DUPONT BUILDING SCIENCE
BULLETIN

Tyvek® vs. Typar®

Build it once, build it right. When using Tyvek® construction products, you can be assured you are using THE brand leader in secondary weather membranes. Tyvek® Weatherization Systems created Tyvek® HomeWrap® to have the optimum balance of properties for superior performance against the elements AND the competition. So let's define the difference.

A good weather resistive barrier (WRB) must provide four equally important functions. These functions are:

1. It **MUST** have a high level of air resistance - to help prevent drafts, reduce energy bills and resist the flow of moisture laden air though wall cavities.
2. It **MUST** have a high level of water resistance - to help protect the wall cavity from water that gets behind the cladding.
3. It **MUST** have moderate to high vapor permeability - to promote drying in wall systems.
4. It **MUST** be durable to withstand the rigors of the construction site and continue to perform once construction is completed.

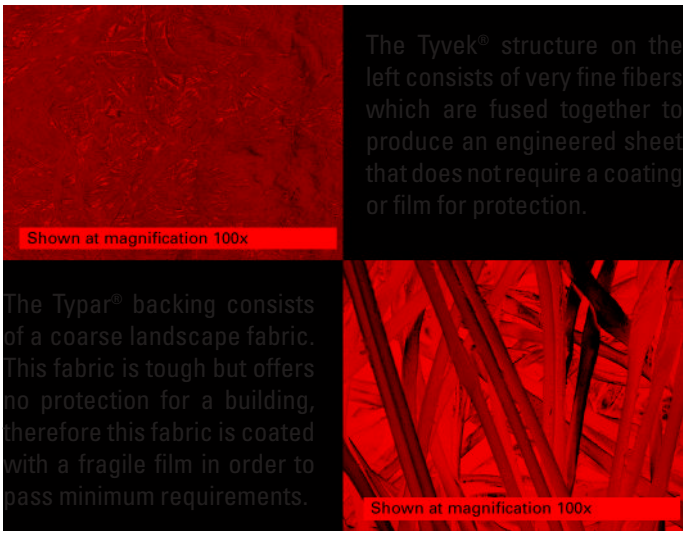
FIGURE 1

Defining the Difference

The Tyvek® Weatherization System consists of products specifically designed for proper moisture management within wall systems. Simply put, Tyvek® outperforms Typar® due to a fundamental difference in construction. Tyvek® is a uniquely engineered product made by spinning extremely fine high–density polyethylene (HDPE) fibers that are fused together to form a strong, uniform web. The tough structure of Tyvek® is engineered to create millions of extremely small pores that resist bulk water and air penetration, while allowing moisture vapor to pass through.

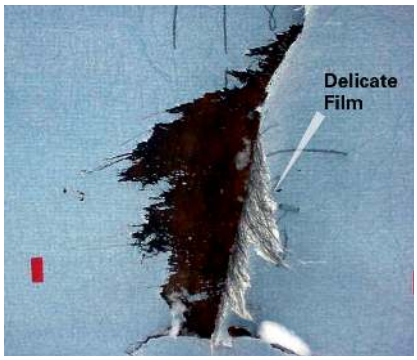
On the other hand, Typar® is manufactured quite differently. The product consists of a two part laminated sheet made up of polypropylene fibers and a film. The polypropylene backing consists of a coarse mesh similar to that of a landscape fabric (See Fig. 2). This mesh is tear resistant but offers no protection for water and air penetration. Consequently, a film layer is added so that minimum water and air resistance standards can be met.

FIGURE 2



A multi-layer product like Typar® is only as good as its weakest component. The film layer is delicate and routinely compromised in the real world through tearing and abrasion (See Fig. 3). Unfortunately, this fragile film is what you would rely upon to protect the homes you build, and ultimately your reputation. The Tyvek® structure is unique and does not require a film or extra layers to perform, therefore there is no compromise.

FIGURE 3



The film layer used with Typar® is weak and routinely damaged in the field. When damaged, the product offers little protection for a wall system.

Performance is Key

Since Typar® relies on a fragile film layer to perform as a WRB, the durability of that film layer must be scrutinized. To demonstrate the reliability of both products, Tyvek® and Typar® were tested for air and water resistance after abrasion exposure. Sample abrasion was conducted per ASTM methods to simulate the rigors of a typical job site. All testing was performed by an independent laboratory on commercially available Tyvek® HomeWrap® and Typar®. The results are clear (See Fig. 4 & 5). After only 5 abrasion cycles, Typar® lost virtually all of its measurable water and air resistance. Because Typar® relies on this mechanically weak film, it is questionable whether it will withstand the rigors of field installation and site exposure. Film damage has been noted with as little as simple routine handling of the product.

