

Building Science is an important piece of what we focus on here at JCL. Creating a thermally efficient and airtight space, it's not enough just to insulate. You must choose the right insulation and air sealing system for the application and be sure it is properly and professionally installed.

- **Constant Owner interaction** means no project manager or multiple people trying to make decisions
- **The highest quality products** and the many small details that often go unnoticed by other contractors, allows us to take your insulation project to the next level
- **Quality Control** is taken seriously at JCL which includes the most up to date training and skills are taught along with documented certifications for installers and management. If any problems or issues take place, they are dealt with immediately
- **Nonstop Communication** is a key to the success of your project. We listen to your needs from the beginning to the end of your project.
- **Solid Science** Our building science experts understand the building envelope. The principles of heat, air and moisture flow and how the building envelope interacts with the building's mechanical systems as well as the people inside.

Without proper air sealing, a building can lose a great deal of its efficiency through air leakage. It is one of the primary causes of hot and cold spots that can cause discomfort for owners. But as with any building product, insulation is only as effective as its installation and where it's applied. Spray foam is only installed by qualified contractors. That is why builders are choosing Spray foam to insulate their homes.

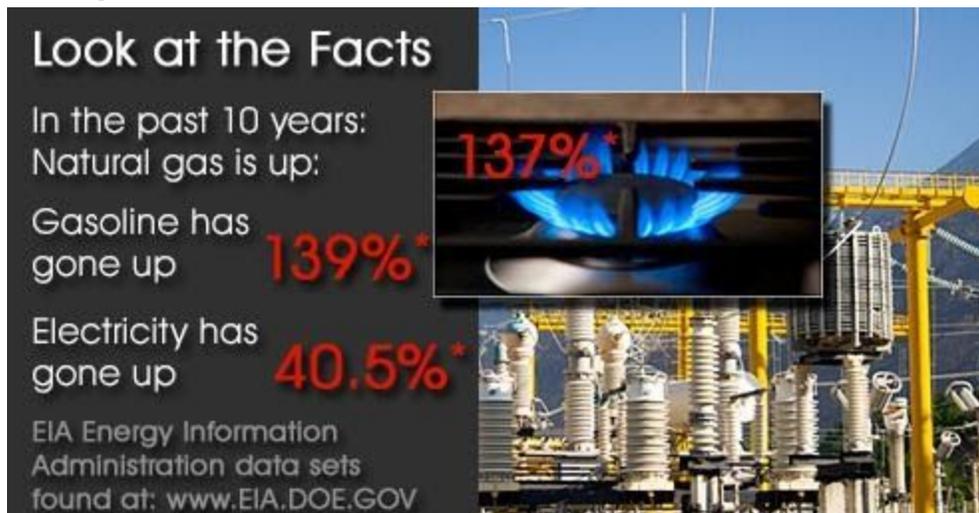
The building envelope performance is enhanced in three extreme ways by Closed cell foam

- **First**, its high R-Value per inch provides outstanding thermal performance, so it minimizes hot and cold spots that can affect the efficiency and comfort of the building
- **Second**, its rigidity provides added structural integrity to your walls and roof
- **Third**, it acts as a secondary moisture vapor barrier to help reduce the risk of moisture intrusion in the wall cavity

Spray foam benefits:

Save on Utilities

With costs rising each year on resources like Natural Gas, Gasoline and Electricity, it's more important than ever to take advantage of the savings of closed cell foam.



JCL's Foam insulation expands around every void and seals all air infiltration, the primary source of energy loss.

Indoor temperatures stay constant, allowing decreased use of heat or air conditioning. This translates to savings on utility bills and extends the life of your heating and cooling equipment by four times.

While the initial costs of installation may exceed that of fiberglass insulation, in the long-term Spray Foam is significantly more cost effective.

Breath Clean Air

In a new construction building, JCL's Spray Foam insulation eliminates air infiltration and seals a building so tight that an air-to-air exchanger must be installed. This results in premium indoor air quality because of dust, fiber, pollen, and other pollutants have no way in.

