypsum Board
- 2. 2x4 Wood Stud
- 3. Insulation
- 4. Minimum 3/4" Air Space
- 5. 1" Fire-Shield Shaftliner
- 6. 2" C-Track
- 7. 2" H-Stud
- 8. ASW Clip



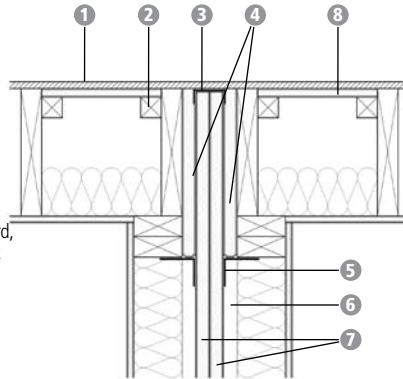
4-WAY INTERSECTION DETAIL

- 1. Gypsum Board
- 2. 2x4 Wood Stud
- 3. Insulation
- 4. Minimum 3/4" Air Space
- 5. 2" H-Stud
- 6. 2" C-Track
- 7. 1" Fire-Shield Shaftliner



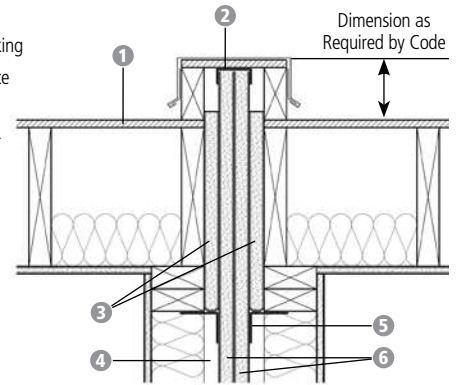
ROOF JUNCTION DETAIL

1. Roof Deck
2. 2x2 Wood Ledger
3. 2" C-Track
4. Gypsum Board or Mineral Wool Fire Blocking
5. ASW Clip
6. Minimum 3/4" Air Space
7. 1" Fire-Shield Shaftliner
8. 5/8" Fire-Shield Gypsum Board, 4' Each Side When Roof Deck is Not Constructed With Fire-Retardant Treated Wood.



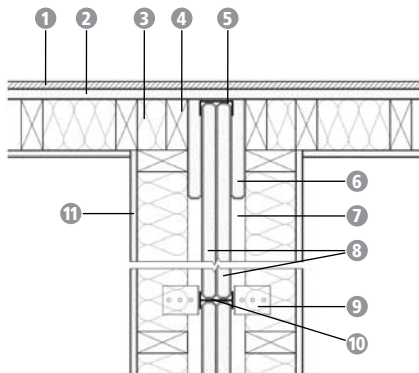
ROOF PARAPET DETAIL

1. Roof Deck
2. 2" C-Track
3. Gypsum Board or Mineral Wool Fire Blocking
4. Minimum 3/4" Air Space
5. ASW Clip
6. 1" Fire-Shield Shaftliner



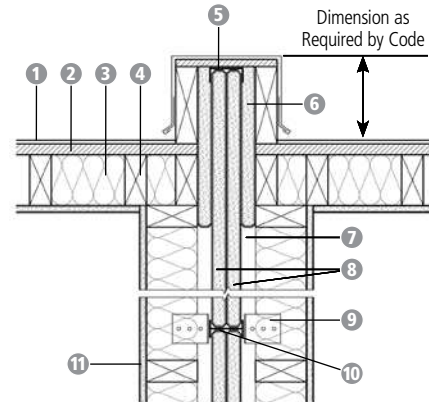
EXTERIOR WALL JUNCTION DETAIL

1. Siding
2. 5/8" Fire-Shield Gypsum Sheathing, 4' Each Side
3. Insulation
4. 2x4 Wood Stud
5. 2" C-Track
6. Gypsum Board or Mineral Wool Fire Blocking
7. Minimum 3/4" Air Space
8. 1" Fire-Shield Shaftliner
9. ASW Clip
10. 2" H-Stud
11. Gypsum Board



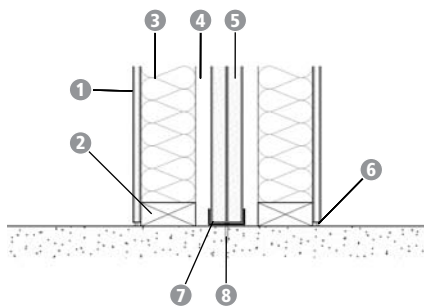
EXTERIOR WALL INTERSECTION DETAIL

1. Siding
2. 5/8" Fire-Shield Gypsum Sheathing
3. Insulation
4. 2x4 Wood Stud
5. 2" C-Track
6. Gypsum Board or Mineral Wool Fire Blocking
7. Minimum 3/4" Air Space
8. 1" Fire-Shield Shaftliner
9. ASW Clip
10. 2" H-Stud
11. Gypsum Board



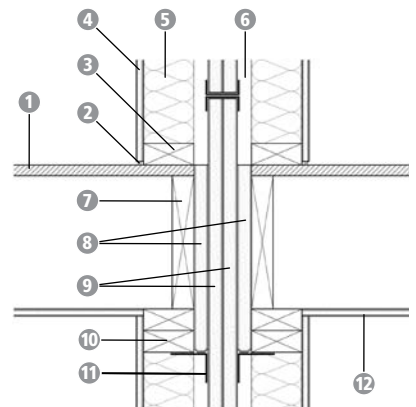
FOUNDATION DETAIL

1. Gypsum Board
2. 2x4 Wood Plate
3. Insulation
4. Minimum 3/4" Air Space
5. 1" Fire-Shield Shaftliner
6. Sealant
7. 2" C-Track
8. Fasteners 24" o.c. Max.



FLOOR INTERSECTION DETAIL

1. Subfloor
2. Sealant
3. 2" Wood Plate
4. Gypsum Board
5. Insulation
6. Minimum 3/4" Air Space
7. Rim Joist
8. Gypsum Board or Mineral Wool Fire Blocking
9. 1" Fire-Shield Shaftliner
10. 2x4 Wood Stud
11. ASW Clip
12. Ceiling



Acoustics



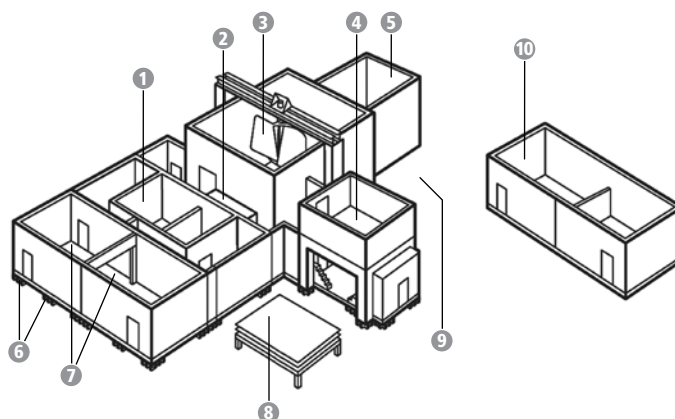
Acoustics

The NGC Testing Services acoustical laboratory features nine full-scale, fully isolated independent test chambers complete with a sophisticated control room so multiple tests can be completed concurrently. NGC Testing Services has 50-plus prebuilt, movable, floor-ceiling test assemblies and is continuously adding more custom assemblies.

Acoustical Laboratory Testing Complex

Our acoustical laboratory has been engineered to complete full-scale tests on a wide range of products.

- | | |
|--|---|
| 1. Ceiling Attenuation Chambers | 6. Springs |
| 2. Sound Console | 7. Transmission Loss Chambers |
| 3. Reverberation Chamber | 8. Test Floor Assemblies |
| 4. Floor-Ceiling Facility | 9. Test Floor Construction Area |
| 5. Pipe and Automotive Barrier Testing | 10. Hemi-Anechoic Interzone Attenuation Chamber |



THE ACOUSTICAL LAB ALSO FEATURES:

- **Partition Sound Transmission Loss Chambers:** Sound Transmission Class (STC)
- **Ceiling Attenuation Chambers:** Ceiling Attenuation Class (CAC)
- **Sound Absorption Chamber:** Noise Reduction Coefficient (NRC)
- **Sound Transmission Chamber:** Evaluating pipe-lagging systems, smaller-scale sound transmission tests and automotive barriers
- **Floor-Ceiling Chambers:** Sound Transmission Class (STC), Impact Insulation Class (IIC) and Reduction in Impact Sound Transmission (Delta IIC), with multiple test frames and overhead crane capabilities
- **Hemi-Anechoic Test Chamber:** Articulation Class (AC) and Interzone Attenuation (IA)
- **Miscellaneous:** Additional facilities for developing custom test programs to evaluate acoustical performance of a wide range of products

Test Capabilities

- ASTM E90:** Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (ISO 140, Part 3)
- ASTM E413:** Classification of Rating Sound Insulation (STC)
- ASTM E1111:** Measurement of the Interzone Attenuation of Open Office Components
- ASTM E1332:** Standard Classification for Determination of Outdoor Indoor Sound Attenuation (OITC)
- ASTM E1408:** Measures the Sound Transmission Loss of Door Panels and Door Systems
- ASTM E1414:** Standard test for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum (ISO 140, Part 9)
- ASTM C423:** Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method (ISO 354)
- ASTM E1222:** Test for the Insertion Loss of Pipe-Lagging Systems
- ASTM E492:** Test for Impact Sound Transmission through Floor-Ceiling Assemblies using the Tapping Machine
- ASTM E2179:** Test for the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors
- ASTM E989:** For Determination of Impact Transmission Class (IIC)
- ASTM E1110:** For Determination of Articulation Class (AC)
- SAE J1400:** Automotive Barriers
- ANSI S12.31/ISO 3741:** To Determine Sound Power Levels of Broad-Band Noise Sources in Reverberation Rooms
- ASTM E795:** Standard Practices for Mounting Test Specimens During Sound Absorption Tests

Designers and contractors have come under increasing pressure to reduce sound transmission between adjacent spaces in commercial and multi-family residential buildings. The demand for quiet comes from various sources. They include apartment dwellers who do not want to hear their neighbors' music or the noise from the building's community rooms; the business that wants a quiet workspace despite being next to the elevator shaft; and federal laws that mandate patient privacy in medical facilities. The solutions are the same whether it is a condominium, an office building or a hospital.

