



INSULAIR[®]

Rafter Vent Mat

US Patent #12,345,437 B2



VENTED ATTIC



www.insulair.net
www.advancedbuildingproducts.com



The Quest for Energy Efficiency

Energy efficiency is a key concern among architects, builders, and homeowners. In the quest to become more energy efficient, homeowners are choosing spray foam insulation for their attic spaces. Spray foam is a great option; however, spray foam often is not detailed and installed correctly, leaving the homeowners doing more harm than good. In order for spray foam to perform at its optimal level, there should be a gap, or airspace, between the underside of the roof deck and the cold side of the spray foam insulation.

Insulair® by Advanced Building Products, is the simple solution to this airspace dilemma. We have invented a product that consists of compression-resistant entangled net technology with a 95% open weave design. This entangled net has a heat bonded filter fabric attached to one side that acts as a superior bonding agent for the spray foam to adhere to while allowing air to pass through the one-inch airspace created by the entangled net design. **Insulair®** comes in a roll and is installed from the roof plate, up against the underside of the roof deck, past the ridge vent and down to the other roof plate allowing air to flow in a convective like fashion reducing the risk of moisture buildup within the underside of the roof deck. Before getting deeper into the **Insulair®** product, let's take a look at the science behind why creating this airspace is so important.

What the experts say...

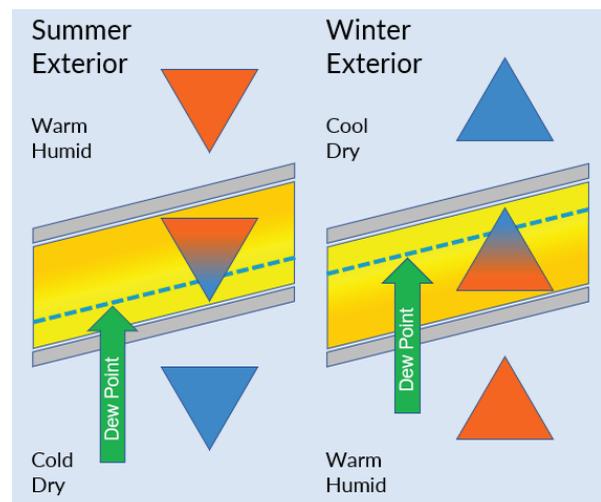
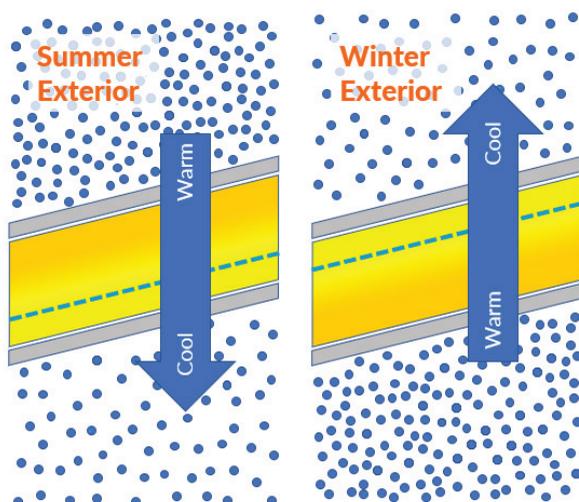
"No one argues that it is a dumb idea to shove a bunch of fiberglass batts into a cathedral ceiling, with no provisions for ventilation air to remove moisture that leaks in from the interior. The results are often catastrophic."

This is a quote taken from the article "Don't Be Dense - Cellulose and Dense-Pack Insulation" written by Joe Lstiburek, who is a well-known Forensic Engineer and Business Science Consultant.