Why is Abrasion Resistance Important?

A housewrap must stand-up to the normal rigors of a jobsite. Normal rigors include moving ladders, wrapping corners, installing windows and siding, etc. These normal jobsite activities can damage the fragile exterior microporous film. As indicated by the abrasion testing graphs, damage to the microporous film significantly impacts the ability of the housewrap to hold-out water and air which are the primary functions of the housewrap.

FIGURE 4 WATER RESISTANCE AFTER ABRASION (AATCC 127)

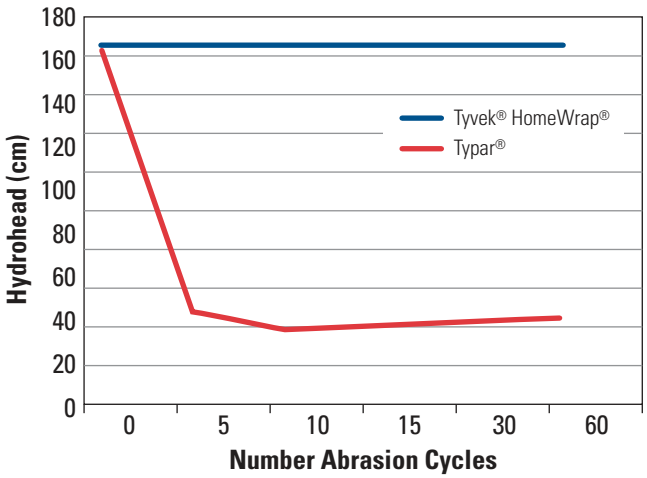


Figure 4 illustrates the effects of abrasion on the water resistance of Typar® and Tyvek®. After as little as 5 cycles, Typar® lost most of its effective water resistance. Tyvek® was not affected after 60 cycles. Test conducted per ASTM D3511.

FIGURE 5 AIR POROSITY AFTER ABRASION (TAPPI T460)

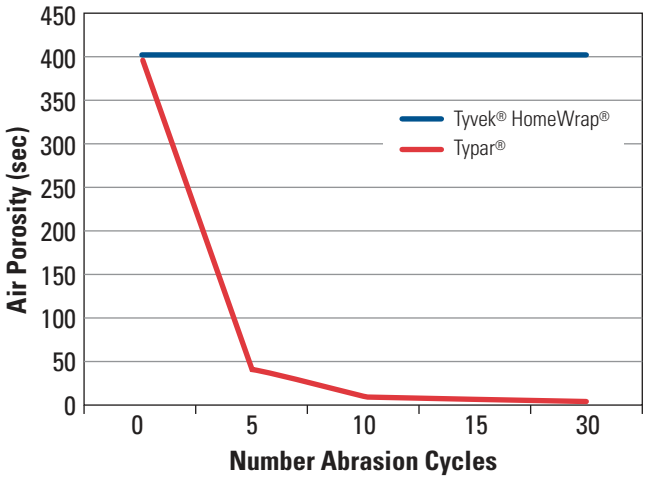


Figure 5 illustrates the effects of abrasion on the air resistance of Typar® and Tyvek®. After as little as 5 cycles, Typar® lost all of its effective air resistance. Tyvek® was not affected after 60 cycles.

Property Stability of Tyvek® HomeWrap® vs. Typar®

Another real-world performance attribute is a materials ability to withstand nature, in particular exposure to the sun and the associated UV exposure. Weather exposure can have a detrimental effect on a weather resistive barrier from the time of installation until covered with a cladding material. Under real time exposure to weather

conditions, Typar® did not hold up to its claims. Tests indicate that within as little as one month, damage to the film layer of Typar® resulted in a loss of most measurable water and air resistance. Under the same conditions, Tyvek® HomeWrap® maintains 100% of these properties. (See Fig 6) Microscopic evaluations of exposed Typar® samples revealed cracking of the film layer which compromises the films ability to resist air and water infiltration. (See Fig 7) Once compromised, the product has little protection for a wall system.