Sound waves can pass through the materials used in building assemblies and through flanking paths, as well as through hidden air passages. You can reduce sound transmission by acoustically decoupling the spaces, sealing air holes, adding mass and using sound-damping materials. It may require more than one approach.

Traditional sound attenuation strategies have proven themselves over decades of use, but the quest for quiet has also led manufacturers to develop new materials, such as sound-damping gypsum board, that make those strategies more effective than ever.

Definitions

HERTZ

Sound frequency is measured in hertz (Hz), or cycles per second – the number of sound pressure fluctuations that occur at a fixed point within a second. The human ear can hear frequencies between 20 Hz and 20,000 Hz, though the ability to hear higher frequencies degrades with age. People are most sensitive to sound in the 100 to 5,000 Hz range. (The lowest and highest notes on a piano are 27.5 and 4,186 Hz.)

DECIBELS

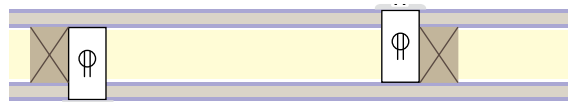
Sound intensity, or loudness, is measured in decibels (dB). A quiet whisper might register at 20 dB, normal conversation at 60 dB, and loud singing at 75 dB. The scale is logarithmic, which means that sound intensity doubles with every 10 dB increase.

Best Practices To Reduce Flanking Sound

- Stagger electrical boxes
- Stagger board joints
- Use putty pads on electrical boxes



Recommended



Not Recommended

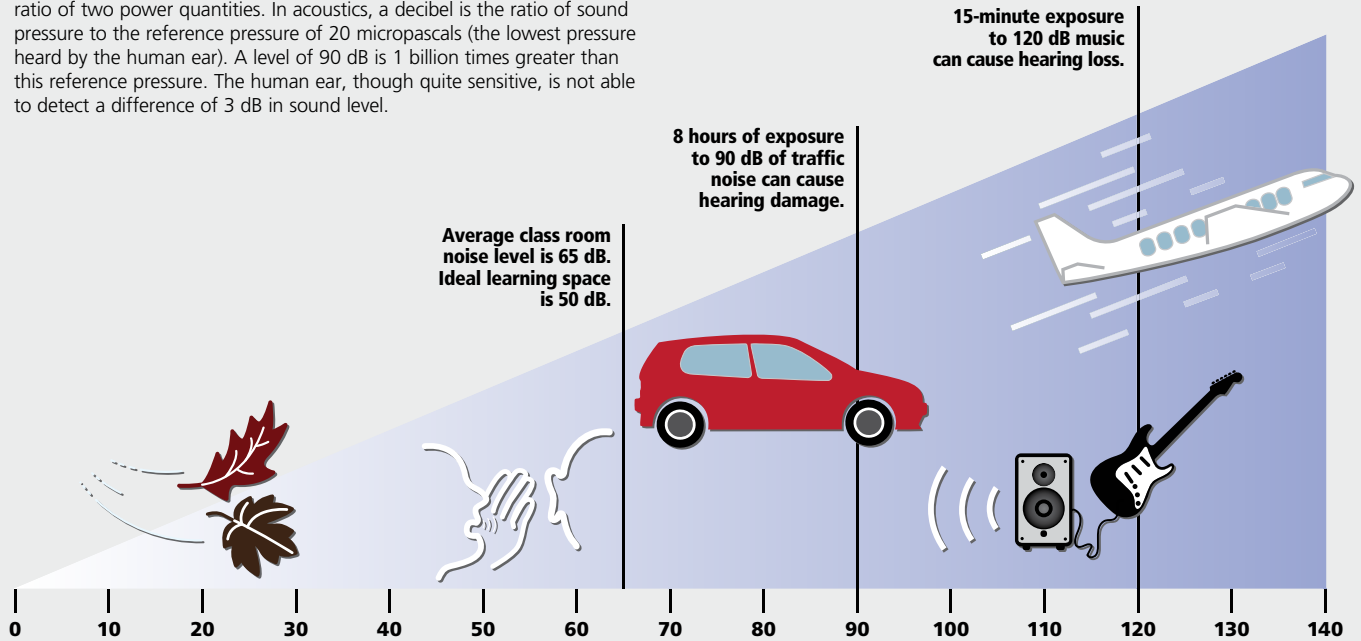
FLANKING SOUND

This is transmission of sound around building assemblies or through holes in the assembly. Flanking paths include the space above partition walls in office buildings, as well as holes in the floor and around electrical boxes. Failure to address these can derail an otherwise solid attenuation strategy.

DECIBELS (dB) OF COMMON SOUNDS

Did you Know:

"Decibel" describes how loud a sound is and it is defined as a logarithmic ratio of two power quantities. In acoustics, a decibel is the ratio of sound pressure to the reference pressure of 20 micropascals (the lowest pressure heard by the human ear). A level of 90 dB is 1 billion times greater than this reference pressure. The human ear, though quite sensitive, is not able to detect a difference of 3 dB in sound level.



Acoustical Terms

STC

Sound Transmission Class, or STC, measures how well a building material or assembly blocks airborne sound. The Sound Transmission Class is a single number rating of the effectiveness of a material or construction assembly to attenuate the transmission of airborne sound. The sound transmission loss between the source and receiving rooms are plotted on a graph by frequency and sound level in decibels. The STC curve is a sliding contour that is fitted to the performance data plotted in a manner that will allow no more than 32-decibel deficiencies below the appropriate contour. The maximum deficiency at any given frequency should not exceed 8 decibels.

Once the laboratory selects the appropriate contour, the STC is determined by the decibel value of the vertical scale at 500 Hz. The STC is expressed as a single STC number (for example, STC 38). The lab measures sound transmission loss values using ASTM E90, *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements*, to calculate the STC ratings in accordance with ASTM E413, *Classification for Rating Sound Insulation*.

There is usually an optimum STC for a given wall assembly and budget. A wood stud wall with fiberglass batt insulation and 1/2 in. (12.7 mm) gypsum board on each face will get an STC of about 38, which is fine for most interior partition walls. Party walls between apartments usually require a minimum STC of 50. Area separation walls with STC's of 60 rarely get complaints from residents. For some applications, it may be worth spending more on the assembly to achieve a higher STC rating.

Note that STC is tested at one-third octave frequencies, from 125 to 4,000 Hz. This range includes normal conversation as well as everyday sounds, such as people using pots and pans. Sound-Damping gypsum board panels, such as 5/8 in. Gold Bond® BRAND SoundBreak® XP® Gypsum Board, are extremely effective at blocking this range of sound.

Sound-Damping gypsum board will somewhat attenuate extremely low frequency sound, such as that generated by stereo subwoofers or MRI machines. These sounds can be as low as 40 Hz. Higher frequencies in the human voice and speech range are where dampened gypsum board performs best. Resilient channels may work better for those lower frequencies.

IIC

The Impact Insulation Class, or IIC, refers to the impact sound transmission performance of floor/ceiling structures. It measures how well the assembly attenuates sounds, such as footsteps and impacts. The higher the rating, the better the IIC.

NRC

Noise Reduction Coefficient, or NRC, measures sound absorption within a room by materials such as carpet, furnishings, sound isolation mats and drop-in ceiling panels. It is expressed as a value between 0 and 1. An NRC of 0.8 is considered very quiet.

CAC

Ceiling Attenuation Class, or CAC, is a single-number measure of how well ceiling tiles block sound from traveling between rooms through the ceiling plenum above a partition wall. A CAC of more than 35 is considered good, and usually requires the placement of insulation above the ceiling tiles to about 4 ft. (1,219 mm) from the wall. There is a direct relationship between STC and CAC. It is important to design a high CAC ceiling assembly to compliment a high STC wall assembly.

Sound Attenuation

When sound hits the face of a wall, the wall will vibrate like a drumhead or speaker cone, transmitting sound waves from one side to another. As mentioned above, sound can also move through airspaces or flanking paths, from one side of the wall to the other.

Ways to attenuate airborne sound include sealing the flanking paths, adding mass to the wall, decoupling the two faces, using Sound-Damping gypsum board, and adding insulation for cavity absorption.

AIR SEALING

This is an essential part of any sound attenuation approach, regardless of the frequencies being targeted. It consists of plugging the holes and gaps that create sound-flanking paths. These include gaps around electrical outlets, recessed lights, fire sprinkler heads, and doors or windows. Sealing is done with gasketing and acoustical sealant.

Not sealing the perimeter of a wall can lower its STC by as much as 10 to 15 points.

ADDING MASS

The more massive a wall, the less it will vibrate, and the less sound it will transmit. A common way to add mass is to use thicker gypsum board and/or to add more layers (5/8 in. [15.9 mm] gypsum board will transmit less sound than 1/2 in. [12.7 mm]). However, there is a law of diminishing returns when it comes to adding mass.

Remember also that a heavy, solid door will transmit less sound than a light, hollow-core door. Thermal, energy-efficient windows will also improve the STC of an exterior wall partition.

DECOUPLING

Decoupling adjacent spaces is absolutely necessary when trying to muffle with low-frequency sounds.

There are two ways to decouple a wall.

One way is to frame the wall so that each side only contacts one of the gypsum board surfaces. To do this, build two independent walls separated by airspace, or use top and bottom plates that are wider than the studs (2 ft. [610 mm] x 6 ft. [1,829 mm] plates and 2 ft. [610 mm] x 4 ft. [1,219 mm] studs, for example). Stagger the studs so that adjacent studs line up with different sides of the plate. Although staggered studs are not as effective as a double wall, they require less floor space.