The Science Behind Moisture Migration

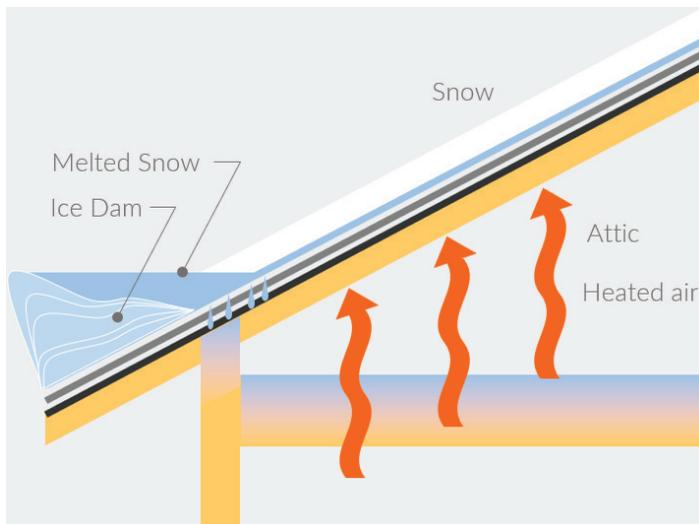
90% of all residential building failures are caused by moisture related issues. Whether we are talking about sidewall moisture, or moisture issues in the roofing structure, moisture will find its way into a building structure. When it does, most homeowners insurance policies only cover \$5,000.00 for moisture related damages. This is why it is so important to detail roofs and walls for moisture intrusion.

When we think of moisture migration, the science is rather simple. Warm air is dense with water molecules. Cool air is sparse with water molecules. The warm dense air will always move towards the cooler air. For example, in the summer the air tries to move from the exterior environment to the interior of the structure. In the winter, just the opposite. The warm air within the house tries to move towards the colder outside air. The intensity in which this movement takes place is called vapor drive.



Condensation & Dew Point

Any air that is above 0% relative humidity has water vapor in it. This water vapor is trying to move. When the warm air meets the cold air, it reaches a temperature that allows the air to be fully saturated with water vapor. This means the relative humidity has reached 100%. When the temperature is below the dew point, the water vapor turns to liquid water and condenses on the surface area of surrounding building materials. In the case of attic spaces, this is usually the underside of the roof deck, or cold side of the spray foam insulation. The fancy scientific term for this is called interstitial condensation. Here at Advanced Building Products we simply call it a restoration problem!



Moisture Buildup in the Insulation

In climates where it is hot and sunny, the roof may heat up enough to carry water vapor away and dry out the insulation; however, what about the sections of roof that do not have access to repetitive sun exposure? What about areas that may have breaches in the vapor barrier at the ceiling? These are all places where moisture will build up and eventually lead to long term damage. This is where water vapor may permeate through the insulation and condense on the underside of the roof sheathing if it is colder. Once the wood becomes wet, mold growth and rotting will take place.

How Do Roof Spaces Fail?

- *Lack of a balanced vent space*
 - o Lack of a balanced vent space means not having equal amounts of Net Free Area in the Ridge Vent and Soffit Vent.
- *Lack of a clear uninterrupted air space from soffit to ridge*
 - o This space is often interrupted by something as simple as misplaced insulation blocking the air channel.
- *Putting a vapor barrier in the wrong place*
 - o Putting the vapor barrier in the wrong place could be as simple as using materials to create channel vents that are non-permeable. Meaning the vapor barrier is in the wrong place.
- *Having a "leaky" vapor barrier on the interior side of a cathedral ceiling*
 - o Meaning the vapor barrier could be filled with numerous holes often created by recessed lighting, electrical boxes, duct work, and tongue and groove wood or other ceiling materials.

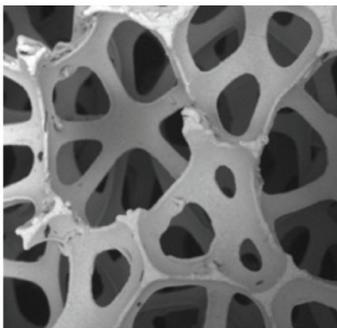
Introducing



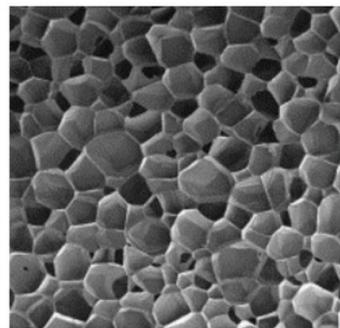
INSULAIR®
Rafter Vent Mat

What is *Insulair*?

