

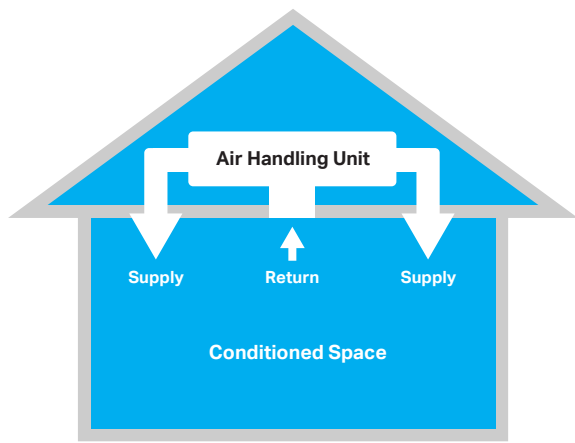


## Unvented Attic Design & Construction

Best practices for high performance using spray polyurethane foam insulation

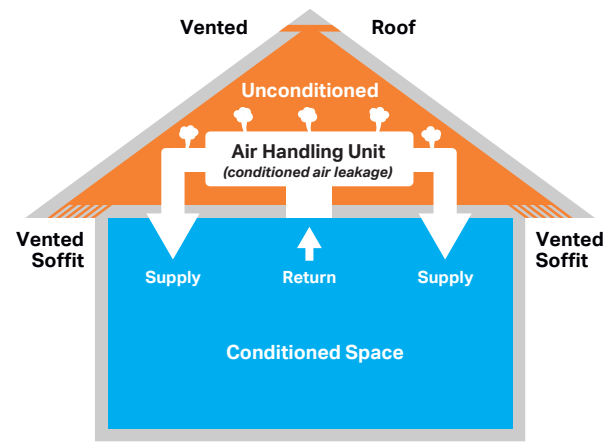
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**Unvented Attic Assembly**

VS



**Vented Attic**

## Performance, design & benefits

Unvented attics (UVAs), sometimes called conditioned or cathedralized attics, are created when insulation is applied directly to the underside of the roof deck, and all ventilation paths such as soffits and ridge/gable vents are either sealed or omitted. This brings the attic into the thermal envelope, which can increase overall energy efficiency.

Most of the energy savings comes from eliminating the potential for air leakage, and moderating the air temperature within the attic to help maintain the temperature set point within the home.

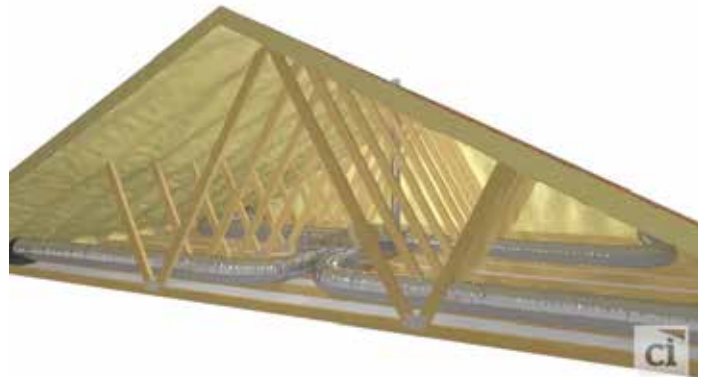
## Using SPF to create an Unvented Attic

Many building experts believe spray polyurethane foam (SPF) insulation provides the most durable and effective means to create an unvented attic. Both low density open-cell and medium density closed-cell SPF can be used to create a UVA, in any climate zone.

SPF is applied directly to the underside of roof sheathing and over the rafters or trusses and gable ends, providing continuous insulation and required air barrier. Thickness should be sufficient to satisfy local energy code requirements for R-Value.