Another way is to use resilient channels to separate the gypsum board from the studs. This method was originally developed to decouple the gypsum board from high-density wood studs to improve transmission loss through the wall cavity. Fasten these channels horizontally across the studs to damp the vibrations from the gypsum board. Install them over sound clips that separate the channel from the stud. The drywall screws should penetrate the channels but should not be long enough to reach the studs.

For decades, resilient channels have facilitated low-frequency sound attenuation. They work well when done right, but require near-perfect installation. They can be short-circuited by screws that penetrate the studs during construction or after completion by a tenant attaching something to the wall – a flat screen TV bracket attached to the studs, for example. Even one or two screws that penetrate the stud can undo the intended acoustical performance of the resilient channel.

REDUCING STIFFNESS

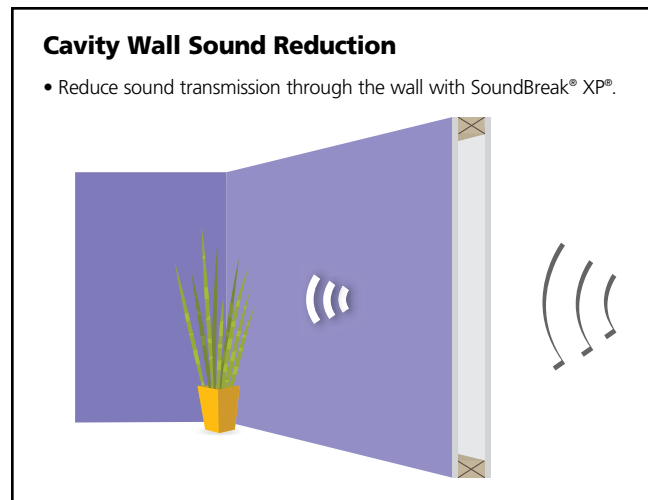
The stiffer the wall, the more it will vibrate. (Think of a drum-head: the tighter the tension, the louder the sound when you hit it.) Metal studs work better in a sound assembly than wood studs because they are less stiff. 25-gauge metal studs perform better than 20-gauge studs, and 24 in. (610 mm) o.c. framing performs better than 16 in. (406 mm) o.c. framing. Typically, there is a 3 STC reduction when moving to thicker studs and when reducing the framing spacing.

Some structural details, like seismic panels, can make walls more rigid and more likely to transmit sound. Some wood species also transmit more sound than others. For instance, Douglas Fir and Hem Fir transmit more sound than spruce or pine.

CAREFUL DETAILING OF INSULATION

The secret with insulation is not to leave gaps that can create flanking paths. Research has found that leaving just 6 percent of the wall uninsulated will reduce the insulation's sound attenuation effectiveness by 35 percent. When designing fire-rated partitions, it is important to follow the insulation guidelines of the rated assembly.

Although it is common to use R-11 fiberglass batts in sound-rated assemblies, mineral wool or sound attenuation batts may offer better performance. Spray foam does a good job at sealing air gaps, but otherwise may not provide good acoustical performance.

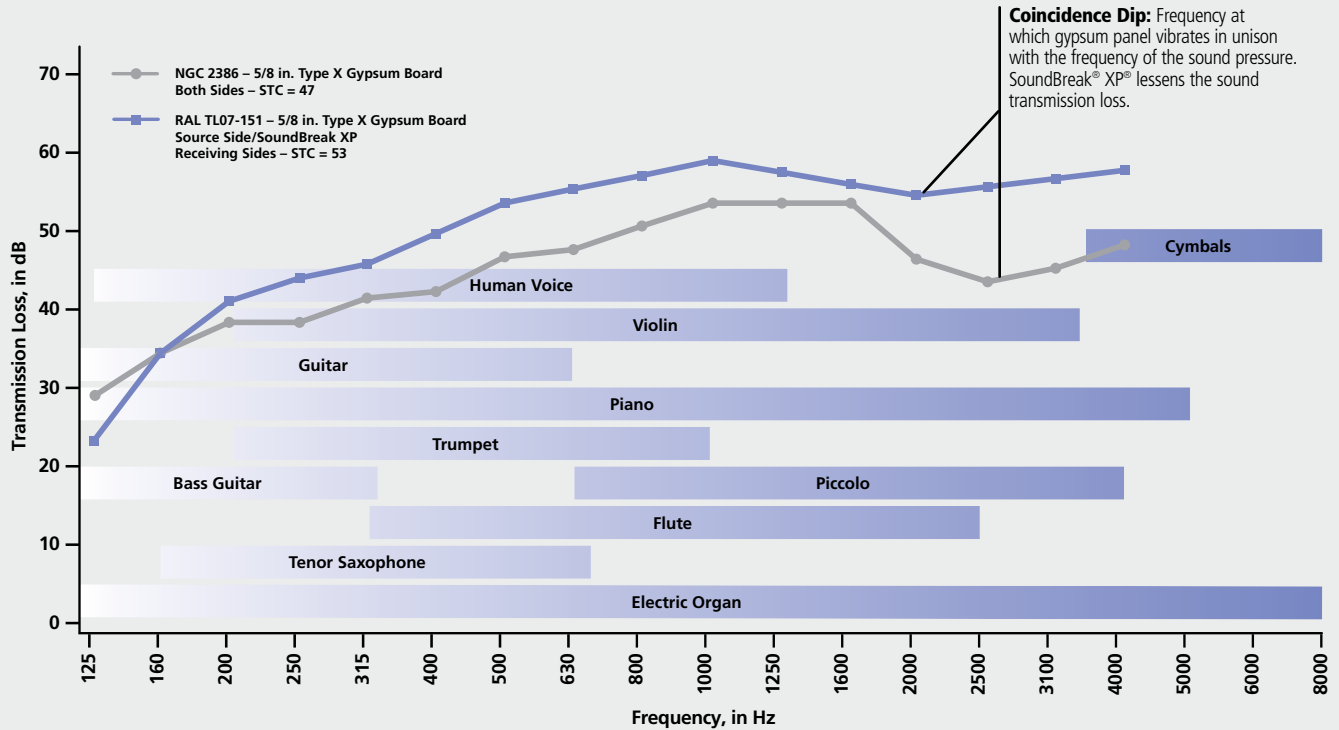


USING SOUND-DAMPING GYPSUM BOARD

Sound-Damping gypsum board uses Constrained Layer Damping. Constrained Layer Damping is like a shock absorber for sound, with a viscoelastic polymer layer at the center of the panel that absorbs and dissipates sound waves. It can reduce sound transmission by 4 decibels or more. Sound-Damping gypsum board handles, installs and finishes just like conventional gypsum board.

5/8 in. Gold Bond® BRAND SoundBreak® XP® Gypsum Board features a fire-resistant Type X core. It also resists mold growth when tested in accordance with ASTM D3273, earning a score of 10, the best possible score. Heavy, abrasion-resistant paper and a denser core provide greater resistance to surface abuse and indentation than conventional panels, when tested in accordance with ASTM C1629.

3-5/8" STEEL STUDS 24" O.C. INSULATED



Acoustics

With SoundBreak® XP®, a contractor who has been using double-stud walls with conventional gypsum board can now use standard framing with no loss in acoustical performance. Achieve a STC of 60 with either double-stud walls or a single-stud wall utilizing 5/8 in. (15.9 mm) SoundBreak XP. Standard, single steel-stud wall framing with 5/8 in. (15.9 mm) gypsum board on both faces will have an STC of around 47; using 5/8 in. (15.9 mm) SoundBreak will increase that STC to 54. Eliminating the second stud wall also adds several inches of floor area to the living space.

The designer or builder can also substitute two layers of 5/8 in. (15.9 mm) gypsum board with one layer of SoundBreak XP with no loss of performance. This can translate to big savings in areas with high labor rates.

Also use SoundBreak XP as an additional layer in UL fire-rated assemblies, adding margins to the STC rating without compromising the fire rating.

Interior Partitions

Interior partitions in office buildings usually extend from the floor to just above the ceiling tiles. While this creates an uninterrupted mechanical plenum, it also serves as a flanking path for sound to travel from one side of the partition to the other.

Drop-in ceiling panels raise the CAC number rather than block sound transmission. In addition, the ceiling grid usually includes a sizable path for airborne sound.

To solve this challenge, install 4 in. (102 mm) thick insulation batts above the ceiling next to the partition. The batts need only extend 4 ft. (1,219 mm) from the partition. Additional insulation adds only nominal sound attenuation, according to laboratory tests performed by National Gypsum.



Building Science

Overview



NGC Testing now offers a “new window” of testing for air infiltration, water penetration and uniform wind load for assemblies up to 18 feet in length by 12 feet in height.

FENESTRATION / BUILDING ENVELOPE TESTING SERVICES INCLUDE (BUT ARE NOT LIMITED TO):

ASTM E283: Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

ASTM E331: Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference

ASTM E547: Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Cyclic Static Air Pressure Difference

ASTM E330: Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

ASTM E1233: Standard Test Method of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Cyclic Air Pressure Differential

Building science is the study of how heat and moisture move through structural systems, and how to control those flows to make buildings durable, comfortable and energy efficient.

An understanding of building science will help designers and builders create efficient, comfortable and durable structures. Misunderstandings will lead to comfort and moisture problems.

This was not always the case, but there are differences between old and new structures.

For instance, many old buildings would leak without disastrous consequences. Why? The answer is Hygric Buffer Capacity, or the ability of a material to soak up and store moisture and then release it over time. The stone, brick, plaster and heavy timbers used in older buildings had an abundance of it. And because these buildings were drafty, airflow through walls made it possible for these heavy materials to release their moisture before it could cause much damage.

By contrast, the steel, glass and gypsum board used in buildings today has little to no Hygric Buffer Capacity. Walls today are tightly sealed to prevent heat loss, so they take longer to dry when they get wet. Because of this, even a small leak can cause big problems over time.