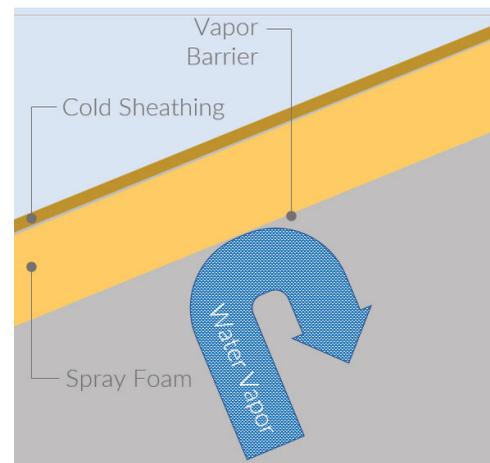
Insulair® is a ventilation mat used to promote airflow in cathedral, vaulted, and attic roofing applications. Manufactured from a 95% open entangled filament design, *Insulair*® is heat bonded to a filter fabric which acts as a buffer between the insulation and the underside of the roofing deck. When a closed cell foam is being used, the airspace created by the *Insulair*® will act as a bond breaker not allowing moisture to condense between the underside of the roof deck and top side of the insulation. Think of *Insulair*® like a car engine. For an engine to perform optimally, there needs to be an intake and an exhaust. *Insulair*® brings that same concept to the roof. The soffit vent acts as the intake. The ridge vent acts as the exhaust, while *Insulair*® is the bridge between the two allowing proper convective airflow from the soffit vent all the way up to the ridge vent. This convective airflow greatly reduces moisture's ability to remain trapped between the underside of the roof deck and the cool side of the batt or spray foam insulation, which allows the insulation to perform at its best without the fear of moisture reducing its R-value.