Our foam applications emit no VOC's or CFC's during the applications or throughout the life of the product.

Inhalation of toxic molds has proven to be a problem for homeowners and insurance companies. JCL's Spray Foam insulation eliminates breeding ground for mold because it eliminates the entry of mold spores and prevents moisture accumulation.

Also, since spray foam expands into the smallest cracks and holes it has proven to reduce the entry of unwanted pest and insects. Spray foam is a polyurethane product and does not act as a nesting ground or source of food for pests.

Create Structural Strength

The application of spray foam actually strengthens a building structure. The expanding foam fills the gap between each wall, floor, or roof cavity. The studs, joists and sheathing are bonded together creating optimum structural strength. After curing, spray foam is durable and will not shrink, settle or disintegrate over time. In fact, research conducted by the National Association of Home Builders (NAHB) has shown walls installed with closed-cell spray foam have a racking strength up to **300% greater** than walls without it.

1.Change the Open Cell Spray Foam verbiage to:

Open cell foam expands to 150% its fluid density which fills wall cavities in one pass. We primarily use open cell foam for Interior walls, between floors for sound deadening. Open cell foam absorbs up to 70% of sound waves and reflects up to 30%.

2.Change the Closed cell Foam verbiage to:

Closed cell foam is an ideal insulation for sealing and protecting a home as it is a 100% air barrier, which is the main source of energy loss.

3.Change Why professional Spray Foam Insulation is essential

Here's why: While there are no VOC'S or CFC's during application, the fluid chemicals during application are still hazardous to your body and health if inhaled. Once the foam is cured, it is 100% inert. In addition, the learning curve to apply foam takes time to perfect. Attempting to perform spray foam insulation yourself can lead to an incorrectly and poorly insulated space, costing you more time and money down the road.

Question

When can foam be installed?

Spray foam insulation is professionally installed at the same point in the construction cycle as other types of insulation. That is, it should be installed after the rough plumbing, electrical wiring, and heating and air conditioning ducts have been installed, but before the interior walls are completed in new home construction. In some cases, spray foam also can be applied in older homes, to the inside of roofs and under floors after construction has been completed.

Which is better, closed or open cell?

Both systems offer significant advantages over fiberglass batting: the ability to air seal; ability to fill cracks and conform to odd shaped cavities; and ability to hold their shape over time and under adverse conditions. But only closed-cell foam has the thermal insulation value (R-value) to bring your home up to Energy Star® standards with only one-half the thickness required for fiber insulations. In addition, closed-cell foam products increase the strength of your wall system (it's approximately doubled) and increase the water-resistance of your home's exterior.

How does closed cell spray foam provide moisture protection, yet still breath?

Unlike cellulose and fiberglass materials, closed-cell foam is impervious to water absorption and wicking. Yet, like Gortex® fabric, the closed-cell structure allows the passage of water vapor (high energy particles) to allow your home envelope to “breathe”.

Spray Foam Insulation in the Attic (Non-Vented Attic Spaces)

In this application, considered the most effective, by most of the SPF industry, the foam is sprayed directly to the underside of the roof between the joists, down around the rim and into the soffit areas, on the gable wall ends, and effectively sealing off and insulating the entire attic space from any air infiltration.

By now you have probably heard of this procedure with terms like: “Hot Roof design”, Unvented Attic, Conditioned Attic, or “The Insulated Envelope.”

Energy Savings

A vented attic situation will become approximately 130-140 degrees in the summer. There's no reason for your air-conditioning and vent-ductwork to have to work in that type of severe conditions. There is also an opportunity for moisture to form due to condensation on these appliances.

By applying spray foam directly to the underside of the roof deck, it now insulates the attic space from the extreme heat that once radiated through the hot shingles sheathing and roof. The severe temperatures no longer exist in the attic. In short, the attic now becomes a passively “conditioned” space of the house that is just as comfortable as any other room in the home.