Building occupants will not tolerate mold and mildew problems, or drafty walls that leak. The solution is to choose materials that prevent these problems from happening. Choosing the right materials requires a knowledge of building science.

Basic Concepts

As with most disciplines, building science is supported by a few basic, underlying concepts. The designer or construction professional who understands the practical implications of these concepts will be able to prevent moisture problems in new buildings, and to accurately diagnose and correct them in existing buildings.

THERMAL GRADIENT "HEAT AND MOISTURE FLOW"

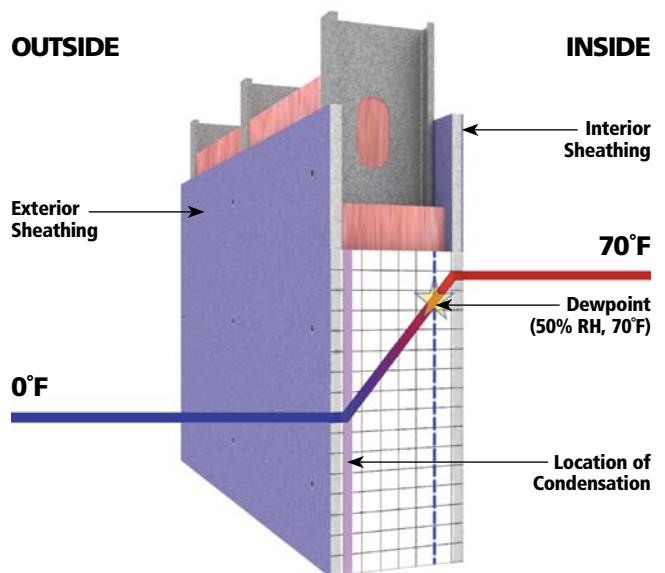
- Heat and moisture flows from warm to cold.
- Moisture also flows from moist areas to drier areas.
- Air flows from areas of higher pressure to areas of lower pressure.
- Gravity acts down.

CONDENSATION AND DEW POINT

The dew point of a body of air is the temperature at which it is saturated with water vapor. When this saturated air contacts a surface that is colder than the dew point, the water in the air will condense on that surface. Consider the familiar sight of humid air condensing on a cold water pipe, forming drops of water.

In the same way, moist air carried into a wall cavity by air leakage or diffusion will condense on the first hard surface it encounters that is colder than its dew point. This might be exterior sheathing during the winter or a cold gypsum board in an air-conditioned building during the summer. Condensation can also occur between adjacent interior spaces. For instance, condensation can occur between a party wall in a multi-family building where one apartment is kept very cool and the other very warm.

The condensing surface and dew point are not always in the same plane. For example, in a stud wall air will often reach its dew point temperature somewhere within the wall insulation, but it will not condense until it reaches one of the above surfaces.



The challenge for the designer is to utilize design strategies that select and arrange layers of materials in the wall so that dew-point conditions rarely occur.

Accomplish this by:

1. Effectively managing the temperature of the stud cavity with insulation selection and placement;
2. Managing the amount of water vapor migrating into the wall with a properly designed and placed vapor retarder; and
3. Designing and placing a proper weather resistant barrier layer.

Prevent moisture problems by carefully sealing the air to keep moist air out of the wall. Specify the sheathing and gypsum board to prevent mold and related problems if condensation does occur. For example:

- Exterior rigid insulation placed on the outside of the sheathing will keep the sheathing above the air's dew point, preventing condensation inside the wall cavity.
- Use Gold Bond® BRAND EXP® Sheathing, which also has a moisture-resistant core and a fiberglass mat surface.
- In wall systems where there is a danger of condensation occurring on the interior gypsum board, use Gold Bond® BRAND EXP® Interior Extreme® Gypsum Panels. These have a moisture-resistant core and a fiberglass facing that minimizes mold growth by denying it a food source.

The Four Control Layers

A wall has to manage the flow of moisture, air and heat through what building scientists call the four control layers:

- **The Rain Control Layer** keeps water (rain and snowmelt) out of the building.
- **The Air Control Layer** consists of air sealing to keep humidity out of the wall systems.
- **The Vapor Control Layer** prevents or allows vapor diffusion through materials, depending on the situation.
- **The Thermal Control Layer** reduces the space-conditioning load by preventing heat loss (in cold climates) or heat gain (in hot climates).

These layers are in decreasing order of importance. Do not worry about air sealing until the building is watertight, and do not worry about vapor control until the building is airtight.

HOW THE LAYERS WORK

1. Keeping water out.

The visible Rain Control Layer consists of roofing and cladding, but just as crucial to keeping water out of the building is what is behind them: the Weather Resistant Barrier (WRB). Even the best cladding will eventually leak, and the WRB serves as a control layer and as a drainage plane.

There are three main types of Weather Resistant Barriers:

- **Mechanically attached membranes** are fastened to the sheathing. The preferred method is to use a cap nailer, which drives a fastener with a plastic gasket at the head. The gasket seals the hole where the nail was driven. This type is the easiest to install, but any water that gets behind it can flow to other areas.
- **Self-adhered, or peel-and-stick membranes** have an adhesive backing that sticks to the sheathing. This type takes more work to install, but any leaks are localized. Use of a spray-on or roll-primer will help the membrane stick better.
- **Fluid-applied WRBs** are sprayed or rolled onto the sheathing. When applied over the joints and fasteners it forms an uninterrupted drainage plane. Fluid-applied WRBs are becoming more common in commercial construction.

All WRBs work best when installed under a rain screen. This consists of spacers or battens that create an airspace between the siding and the WRB. The rain screen performs best in a wind-driven rain, where the airspace reduces the pressure on the WRB, making leaks much less likely. Drainage or weep holes at the base of the rain screen give any water that does get behind the siding a way to quickly drain out.

The bottom line: a rain screen makes the building envelope more forgiving of leaks.

As an additional precaution, use a moisture-resistant sheathing panel, such as Gold Bond® BRAND EXP® Extended Exposure Sheathing. It has a mold- and moisture-resistant gypsum core and a fiberglass facing. As an added advantage, it will not soak up moisture during construction delays. It is fully compatible with all WRBs, though if using a self-adhered membrane, the installer should prime the surface first. Consult the WRB manufacturer for complete specifications and installation instructions.

2. Sealing air leaks.

Designers and builders tend to use a multi-pronged approach to air sealing.

- Air-impermeable sheathing products, such as gypsum panels, will block airflow through the field of the wall.
- Since most leaks happen at the edges of wall openings, it is necessary to carefully caulk and gasket around doors, windows and wall penetrations for mechanical systems.
- The use of spray foam wall insulation will seal cracks and gaps in hard-to-reach wall recesses.
- Covering the sheathing with a properly detailed, self-adhered membrane or a fluid-applied WRB will make the wall essentially airtight.

When it comes to air sealing, details can make a difference. If there is enough of an air pressure difference between inside and outside (remember that air flows from areas of higher pressure to areas of lower pressure), even a small hole can let ample heat and moisture flow into and out of the wall, where it could condense on the first cold surface it encounters.

3. Controlling diffusion.

Vapor Control is actually vapor diffusion control, or controlling the flow of moisture through building materials. A vapor diffusion retarder, called simply a "vapor retarder," is usually defined as a material with a permeance of 1 perm or less.

Energy and building codes regulate the placement of vapor retarders. However, designers and builders who understand a few basic principles will be better able to implement the code requirements and create more durable buildings.

Vapor retarders limit the amount of moisture that can enter a wall system through diffusion at the molecular level. Air barriers limit the amount of moisture that enters a wall system because of moist air infiltration. As a source of moisture in buildings, rainwater and mass transport of moisture through air movement are likely to be many times greater than diffusion. When air moves rapidly through a wall, it can get all the way outside before it loses enough heat for condensation to occur. However, in a wall deliberately constructed to be tighter, slow flow will probably ensure that cooling and condensation occur before the leaking air gets outside. Steel studs, masonry wall ties, gypsum board and the screws that hold it all together are all materials that may be damaged by long-term condensation. Regardless of how moisture vapor gets into the wall, once it gets in, condensation is the concern. The key is to limit condensation.

Vapor retarder placement depends on climate. Because moisture flows from warm to cold, it will be pushing outward for most of the year in a heating climate and inward for most of the year in a cooling climate. Because of this, the following guidelines apply:

- In a heating climate, put the vapor retarder on the inside wall. Try to use an exterior WRB with some permeability so that any vapor that does get into the wall will not be trapped there.
- In a cooling climate, it is a common practice to place the vapor barrier on the outside of the wall cavity. It is not a good practice to put an impermeable coating (vinyl wallpaper, for example) on the inside of an exterior wall, as doing so is asking for moisture to get trapped behind or inside the gypsum board. The result could be mold buildup. Use breathable, latex paint instead.
- Choose a WRB with a perm rating appropriate to the climate. Mechanically attached products tend to be permeable (one leading brand has a perm rating of around 50), while most self-adhered products are vapor impermeable. However, there are a couple permeable products that would be a better choice in a cold climate (where vapor pressure is pushing outward).
- Ultimately, selecting a particular type of WRB and its placement is left up to the project design team.

A break in the vapor retarder is not as problematic as a break in the air barrier. Vapor moves so much more slowly through materials than through gaps. A vapor retarder that covers 90 percent of the wall will still do 90 percent of the job.

Because diffusion, like air leakage, carries moisture into wall cavities where it can condense on cold surfaces (although the amount of moisture is reduced), use fiberglass-faced, moisture-resistant sheathing and fiberglass-faced interior gypsum board as an extra precaution.

- As an extra precaution in a cooling climate, consider using Gold Bond® BRAND EXP® Interior Extreme® Gypsum Panels, which have moisture-resistant cores and fiberglass facings that eliminate a major food source for mold.
- Where you cannot use exterior insulation to keep the sheathing temperature above the dew point in winter, use Gold Bond® BRAND EXP® Sheathing, which also has a moisture-resistant core and a fiberglass mat surface.