Open-Cell



Closed-Cell

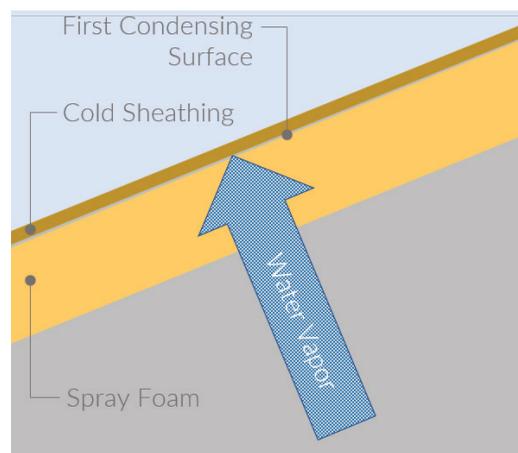


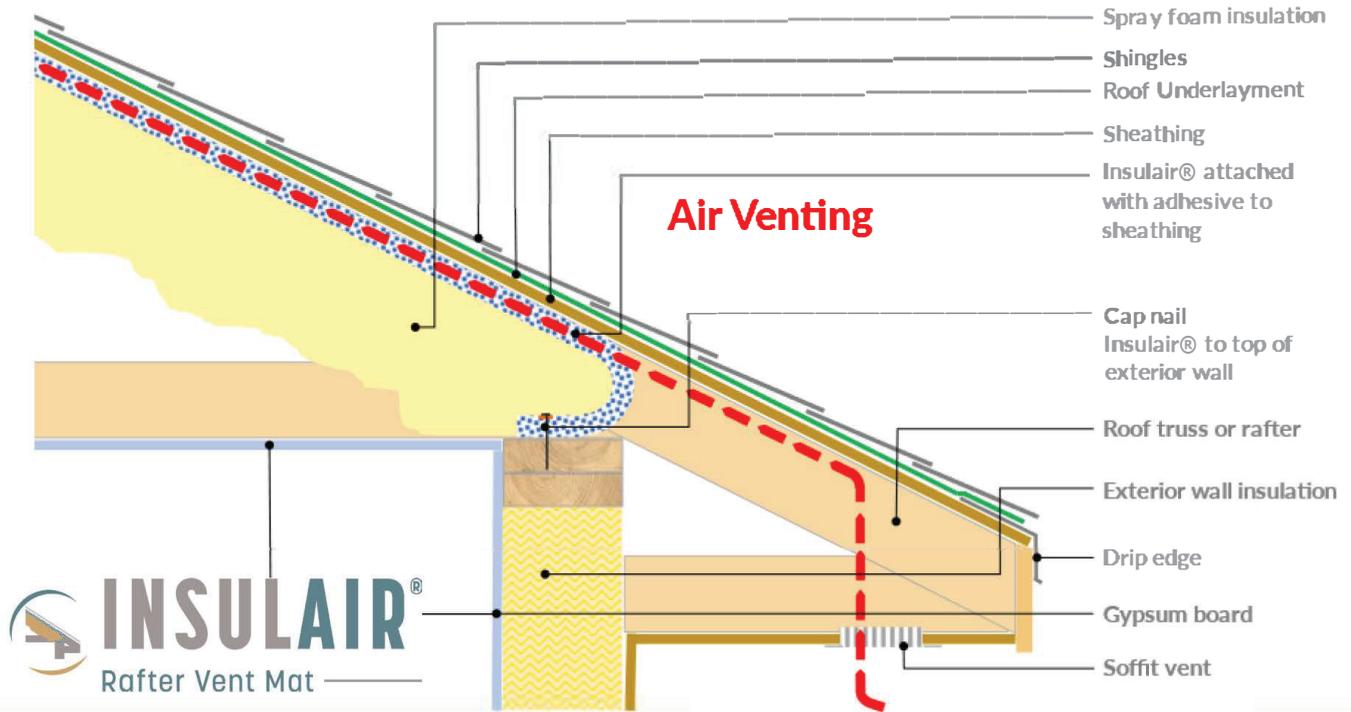
Recommended Applications

- For new construction with spray foam insulation under the roof deck.
- For retrofit of existing attic & roof deck with spray foam insulation.
- For new construction or renovation of cathedral ceiling systems.

Benefits

- Promotes drying in the roof assembly.
- Easy to install from the roll cut to length.
- Able to withstand extreme temperatures.
- Recycled content for LEED Points.



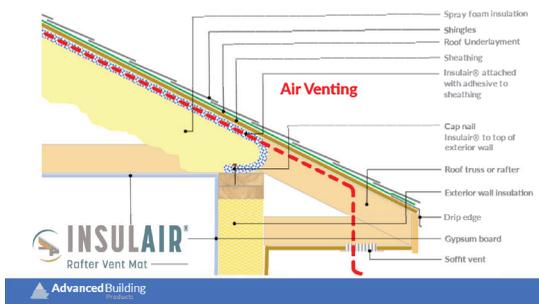


Advanced Building
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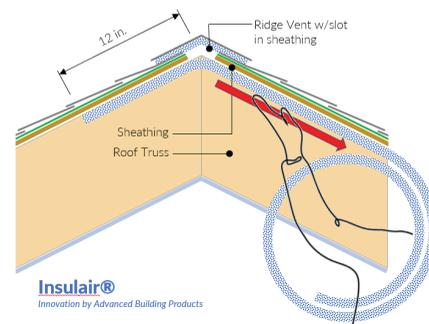
Product	Product Code	Thickness	Width	Length
Insulair®	INSUL116	1.0"	14.5" For 16" Rafters	50'
Insulair®	INSUL124	1.0"	22.5" For 24" Rafters	50'

