

## Super-Insulation Foam Retrofit Package

This past month Advanced Insulation has received numerous requests from home owners who want to eliminate attic vents and upgrade their attic insulation to half-pound spray foam insulation installed on the underside of the roof deck. These home owners are ahead of the curve. They know that the traditional vented attic with insulation at the bottom chord is slowly becoming obsolete.

Advanced Insulation has been spraying half pound foam on the underside of roof sheathing in new construction for close to six years and getting great results. These unvented attics with cathedralized half pound foam are earning us great feedback. Our customers are telling us that their homes are more comfortable, quieter, and more energy efficient. These houses also have fewer insects in them and less dust because dust isn't being driven through attic vents.

As a result of this interest, Advanced Insulation is beginning to offer a Super-Insulated Foam Retrofit Package for consumers who are requesting an unvented attic with cathedralized half-pound foam insulation. We tell customers if you want the best home performance that money can buy and your home has an air distribution system in the attic, then half pound foam is the way to go.

We also tell these customers that spraying foam in existing homes is more complicated and expensive than in new construction. Our crews have to deal with the existing insulation, sheet rock and homeowners who are living in the house. This article will address how we overcome these obstacles and other common questions about spraying foam in existing homes.

Once you bring the HVAC system into the thermal pressure envelope, you have made a profound change to the home. When you go up into an unvented attic with half pound foam insulation on the underside of the roof sheathing for the first time it is amazing. The attic temperature is within a few degrees of the house temperature and the attic is no longer a dirty and hot environment. You will know immediately, as well as intuitively, that this is a superior insulation system.

The unvented attic with cathedralized half pound foam insulation is also code approved. The 2006 International Residence Code (IRC) permits unvented attics with International Code Council (ICC) approved foam. We've been insulating attics this way since 2004 and getting great results because we tighten up the building and bring the HVAC system inside the thermal / pressure envelope.

When attic vents are eliminated the building gets tighter. Unlike exterior walls that are not vented, vented attics create a clear path for air leakage. Air leaks from the house into the attic through duct work, electrical boxes, chases, holes in top plates, recessed cans, sprinkler system heads... All these leaks are connected to the outdoors via the attic vents.

Advanced Insulation has performed blower door testing on homes with unventilated attics with cathedralized half pound foam and conventional homes. The homes with unventilated attics with cathedralized half pound foam get superior results. The half pound foam passes the ASTM 283 air barrier test. It actually insulates and creates an effective air barrier, which makes it uniquely different from cellulose and fiberglass insulation.

The second benefit occurs when we bring the HVAC system into the thermal pressure envelope. In a conventional attic the air handler and air distribution system are working in an environment that can reach 130°F. The duct work containing the air has a very low R-value and it leaks to a lesser or greater extent. This is obviously bad design. According to the cover story of the January 12<sup>th</sup> issue of Time Magazine, "placing heating and cooling equipment in a sealed and insulated attic can cut energy costs by 25%."

The code requires an R-30 in the Valley and an R-38 in parts of Northern Arizona. The code focuses on the components of an assembly and not the overall performance of the assembly - a flawed approach. Fortunately progressive Municipalities like the City of Scottsdale and others provide performance based paths that will permit six inches of half pound foam. Advanced Insulation has been spraying 6" (R-24) of foam insulation for close to six years in new construction and getting great results in terms of energy efficiency.

Another concern that comes up occasionally with building officials is about foam and fire. Polyurethane foam is a very common product in homes. It is used in carpet pads, sofas and mattresses. The foam we spray is treated with a fire retardant package and is a Class One material. The foam is also separated from the house by a half inch of sheet rock.

To put foam in context with other building products you need to keep in mind that wood, foam and paper on a kraft faced fiberglass batt will all burn. When any of these products catch on fire it is serious cause for concern. Of the three materials, kraft faced paper, not foam, is by far the most flammable.

We also inform customers that if mechanical units are in an unvented attic with cathedralized half pound foam insulation they are required to be either sealed combustion furnaces or heat pumps. We also recommend that a smoke detector be installed in the attic. And finally we suspect that unvented attics may actually be a better strategy to prevent fires because smoke can't escape from an attic, which starves the fire of oxygen.

Another concern about foam is the impact on indoor air quality. It is important to note that half pound foam has been used in homes that meet the standards of the American Lung Association Health House program. In a letter from one of our suppliers, NCFI Polyurethanes, "Sealite™ high performance 'half pound' spray foam insulation contains no VOC's."

We also tell our customers that a controlled fresh air ventilation system is essential. One of the impacts on a house that has an unvented attic with cathedralized half pound foam insulation is that it is tighter. The American Lung Association's Health House program states that a house should be "built tight and ventilated right."

Another request that we frequently get is for "soy" foam. The term "soy" foam is a misnomer. The soy foams advertised in the markets are primarily petroleum based with up to 10% of total volume being soy or other agricultural content. Spray foam is a green product because it saves energy, not because it contains agricultural polyols.

Although spray foam has a lot of obvious advantages, half-pound has one major disadvantage – its cost. Spray foam insulation is expensive. Half pound foam costs four to five times more than cellulose insulation blown in at the bottom chord. There are significant tax credits available in 2009 to help offset costs.

According to the building code, the unvented attic is supposed to be treated as a conditioned space. This can be easily accomplished by removing the existing insulation at the bottom chord. Once the insulation is removed, the sheet rock acts like a radiant and thermal diaphragm that maintains the temperatures in the house and the attic within a couple of degrees of each other.

Advanced Insulation removes the existing attic insulation prior to spraying the foam. This allows our crews have an easier time working in the attic. We also believe that there are advantages from a resale standpoint, if the attic is clean.

When a customer decides to proceed with our Super-Insulated Foam Retrofit Package, we recommend that our customers leave the house when foam is being sprayed. Although our foam supplier's general guidelines do not require this, we believe it is a good idea. In order to reduce odors during the spray process, we exhaust air from the attic. We also leave the fans in place for 24 to 48 hour period during and after the installation.

### **Summary**

For any further questions on half pound foam go to our website:  
[www.advancedinsulationinc.com](http://www.advancedinsulationinc.com)