4. Thermal control.

Insulation and air sealing are the main strategies to keep unwanted heat energy from escaping the building during the winter and infiltrating it during the summer. In cooling-dominated climates, using a radiant barrier product can help further reduce the load on the air-conditioning system.

One such product for walls is Gold Bond® BRAND ThermalFOIL® Gypsum Board. The backside is covered with a reflective foil. When installing it over an airspace, the foil will reflect radiant heat back to the outside. The foil itself is vapor impermeable, but it is perforated to allow for vapor diffusion.

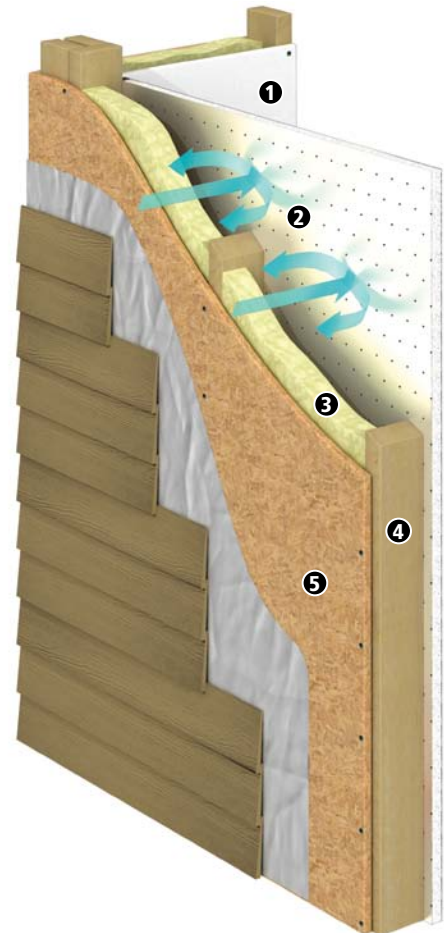
THE IMPORTANCE OF CONTINUITY

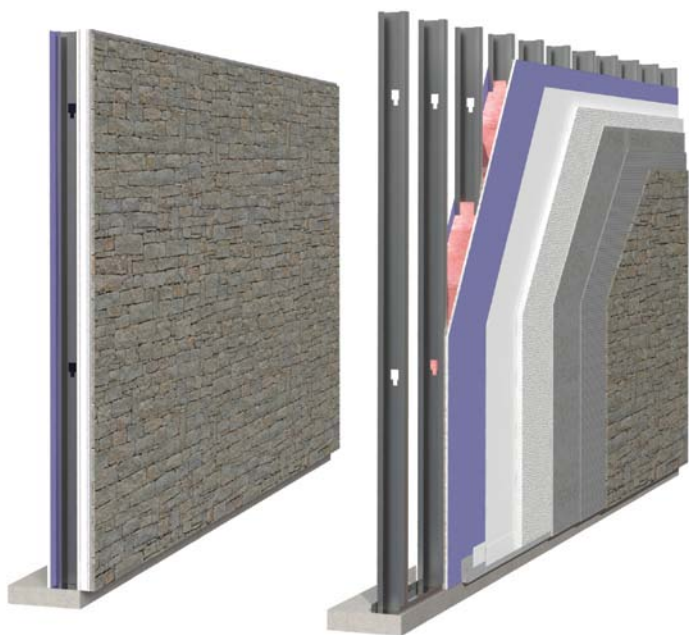
Continuity is critical in the Rain Control Layer and the Air Control Layer. Leaks occur at penetrations as well as at transitions, such as the transition between a wall and a slab or a roof. The spaces where these leaks happen are discontinuities.

The enclosure drawings should clearly indicate the materials and components that serve as the primary air barrier for each enclosure assembly. The drawings should include transition components, like flashings or sealants. As a general rule, if the designer cannot use a pencil to trace the air barrier on the design documents without having to raise the pencil from the drawings, then it is not considered continuous.

ThermalFOIL® Installation

1. 1/2" ThermalFOIL®
2. Reflective Air Space
3. 2 lb. Closed Cell Spray Foam
4. 2x4 Studs, 16" o.c.
5. OSB or Plywood





COMMERCIAL BUILDING ENCLOSURE

The Building Science Corporation in Westford, Massachusetts, developed “The Perfect Wall.” It addresses the most common control layer weaknesses seen in conventional wall systems. The Perfect Wall is an environmental separator – it has to keep the outside out and the inside in. To do this, the wall assembly must control rain, air, vapor and heat.

It places all four control layers listed on page 377 on the outside of the framing. This includes:

- A rain screen cladding system.
- An exterior Weather Resistant Barrier (water, air and vapor).
- Rigid exterior insulation.

Proponents claim this will be more moisture-resistant than any other wall design.

The rain screen between the cladding and insulation creates an airspace that allows any water that seeps behind the siding a way to drain out. When done correctly, water should never reach the WRB or the sheathing.

The Perfect Wall earns its keep in heating and cooling climates, but in different ways.

In a heating climate in winter, the first cold surface hit by warm, humid air flowing through the wall will be the siding rather than the sheathing. If it condenses, the rain screen will give it a way to drain out. That is very different from a typical wall, where air condensing on the inside of the sheathing can wet the insulation installed between the studs.

In a cooling climate in summer, humid air pushing into the wall from outside will be able to reach the conditioned space, where it will be dried out by the air-conditioning system – provided that the interior wall is not covered with an impermeable finish.

In a wall with wood studs, place additional cavity insulation between the studs. In a wall framed with metal studs, or one built with concrete masonry units, all the insulation should ideally be outbound of the sheathing.

In Summary

Knowledge of building science helps the designer and builder create more efficient, comfortable and durable buildings through intelligent management of the four primary control layers.

National Gypsum offers the following materials to aid in that effort:

- Gold Bond® BRAND EXP® Interior Extreme® Gypsum Panels
- Gold Bond® BRAND EXP® Sheathing
- Gold Bond® BRAND ThermalFOIL® Gypsum Board



Frequently Asked Questions And Solutions

Conditions	Probable Cause	Preventive Action	Corrective Action
Joint Problems			
Tape Photographing	Slow drying of finishing coats. Too much compound under tape. Joint compound too thin.	Correct drying conditions. Embed tape properly. Use joint compound thicker. Use ProForm® BRAND Joint Tape.	Sand down the tape outline and seal. Refloat if necessary before decoration. Prevent finish coat moisture from re-wetting the tape by applying a thinner coat for fast drying.
Starved Joint	Compound applied too thin in viscosity and thickness. Too little compound over joint. Excessive sanding.	Use finishing compound at heavier viscosity and proper thickness of coats. Do not over-sand.	Allow to thoroughly dry, then apply an additional coat of topping or joint compound.
High Joint	Excess joint compound under the tape. Excess joint compound over the tape and improper feathering. Poor framing. Improper gypsum board application. Improper sanding. Use of compound too heavy.	Proper thickness of compounds for taping and finishing. Feather finishing coats wider than previous coats. Correct poor framing and improper wallboard application to ensure proper alignment. Sand properly.	Sand joint to near flush without sanding into tape. Apply a wider finishing coat properly feathered, if necessary. Apply a second finishing coat or skim coat.
Beading/Ridging	Lumber expansion and contraction. Improper heating and ventilation. Cold weather with high humidity. Improper application of gypsum board. Excess compound over joints and needless wide joints. Rough or poorly cut butt joint.	Use ProForm® BRAND Quick Set™ System to minimize beading or ridging. Alternatives include: double-layer lamination system.	Allow one full heating cycle – six months to one year – before repairing, then sand ridge flush and apply one or more finishing coats of joint or topping compound. Use critical lighting to determine if bead is eliminated prior to decoration.
Cracking Problems			
Edge Cracking	Fast drying with low humidity. Rapid temperature and humidity changes. Improper application. Joint compound too thin or too heavy under tape. Edges of tape too thick. Excessive wet expansion and contraction of joint tape. Poor bond (see Bond Failure).	Correct drying conditions to avoid rapid surface drying. Keep temperatures and humidity as consistent as possible by controlling ventilation. Use roller to wet joints with water prior to each joint treatment operation. Use ProForm® BRAND Quick Set™ Setting Compounds or ProForm® BRAND Ready Mix Joint Compounds and tape. Embed tape properly, avoiding excessive compound under tape (maximum of 1/32" thickness of compound under edges of tape) and wipe down tape immediately. Use job prevention for bond problems.	Correct drying conditions during repairs and painting when edge cracks appear before second finishing coat. Brush one or two coats of good quality flat latex paint about 4" wide over tape, then apply finishing coat. When cracks appear after finishing coat or painting, apply two or more coats of good quality flat latex paint over cracks that are flush with surface to bridge them before decoration. Where cracks are curled, groove out cracks and apply one coat of flat latex paint. Once dry, fill with ProForm® BRAND Quick Set™ Setting Compounds or ProForm® BRAND Ready Mix Joint Compounds.

Frequently Asked Questions And Solutions (cont.)