Installation Instructions

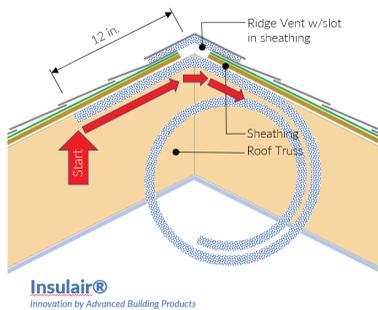
1. Choose the proper width of **Insulair®**. The 14.5" wide roll is intended for 16" rafter spacing. The 22.5" wide roll is intended for 24" rafter spacing.
2. Start by fastening the **Insulair®** at the roof plate near the soffit vent. Fasten the **Insulair®** horizontally between the rafters with the fabric side facing up at this location.
3. Roll the **Insulair®** towards the soffit bending it in a "U" configuration up between the rafters towards the ridge vent. This creates an end dam with **Insulair®** which will avoid any wind washing ability when loose fill insulation is used in the attic space. Be sure the filter fabric is facing out and the entangled net is up against the underside of the roof deck.
4. Place the metal pins provided every few feet in a friction fit fashion between the rafters to keep the **Insulair®** in place during installation.
5. Be sure to run the **Insulair®** from one side of the roof to the other. Do not terminate **Insulair®** at the ridge location for fear of the spray foam flowing out through the ridge vent during installation.
6. Once the spray foam is installed, the **Insulair®** will be permanently locked in place.



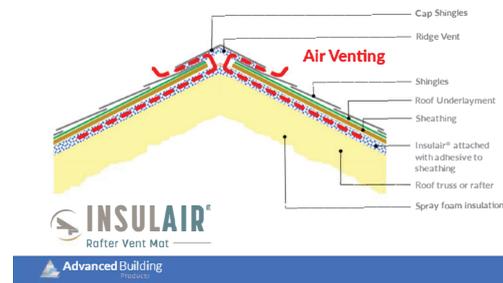
Step #2 - Creating the end dam



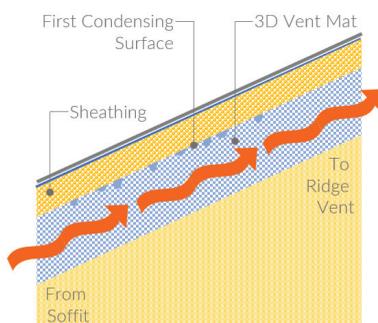
Step #3 - Install toward the ridge



Step #5 - Install from one side



Step #6 - Install spray foam



Proper channel created by **Insulair®** for drainage & ventilation.



Installed from soffit to soffit.

Physical Properties

Product	Insulair 1.0" x 14.5" x 50'	Roll Weight	10 lbs.	
Core Material	Polypropylene (Waffle Pattern)	Core Weight	ASTM D5261	20 oz/sq. yd.
Fabric Material	Polyester	Fabric Weight	ASTM D5261	2.06 oz/sq. yd.
Color	Grey	Total Weight	ASTM D5261	22.1 oz/sq. yd.
Product Width	14.5"	Core Thickness	ASTM D5199	1.00 inches
Roll Length	50'	Total Thickness	ASTM D5261	1.05 inches
Roll Area	58.33 sq. ft.	Core Openness		95%

Product	Insulair 1.0" x 22.5" x 50'	Roll Weight	15lbs.	
Core Material	Polypropylene (Waffle Pattern)	Core Weight	ASTM D5261	20.0 oz/sq. yd.
Fabric Material	Polyester	Fabric Weight	ASTM D5261	2.06 oz/sq. yd.
Color	Grey	Total Weight	ASTM D5261	22.1 oz/sq. yd.
Product Width	22.5"	Core Thickness	ASTM D5199	1.00 inches
Roll Length	50'	Total Thickness	ASTM D5261	1.05 inches
Roll Area	91.66 sq. ft.	Core Openness		95%



Insulair® has a **Net Free Area of 22.48**, which means the use of **Insulair®** will help many ridge vent products perform to their maximum potential.



VENTED ATTIC