A roof system insulated with spray foam reduces energy in several ways. Energy loss from ducts located in the attic is essentially eliminated. The top of the building is much tighter resulting in less infiltration and exfiltration, so excess moisture isn't pulled into the attic.

Infiltration through the ceiling is also reduced. In addition, the attic temperature is remarkably lower, which further reduces energy loads.

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Conduction, Convection, and Radiant Heat Transfer

In a standard insulation system, ceiling insulation reduces the transfer of heat from the attic to the living space (in the summer). Attic temperatures can often approach 140 degrees or more during the day. Most of this heat enters the attic space through a multi-step process.

First, solar energy warms the shingles and sheathing. The hot sheathing then transfers heat to the rest of the attic through conduction, convection, and radiant heat transfer. The 140-degree temperature of the underside roof surface drives the heat transfer process that pulls air in from all the openings in a house. And that cost you a lot of money.

By having **JCL** insulate the roof surface with spray foam, the surface temperature exposed to the attic (the temperature driving the heat transfer) is reduced by as much as 40 degrees.

Both conduction and convection heat transfer is proportional to a temperature difference, so that heat transfer will be reduced proportionally to the drop in surface temperature.

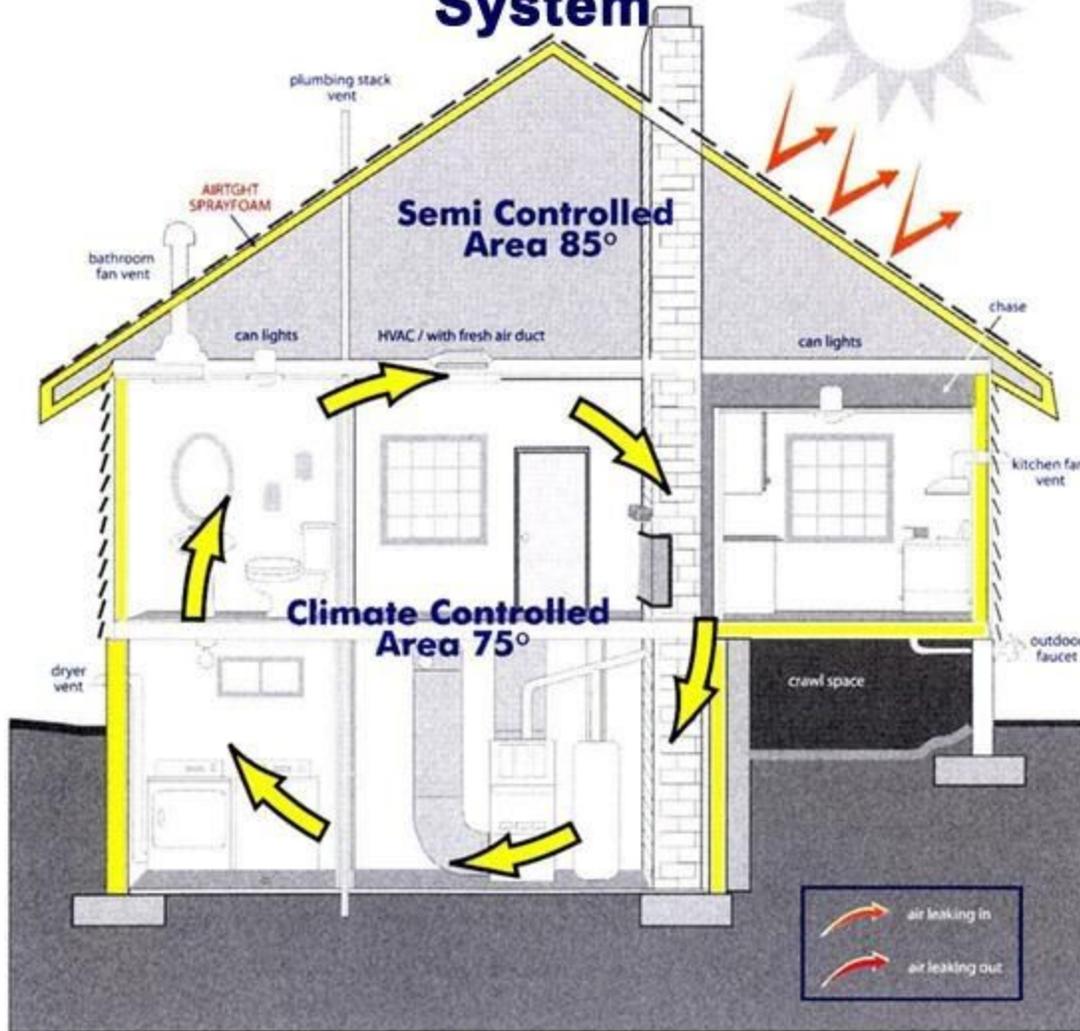
Sealing the attic is the single most cost-effective solution for lower energy bills and a comfortable home.