Conditions	Probable Cause	Preventive Action	Corrective Action
Cracking Problems (cont.)			
Cracking	Adverse drying conditions. High temperatures and low humidity and drafts or low temperature and high humidity. Joint or topping compound applied in excessive thickness.	Fill all wide gypsum board joints with ProForm® BRAND Quick Set™ Setting Compounds. Correct drying conditions. Apply thinner layers of joint or topping compound. Allow thorough drying between layers.	Additional coats of joint or topping compound will fill the cracks without reoccurrence.
Inside Corner Cracking	Joint too wide or not filled. Improper drying between coats. Excess thickness of compound over tape at apex of corner. Extremely fast or slow drying conditions. Applying compound to both sides of inside corner at same time.	Fill wide joints with ProForm® BRAND Quick Set™ Setting Compounds prior to taping. Embed tape properly, allow to dry. Apply compound to one side and allow to dry, then treat other side.	Fill wide cracks with joint or topping compound. For hairline cracks, run a pointed object (10D or 16D nail) along the apex of corner with adequate pressure to close crack.
Bond Failure	Improper heating and drying conditions. Old stock. Excessive thinning of compounds. Too little compound under tape. Unbuffered joint tape. Oily surfaces. Mixing with dirty or excessively cold water. Compound too dry before embedding tape.	Proper drying conditions. Mix in clean container with clean tap water. Rotate stocks. Avoid over-thinning of compound and removing too much compound from under tape. Use ProForm® BRAND Quick Set™ Setting Compounds or ProForm® BRAND Ready Mix Joint Compounds and tape.	Remove all loose joint tape and compounds by sanding or scraping and repair as necessary.
Discoloration, Banding or Dirt Collection	Dirt collection may occur more rapidly over nail or screw heads, nailing members or over voids in insulation due to a greater heat loss and condensation.	Two-layer laminated system. Foil-backed gypsum board. Proper insulation. Eliminate protrusion of nails through wood furring on exterior walls and ceiling.	Wash or repaint. Decrease dust particles in the air by filtration in forced air heating and exhaust fans in kitchen.
Variation in Surface Textures	Failure to sand properly, causing scratching of compound and scuffing of the wallboard paper. No primer or poor quality primer. Over-thinning of primer. Spray application of primer.	Use finer grit sandpaper with care to prevent raising nap of paper. Use wet sanding method. Prime all surfaces with a quality drywall primer as directed. Brush or roll primer. Back roll after spray application.	When condition exists after painting, sand as necessary and prime before finish coat of paint.
Joint Darkening or Lightening	Joints not dry when painted. Painting under humid conditions. Painting with low-grade latex and paints. Suction variations of joint compounds.	Allow joints to thoroughly dry. Avoid painting under extremely high humidity conditions. Use ProForm® BRAND products. Prime entire surface with quality drywall primer prior to applying texture finish as finish decoration. Apply two coats of quality latex paint.	Allow thorough drying. Select test area where condition is most prevalent and repaint with good quality sealing latex primer. If condition persists, apply a good quality primer/sealer, then repaint.

Conditions	Probable Cause	Preventive Action	Corrective Action
Cracking Problems (cont.)			
Joint Yellowing	Slow drying. Fumes from partially combusted gases. Painting over wet joints and high-alkaline material.	Use permanent heat in cold weather. Avoid painting over wet joints. Avoid painting in high humidity conditions.	Apply a good quality primer/sealer, then repaint.
Nail Problems			
Nail Pops	Framing out of alignment. Lumber shrinkage. Improper gypsum board application. Improper heating and ventilation.	Provide heat and ventilation to dry framing lumber. Align framing lumber. Nail center of gypsum board first. Hold gypsum board firm to nailing member when nailing. Use proper nails. Check all nails before nail spotting. Systems recommended to reduce or eliminate nail pops include: double-layer lamination, double-nailing system, floating angle system, adhesive nail-on system and screw application.	When nail pops occur before decoration, repair immediately. If problem occurs after decoration, repair after framing lumber is dry (usually one heating cycle). To repair, drive a GWB-54 nail 1-1/2" (38.1 mm) from each side of popped nail while holding gypsum board firm to the nailing member. Countersink popped nail, remove loose joint compound, then apply finishing coats of joint or topping compound.
Depressed Nails	Framing out of alignment. Lumber expansion due to moisture absorption. Improper gypsum board application. Too few nails, improper furring, structural movement. Nails dimpled too deeply.	Align framing lumber. Allow dry lumber to become acclimated. Correct gypsum board application as described for nail pops. Use proper nail spacing. When furring, use no less than 2x2. Use systems recommended to reduce or eliminate nail pops. Avoid fracturing paper when driving nails.	Repair as described for nail pops, unless most nails are depressed and gypsum board is loose (usually ceilings). Re-nail entire surface using proper spacing. Dimple depressed nails and apply finishing coats of joint or topping compound.
Texturing Problems			
Lumping	Too much water added to initial mix. Adding water to powder.	Add powder to water using less water than initially specified. After mix is smooth and lump-free, add remaining water to adjust mix to a workable viscosity.	Add powder until mix thickens. Continue mixing until lumps disappear.
Mix Too Thin	Too much water added in initial mix or inadequate soaking time in cold water.	Use recommended water requirements in initial mix. Allow mixed ingredients to soak for several minutes, when necessary, if using cold water.	Add powder until mix thickens.
Aggregate Fallout (During Spraying)	Spray gun too close to surface and/or excessive air pressure at nozzle.	Hold spray gun at proper distance and angle from surface to prevent aggregate fallout.	Lower air pressure. Hold spray gun at proper distance and angle from surface to prevent excessive fallout.

Frequently Asked Questions And Solutions (cont.)

Conditions	Probable Cause	Preventive Action	Corrective Action
Texturing Problems (cont.)			
Aggregate Floatout	Too much water added during initial mix and/or inadequate mixing after initial water is added.	Use recommended water requirements and make sure water is properly blended into mix.	Add powder until mix thickens.
Poor Coverage	Mix too thick for proper spray viscosity and/or improper application, such as spraying too slow, overloading surface with spray material and using incorrect spray pressures.	Use recommended water volume for mixing to ensure sprayable viscosity. Use proper spray application to ensure uniform dispersion of aggregate and proper coverage.	Carefully add water to mix. Use proper spray techniques. Adjust spray pressure.
Poor Hide	Over-thinned mix causing a reduction in both wet and dry hide. Mix too thick causing poor atomization resulting in surface show-through. Improper application/over-extending spray. Selecting improper spray pressures. No primer used prior to texturing.	Use recommended water volume for mixing to ensure sprayable viscosity. Use proper spray application to ensure uniform dispersion of aggregate and proper coverage. Use a good quality drywall primer.	Add powder or water depending on mix consistency. Adjust spray pressure. Use proper spray technique. Apply finished paint over textured surface.
Poor Bond Or Hardness	Over-thinned mix results in over-dilution of latex binder in spray texture. Improper surface preparation. Contamination with other materials.	Use recommended water volume for mixing. Remove all loose material, dust, grease, oil and prime surface with a quality drywall primer. Do not intermix with other products. Always use a clean mixing container and clean water.	Scrape down surface and repeat application following recommendations under "Preventive Action."
Clogged Spray Equipment	Contamination of mix with oversized particles can sometimes clog spray nozzle orifice.	Prevent contamination during mixing and spraying. Use correct nozzle size for aggregate being sprayed.	Check mix for contamination and/or oversized particles. If contaminated, screen out contaminants or discard and remix new batch.
Material Pumping Problems	Mixed spray material too heavy. Pump equipment old and worn. Equipment improper size for spray product.	Use recommended water volume for mixing. Make sure proper equipment is being used and that spray machine is in good repair.	Thin mix if too heavy for pumping.
Unsatisfactory Spray Pattern	Worn spray equipment (either fluid or spray nozzle) and/or improper air pressure. Improper spray technique and/or poor spray mix consistency.	Inspect spray nozzles to ensure good working condition. Replace any worn parts.	Improve spraying technique. Add recommended water volume to ensure proper spraying consistency.

Conditions	Probable Cause	Preventive Action	Corrective Action
Texturing Problems (cont.)			
Texture Buildup	Spraying or texturing over surfaces with major differences in surface porosity or suction (improperly primed). Thin texture will tend to build up over high suction surfaces.	Prime entire surface with a good quality drywall primer. Follow mixing instructions.	Remove all texture from sprayed surface and reapply following instructions under "Preventive Action."
Joint Show-Through	Over-extended and over-thinned primer won't adequately hide the contrast between finished joints and gypsum board paper.	Use recommended water volume when mixing texture and apply at recommended coverage rates. Prime surface with a good quality drywall primer prior to application of spray texture.	Allow spray to thoroughly dry, then prime with a quality drywall primer and re-spray or paint textured surface.
Joint Shows Through As White Band	Spraying over unprimed surfaces during cool, humid, slow drying conditions. Joint stays white, water solubles in gypsum board paper bleed through.	Prime surface with a good quality drywall primer before applying texture.	Allow spray to thoroughly dry, then paint textured surface.
Shrinkage Problems			
Shrinkage	Compound used too thin or watery. Applied too soon after mixing. Improper drying between coats. Painting before joints are thoroughly dry. Too deep fills in one coat. Slow drying.	Use compound at heaviest workable consistency. Allow to stand before using. Allow thorough drying of compound between coats and prior to painting. Apply additional coats on deep fills. Provide proper drying.	Allow to thoroughly dry and recoat. Provide proper drying.
Delayed Shrinkage	Improper drying conditions. Painting before compound and gypsum board are thoroughly dry. Under high humidity, slow drying conditions, joints and gypsum board may hold moisture for weeks.	Provide proper drying conditions. Allow complete drying before each coat of joint treatment and before repainting.	Allow to thoroughly dry and recoat affected joints.
Misinterpreted Shrinkage	Improper gypsum board application including: nails dimpled too deep, fractured core of gypsum board, fractured face paper, corner bead applied improperly, tape photographing.	Less dimple of nails. Press wall-board snug to nailing member before dimpling nail. Use Gold Bond® BRAND Gypsum Board. Re-nail where necessary. Use ProForm® BRAND Quick Set™ Compound for at least the first coat on nails and corner bead. (See "Tape Photographing.")	Nails: re-nail where necessary. Cut out any loose areas and fill with two or more coats of Quick Set™ or regular joint compound. Recoat corner bead.

Frequently Asked Questions And Solutions (cont.)