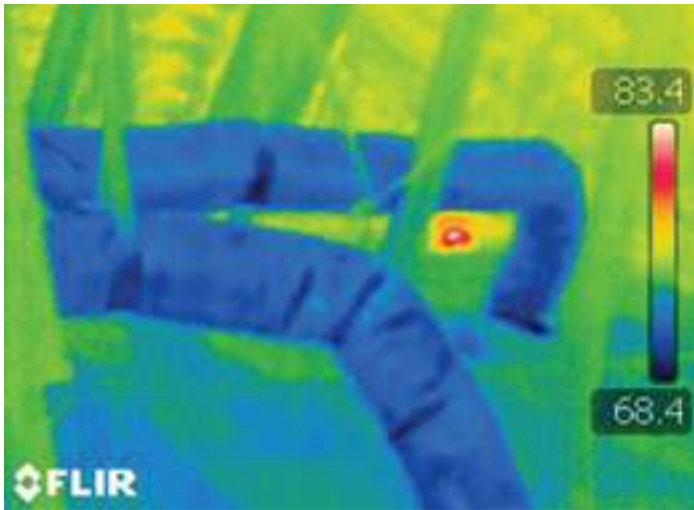
## Design considerations

Unvented attics not only meet more stringent energy efficiency requirements, they also provide noticeable benefits to homeowners. Unvented attics may reduce the cooling load and can also help maintain a consistent indoor air temperature year round.



Builder benefits of unvented attic assemblies:

- Mandatory minimum SPF insulation reduced to R-22 from R-38
- No radiant barrier required
- Ducts contained within conditioned space
- Smaller and less expensive HVAC equipment
- All leakage points sealed effectively with help from SPF
- Less water wasted waiting for it to get cold
- Compliance with California's Wildland-Urban Interface Code requirements
- Soffit baffles and ridge vents eliminated
- Outside noise levels reduced



Ducts stay cool in a static thermal environment; the can light is the hottest thing in the attic

## California Title 24 2016 requirements for High Performance Attics

The new 2016 California Building Energy Efficiency Standards, Title 24 energy standards require High Performance Attics (HPAs) in new single-family residential buildings. Builders can either follow a prescriptive path to construct a HPA, or can use the performance path method to get compliance credit for alternative designs.

An unvented attic with SPF applied to the underside of the roof deck is one common design for HPA performance path compliance. This assembly was first used in the 1970s, and has been implemented much more widely since it was first included in the 2007 IRC supplement to the 2006 IRC code. It has been thoroughly vetted for thermal and moisture performance in all climate zones.<sup>1</sup>

Temperature monitoring as part of one UVA study recorded average attic temperatures of 74-76°F during the cooling season and 70-72°F during the heating season in nine different homes with UVA assemblies. Outdoor air temperatures ranged between 102°F and 32°F during the same monitoring seasons. Such small temperature differentials illustrate the effectiveness of keeping the attic temperature within several degrees of the living space.<sup>2</sup>

**Curious about the cost?** Builders may be pleasantly surprised to learn about the economical advantages of BaySeal® SPF for high-performance attics.

## BaySeal® SPF for CA performance path compliance

Our team of technical professionals has been working in California for over 30 years and knows what it takes to meet performance criteria – from state mandates AND homeowners. Builders who opt for the performance path for CA Title 24 HPA compliance may realize true energy performance value at effective costs using BaySeal® SPF installed by a professional SPF contractor.

“ There are tens of thousands of homes now insulated that way [with SPF] and it can save about 10 to 15 percent on your heating and cooling costs... And for places like Florida, California and Texas, where you have no basements, it adds a conditioned storage space\* to the house and people really like that. You can put stuff up there without worrying about candles melting or things getting ruined by the heat. <sup>3</sup>

### Rick Duncan

Technical Director – Spray Polyurethane Foam Alliance

\*Attics used for storage require thermal barriers. Refer to ICC-ESR 1655 and ICC-ESR 2072 for complete installation and compliance information.

## Ready to get started?

Our technical team can answer all your questions regarding the best BaySeal® SPF product for your specific needs.

Call toll-free 800-221-FOAM (3626) or direct 281-350-9000

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1) Rudd, A. Field Performance of Unvented Cathedralized Attics in the US. Journal of Building Physics 2005: 29; 145.

2) Rudd, A. Field Performance of Unvented Cathedralized Attics in the US. Journal of Building Physics 2005: 29; 145.

3) <http://www.plasticsnews.com/article/20160422/NEWS/160429925/home-improvement-projects-drive-sales-of-spray-foam-insulation>



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