FIGURE 6 WATER RESISTANCE AFTER WEATHER EXPOSURE (AATCC 127)

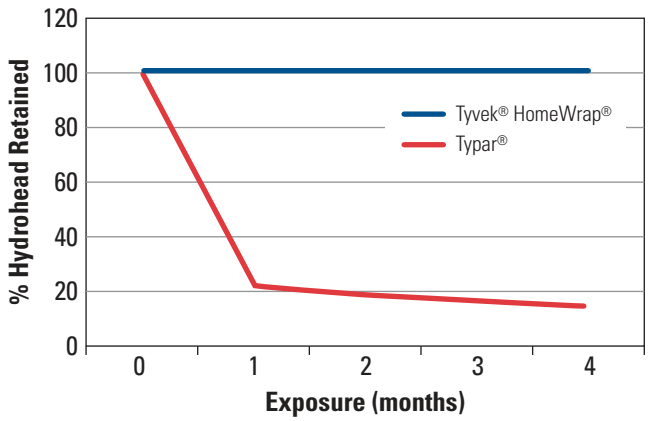


Figure 6 illustrates the effects of outdoor UV exposure on the performance of Typar® and Tyvek®. With as little as one month of exposure, Typar® lost most of its water resistance. After 4 months of exposure, Tyvek® maintained all of its water resistance.

FIGURE 7

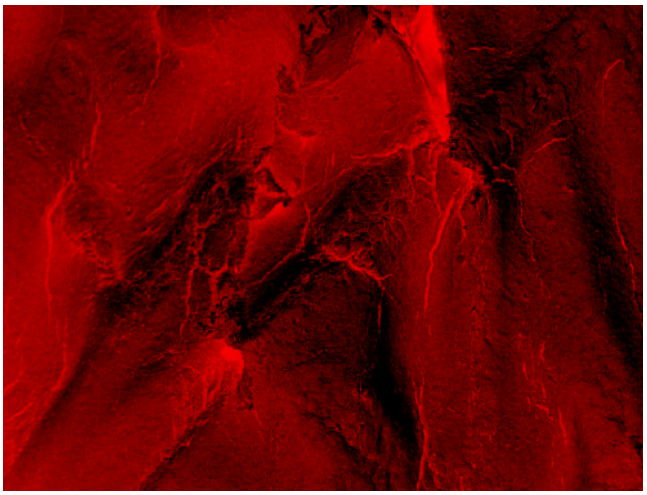


Figure 7 shows the effects of weathering on the Typar® film layer. Cracks and damage occur throughout the film layer, which allow water and air to penetrate.

Vapor Permeability and Drying

One key property of a weather resistive barrier is that it must have sufficient vapor permeability. Building materials get wet during construction and incidental moisture can enter even the most carefully designed and constructed wall system. A moderate to high vapor permeable membrane is necessary to enable this incidental moisture to escape the wall cavity. By allowing moisture vapor to escape, a vapor permeable membrane minimizes the potential for moisture accumulation and promotes dryer wall systems. When walls can't dry adequately, they are more vulnerable to moisture induced damage including mold and rot. Tyvek® is more vapor permeable than Typar®. Figure 8 illustrates a simple test with a piece of wet OSB placed in a sealed pouch of Tyvek® HomeWrap® and Typar®. The drying rates of these specimens were compared to the natural drying of OSB under varying climate conditions. In every case evaluated, Typar® had a negative impact on the drying rate of the specimens. The Tyvek® specimens dried significantly faster than Typar®. If drying is negatively impacted, moisture accumulation and the associated issues are more likely to occur.

FIGURE 8 OSB DRYING CURVES (85°F / 80% RH)

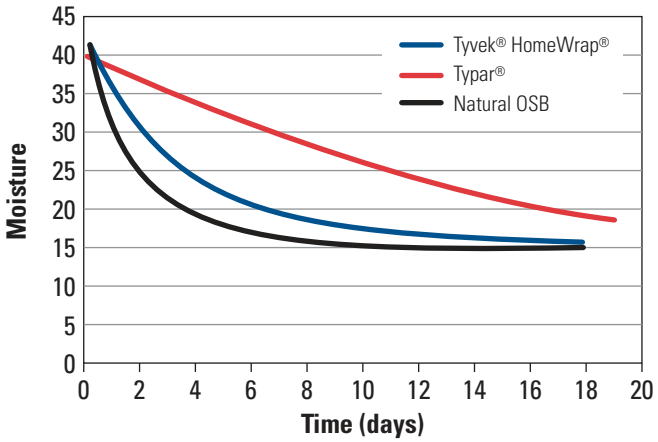


Figure 8 illustrates the ability of wall components to dry when covered with Tyvek® or Typar®. Tyvek® allows the OSB to dry significantly faster than Typar®.

Support and Innovation Make the Difference

TIME TESTED, QUALITY ASSURED. Performance aside, not all housewraps are created equal. Only Tyvek® Weatherization Systems deliver a superior product combined with unparalleled product innovation and field support. Our product's performance has been proven on more homes, over a longer period of time, than any other competitor. With our network of more than 130 Tyvek® Specialists, trained to answer your building science related questions, you are not alone. With Tyvek®, there are no compromises. Simply put, it's easy to see the difference between Tyvek® and Typar®.

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