Conditions	Probable Cause	Preventive Action	Corrective Action
Miscellaneous Problems			
Pock Marking	Entrapment of air in the mixed compound and in application. Over-mixing of compound. Compound mixed too thin. Heavy fills. Improper application technique. Compound applied too loosely.	Mix compound as quickly as possible and let stand until binder is in solution before remixing. Mechanical mixers should have 500 RPM maximum. Use heavier mix. Make additional passes over joints and bead with hand or mechanical tools. File trowel edges square regularly to avoid entrapment in application. Apply compound thinly and use more pressure on finish coat.	Remove sanding dust that may collect in "pocks" prior to painting and refloat joint as necessary. When condition exists after painting, float with compound and repaint.
Nail Pops/Screw Buttons	Framing out of alignment. Lumber shrinkage due to exposure to first heat cycle. Lumber may shrink 3% to 4% (.105 to .140 in.) on a standard 2x4 wood stud causing nails to become loose and exposed as nail pops. Improper gypsum board application. Improper heating and ventilation. Use of low-VOC water-based drywall adhesives.	Provide heat and ventilation to dry framing lumber. Align framing lumber, discard twisted studs. Align steel studs with flanges facing the same direction. Attach panels in the direction opposite of the stud web direction (open area of stud first). Fasten center of gypsum board first. Hold gypsum board firm to framing member when fastening. Use proper fasteners. Check all nails before nail spotting. Systems recommended to reduce nail pops/screw buttons include: double-layer lamination, double-nailing system, floating angle system, adhesive nail-on system and screw application. Allow low-VOC water-based adhesives to fully cure before decoration or use non-water-based drywall adhesives.	When nail pops occur before decoration, repair immediately. If problem occurs after decoration, repair after framing lumber is dry (usually one heating cycle). To repair, drive a drywall nail 1-1/2" from each side of popped nail while holding gypsum board firm to the nailing member. Countersink popped nail, remove loose joint compound, then apply finishing coats of joint or topping compound.
Depressed Nails	Framing out of alignment. Lumber expansion due to moisture absorption. Improper gypsum board application. Too few nails, structural movement. Nails dimpled too deeply.	Align framing lumber. Allow dry lumber to become acclimated. Correct gypsum board application as described for nail pops. Use proper nail spacing. Use systems recommended to reduce or eliminate nail pops. Avoid fracturing paper when driving nails.	Repair as described for nail pops, unless most nails are depressed and gypsum board is loose (usually ceilings). Re-nail entire surface using proper spacing. Dimple depressed nails and apply finishing coats of joint or topping compound.

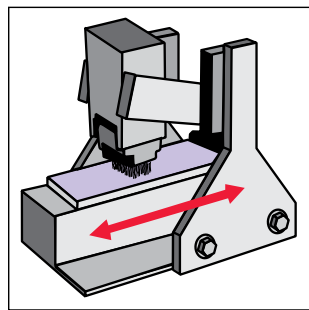
Conditions	Probable Cause	Preventive Action	Corrective Action
Misc. Problems (cont.)			
Paper Delamination	Environmental conditions, water damage, stocking.	Gypsum board must be protected from the elements, moisture will weaken the paper to gypsum bond. If delamination is minor, paper may be peeled back to area that bond begins and treat area with joint compound (ready mix or setting type).	Protect gypsum board from inclement weather and moisture. Board should not be installed in areas not enclosed. In pre-rock conditions, use a glass mat faced product, such as EXP® Interior Extreme or EXP® Sheathing.
Mold	High moisture or humid areas.	Keep gypsum board dry, avoid high humidity areas and keep area as clean as possible. Ordinary household products will not eliminate most molds on gypsum board and should not be used.	When mold growth is visible, do not apply board to wall or ceiling. In conditions with mold, contact a mold remediation firm.
Ceiling Sag	Moisture on back of gypsum board, excessive insulation weight on back of board, wrong board thickness for frame spacing, vapor barrier installed incorrectly.	Inspect for moisture leaks in roof/ceiling areas, follow guidelines for weight limits of insulation on gypsum board, use proper board thickness, follow vapor barrier recommendations.	If board sags: replace board or remove insulation load. Replace wet board.

Abuse And Impact Test Results For ASTM C1629

Abuse And Impact Test Results

RECOMMENDED CLASSIFICATION LEVELS FOR COMPLIANCE				
Test/Classification Level	Gold Bond Hi-Abuse XP Gypsum Board	Gold Bond EXP Interior Extreme AR Gypsum Board	Gold Bond Hi-Impact XP Gypsum Board	Gold Bond EXP Interior Extreme IR Gypsum Board
ASTM D4977 – Surface Abrasion	3	3	3	3
ASTM D5420 – Surface Indentation	1	1	1	1
ASTM E695 – Soft-Body Impact	2	2	3	3
Annex A1 – Hard-Body Impact	1*	1*	3	2

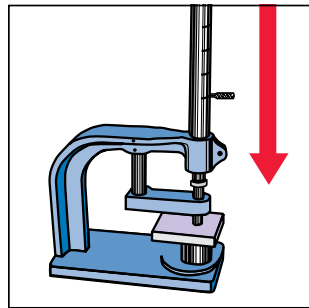
*Abuse products are not recommended for areas prone to cavity penetration.



SURFACE ABRASION (Modified ASTM D4977)

This test measures the ability of a gypsum panel surface to resist scratches and scuffs by subjecting the panel to 50 back and forth cycles with a wire brush. The depth of the abrasion is measured. The test was originally developed to test granule adhesion to mineral surfaced roofing, and was modified by adding 25 pounds of additional weight to the wire brush.

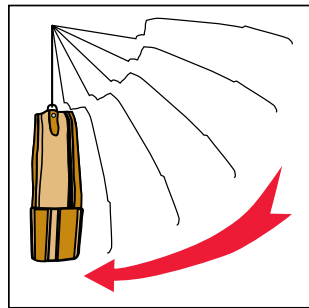
TEST RESULTS – Per ASTM D4977	
Classification Level	Abraded Depth Maximum
1	0.126" (3.2 mm)
2	0.059" (1.5 mm)
3	0.010" (0.3 mm)



SURFACE INDENTATION (ASTM D5420 – Gardner Impact Test)

This test measures the ability of a gypsum panel to resist dents by a small hard object, by raising and dropping a hemispherical rod onto the gypsum panel. The depth of the indentation is measured. The original test was developed to test flat, rigid sheets of plastic.

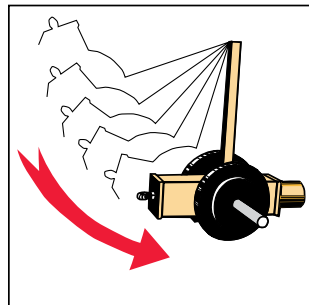
TEST RESULTS – Per ASTM D5420	
Classification Level	Indentation Maximum
1	0.150" (3.8 mm)
2	0.100" (2.5 mm)
3	0.050" (1.3 mm)



SINGLE DROP SOFT-BODY IMPACT (Modified ASTM E695)

This test measures the ability of a gypsum panel to withstand a single impact of a heavy soft object. This test is conducted by swinging a leather bag loaded with steel pellets into the panel. When the panel breaks, the height of the drop and weight of the bag are used to calculate the foot-pound measurement required to break the panel. The test was originally developed to measure relative resistance of wall, floor, and roof construction to impact loading.

TEST RESULTS – Per ASTM E695	
Classification Level	Soft-Body Minimum
1	90 ft.-lbs. (112 J)
2	195 ft.-lbs. (265 J)
3	300 ft.-lbs. (408 J)



HARD-BODY IMPACT (Annex A1)

This test measures the ability of a gypsum panel to withstand the impact of a hard object, such as a hammer or heel of a boot. A panel is impacted with 2-3/4" steel cylinder mounted to a ram. Weights are added to the ram and the panel is impacted one time. The maximum amount of impact force the panel can withstand without breaching the stud cavity is reported. This is a new test proposed by manufacturers of high-performance panels.

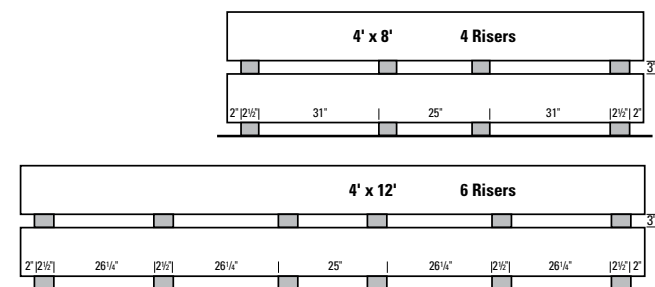
TEST RESULTS – Per Annex A1	
Classification Level	Hard-Body Minimum
1	50 ft.-lbs. (68 J)
2	100 ft.-lbs. (136 J)
3	150 ft.-lbs. (204 J)

Tests witnessed by H.P. White Laboratory, Inc.

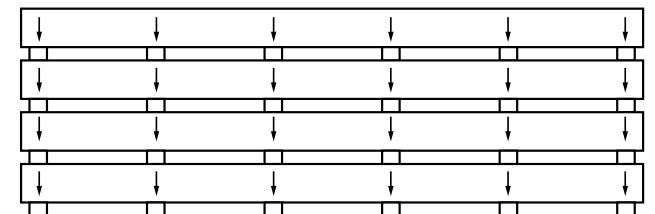
Gypsum Board Handling, Storage And Project Conditions

- Use caution and care when moving gypsum board; the panels are heavy and must be moved using proper lifting techniques or equipment.
- Protect the board edges, corners and ends during transport or in high-traffic areas.
- Storage temperatures should not exceed 125°F (52°C).
- Store panels flat and level. Storing them upright could damage the edges, and creates a danger to employees.
- When storing or stacking multiple layers, use risers or spacers between layers.
- Risers must be vertically aligned from top to bottom to prevent sagging or bowing.

CORRECT RISER SPACING

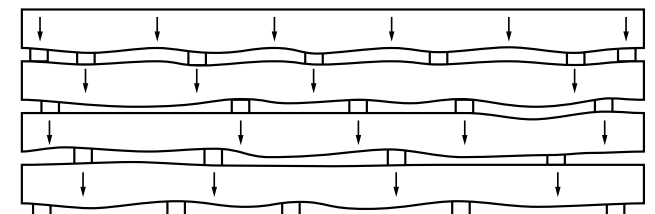


CORRECT METHOD OF PLACING RISERS



Note that all risers are placed in proper vertical alignment so each tier is evenly supported. Arrows indicate pressure.

INCORRECT METHOD OF PLACING RISERS



Cumulative pressure on unsupported lower units causes gypsum board to sag. Risers are not spaced evenly or in proper vertical alignment.

HANDLING AND PROJECT CONDITIONS

- Avoid water exposure during shipping, handling, storage and installation, and after installation of gypsum board to avoid the formation of mold or mildew.
 - Remove non-breathable shipping wrap material upon receiving and storing gypsum board.
 - Store gypsum board off the ground and under cover. Use sufficient supports extending under the entire length of gypsum board to prevent sagging.
 - Keep gypsum board dry to minimize the potential for mold growth. Take adequate care while transporting, storing, applying and maintaining gypsum board. For additional information, refer to GA-238, which is available at gypsum.org under the "Download Free Gypsum Association Publications" section.
 - Keep gypsum board protected from the elements and maintained in good condition prior to and following installation. Stack panels flat, with care taken to prevent sagging or damage to edges, ends or surfaces.
 - Reject gypsum board with visible signs of mold growth. Do not apply gypsum board over other building materials where conditions exist that are favorable to mold growth.
 - Do not exceed 95°F (35°C) when a temporary heat source is used.
 - Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.
 - Refer to GA-801 for complete handling and storage instructions.
- ## MAINTENANCE FOLLOWING APPLICATION
- Maintain essential elements of sound weather-tight building envelope, including roofing, joint sealants, windows and flashings.
 - Take immediate and appropriate remediation measures as soon as water leaks or condensation sources are identified.
 - Perform routine cleaning and maintenance operations using methods that prevent moisture saturation of gypsum board.

Limited Warranties And Remedies, Additional Sources Of Information

LIMITED WARRANTY AND REMEDIES

Products manufactured and sold by National Gypsum Company are warranted by National Gypsum Company to its customers to be free from defects in materials and workmanship at the time of shipment. THIS EXPRESS WARRANTY IS THE ONLY WARRANTY APPLICABLE TO SUCH PRODUCTS, AND IS IN LIEU OF AND EXCLUDES ALL OTHER EXPRESS ORAL OR WRITTEN WARRANTIES AND ALL IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

National Gypsum Company will not be liable for any incidental, indirect or consequential losses, damages or expenses. The customer's exclusive remedy for any type of claim or action for defective products will be limited to the replacement of the products (in the form originally shipped) or, at National Gypsum's option, to a payment or credit not greater than the original purchase price of the products.

National Gypsum Company will not be liable for products claimed to be defective where the defect resulted from causes not within National Gypsum's control, or which arose or occurred after shipment, including but not limited to accidents, misuse, mishandling, improper installation, contamination or adulteration by other materials or goods, or abnormal conditions of temperature, moisture, dirt or corrosive matter.

Any claim that products sold by National Gypsum Company were defective or otherwise did not conform to the contract of sale is waived unless the customer submits it in writing to National Gypsum within thirty (30) days from the date the customer discovered or should have discovered the defect or nonconformance. No legal action or proceeding complaining of goods sold by National Gypsum may be brought by the customer more than one year after the date the customer discovered or should have discovered the defect or problem of which it complains.

MOLD AND MILDEW RESISTANCE

Gold Bond® BRAND XP® Gypsum Board products with Sporgard™ were designed to provide extra protection against mold and mildew compared to standard wallboard products. When tested by an independent laboratory, XP Gypsum Board products with Sporgard received the highest possible ratings on ASTM G21 and D3273.

Gold Bond® BRAND EXP® Panels were designed to provide extra protection against mold and mildew compared to standard gypsum board products. When tested by an independent lab per ASTM D 3273 ("Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber"), EXP Panels achieved a score of 10, the best possible score for this test.

No material can be considered "mold-proof," nor is it certain that any material will resist mold or mildew indefinitely. When used in conjunction with good design, handling and construction practices, XP and EXP products can provide increased mold resistance versus standard gypsum board products. As with any building material, avoiding water exposure during handling, storage and installation, and after installation is complete, is the best way to avoid the formation of mold or mildew.

ADDITIONAL SOURCES OF INFORMATION

The following websites provide information and recommendations for treating mold growth; other sites also provide similar suggestions.

- California Indoor Air Quality Program: cdph.ca.gov/programs/iaq/Pages/default.aspx
- Federal Emergency Management Agency: fema.gov
- New York City Department of Health: www1.nyc.gov/assets/doh/downloads/pdf/epi/epi-mold-guidelines.pdf
- U.S. Environmental Protection Agency: epa.gov/mold/

Customer Sales Contact Information And Trademark Information

CUSTOMER SERVICE SALES AREAS

Atlantic Area

Phone: (800) 237-9167

Fax: (877) 252-0430

Central Area

Phone: (800) 252-1065

Fax: (866) 232-0440

Gulf Area

Phone: (800) 343-4893

Fax: (866) 482-8940

Midwest Area

Phone: (800) 323-1447

Fax: (866) 692-8590

Northeast Area

Phone: (800) 253-3161

Fax: (866) 632-1480

Southeast Area

Phone: (800) 548-9394

Fax: (866) 732-1990

Southwest Area

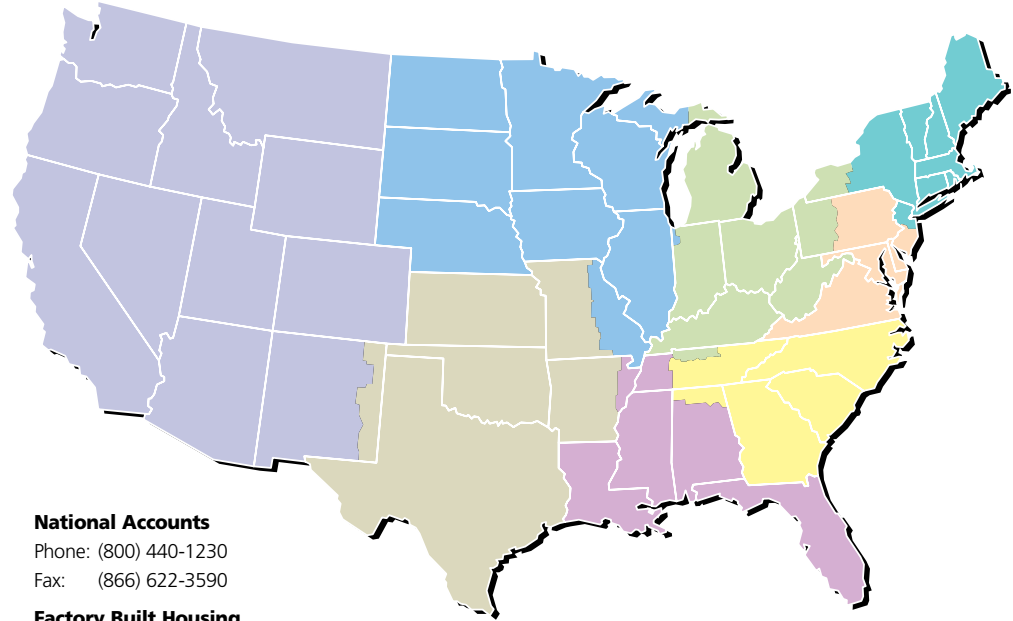
Phone: (800) 548-9396

Fax: (866) 792-7520

Western Area

Phone: (800) 824-4227

Fax: (800) 438-6266



National Accounts

Phone: (800) 440-1230

Fax: (866) 622-3590

Factory Built Housing

Phone: (800) 455-3185

Fax: (800) 639-1714

NATIONAL GYPSUM TRADEMARK INFORMATION

The following are registered trademarks of National Gypsum Properties, LLC.

Gold Bond®	NGC®
DEXcell®	ngc4me.com®
Durasan®	Perfect Spray®
Dust-Tech®	PermaBase®
Edge-Tech®	PermaBase Flex®
EXP®	PermaBase PLUS®
Fire-Shield®	PermaBase UltraBacker®
Fire-Shield C™	ProForm®
GridMarX®	PURPLE®
Gridstone®	Quick Set™
Gypsolite®	Shaftliner XP®
Hi-Abuse®	SoundBreak®
Hi-Impact®	Sta-Smooth®
High Flex®	ThermalFOIL®
High Strength LITE®	Ultra Lite®
Interior Extreme®	Ultra-Shield FS®
Kal-Kore®	Uni-Kal®
Kal-Kote®	X-KALibur®
Kal-Mesh®	XP®
LITE®	1-800-NATIONAL®
Multi-Flex®	

The following are registered trademarks also used in this publication.

- ANSI® is a registered trademark of the American National Standards Institute (ANSI).
- ASTM® is a registered trademark of ASTM International.
- ClarkDietrich® is a registered trademark of ClarkDietrich Building Systems.
- FM Approved® is a registered trademark of FM Global Technologies LLC.
- FM Global® is a registered trademark of Factory Mutual Insurance Company.
- ICC-ES® is a registered trademark of the International Code Council.
- LEED® is a registered trademark of the U.S. Green Building Council.
- MasterFormat® is a registered trademark of the Construction Specifications Institute.
- Microsoft® is a registered trademark of Microsoft Corporation.
- NFPA® is a registered trademark of the National Fire Protection Association, Inc.
- Sporgard™ is a trademark of LANXESS Corporation.
- UL® is a registered trademark of UL LLC.

The color PURPLE® is a registered trademark of National Gypsum Properties, LLC.

©2016 National Gypsum Company

Please note, as of June 1, 2016, the information contained is accurate in all material respects. For the most current version of National Gypsum technical information, visit: nationalgypsum.com

Corporate Headquarters

National Gypsum Company
2001 Rexford Road
Charlotte, NC 28211
Phone: 704.365.7300
Web: nationalgypsum.com

Technical Information

Phone: 800.NATIONAL
800.628.4662
Fax: 800.FAX.NGC1
800.329.6421

National 
Gypsum®