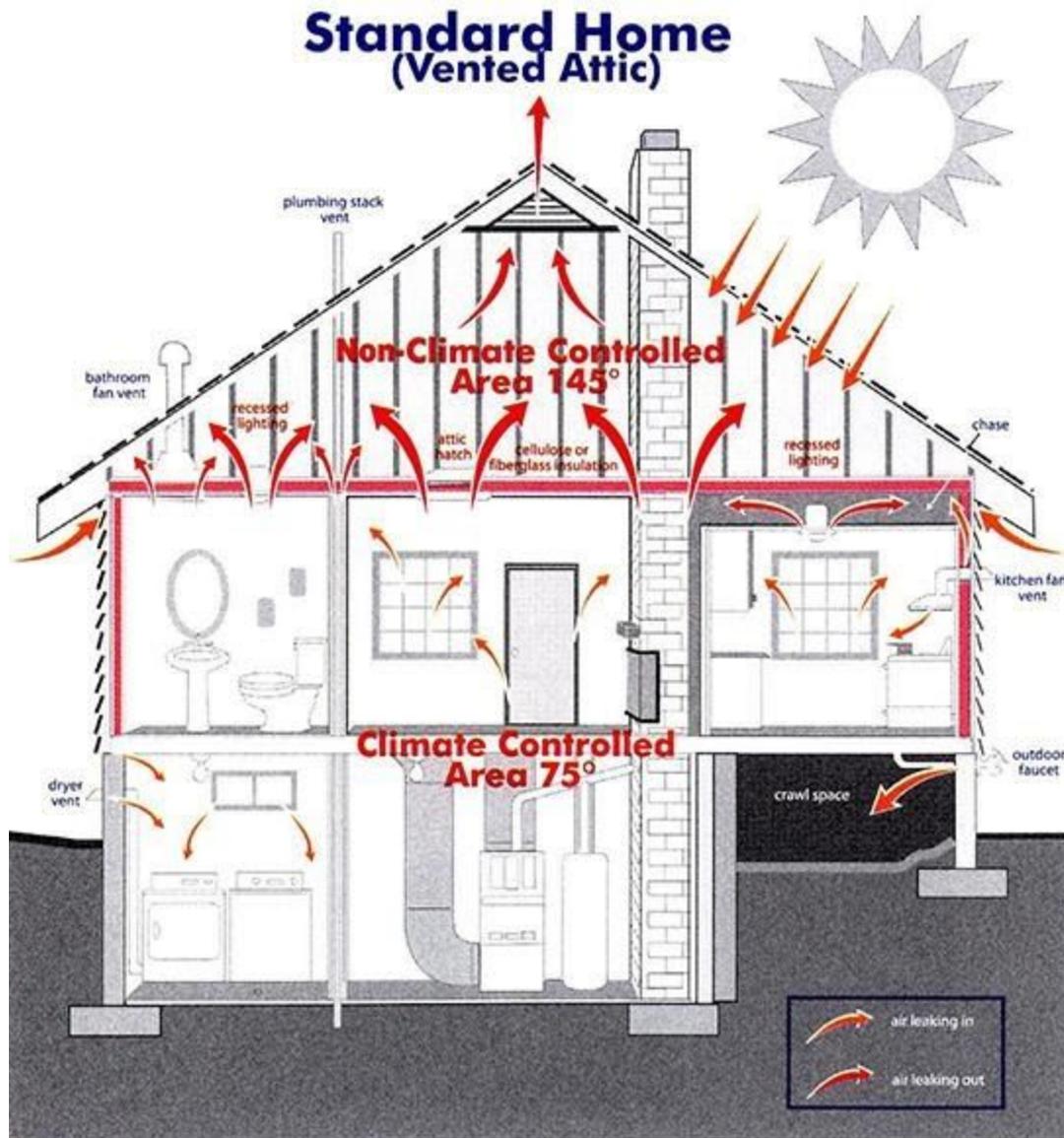
The benefits of including the attic in the insulated space are:

- Duct leakage and heat loss/gain from ducts is much less of an issue
- Air sealing is easier in the roof than in the ceiling

- Tests show energy costs are observably lower when the attic is sealed
- "Stack effect" from wind pressures is eliminated
- Dust and loose insulation are less likely to migrate down to the living space.

Unvented Attic System





Crawl Spaces & Basement Insulation and Remediation

There may not be an area of the home that creates a bigger hazard to the occupants' health than that of a typical crawlspace.

Most homes with crawlspaces, are not properly insulated for moisture control and this can pose health concerns for the occupants, especially children.

Lack of properly sealed and insulated crawlspace can allow deadly and odorless gases to affect occupants. It can also become breeding ground for insects, rodents, and mold. In addition, it could cause damage to the foundation and the floor system.

The Stack Effect

Crawl spaces are often damp, humid spaces due to water runoff from rain, irrigation systems, or an elevated water table. While the building code requires crawl space ventilation, this ventilation does virtually nothing to mitigate moisture problems and can actually make moisture problems worse.

Houses operate like chimneys.

If you introduce a hole at the bottom of a chimney, a natural draft ensues as air exits the top of the chimney.

This is called the stack effect.

Attic ventilation is the top of the chimney and crawl space ventilation is the bottom.

As air is drawn up through your house, moisture, mold spores, odors and soil gases from the crawl space find their way into the living space.

The Solution

Seal the underfloor with Closed cell foam which is an air barrier and vapor retarder. Then we cover the ground with a building code approved 6 mil poly sheeting to further stop soil gases, moisture, water

vapor and odors from being drawn into the crawl space.



Spray Foam Applications

We get asked all the time if we spray commercial wine tanks, or boats, or any number of 'odd' things. **Yes!** Below is a partial listing of applications we have used spray foam for our clients:

- Food industry buildings (all kinds)
- Wine Tanks
- Food Storage Tanks
- Water Tanks
- Fish Holds
- Boat Insulation
- Boat Houses
- Secondary Containment Systems

- Factories
- Chicken Barns
- Hydroponics Systems
- Grow Rooms
- Power Sub Stations
- Pole Barns
- Metal Buildings
- Fishing Boats
- Greenhouses
- Breweries
- Sewer Tanks
- Oil and Gas Industry Tanks
- Silos
- Theaters
- Military Installations / Barracks
- Government Buildings
- Fire Stations
- Police Stations
- Churches

Nobody understands the science of building better than JCL.

If you want to build a thermally efficient and airtight home, it's not enough just to insulate. You must choose the right insulation and air sealing system for the application and be sure it's properly installed.

Did you know that an improperly insulated and sealed home delivers 4500 lbs. of excess greenhouse gases into the air each year? It can also waste 20 percent or more of the energy used to heat and cool the home.

Our Building Science experts understand the principles of heat, air and moisture flow, and how the building envelope interacts with a building's mechanical systems as well as its occupants.

N.A.S.A. applied one-inch of spray-on foam insulation on the Space Shuttle's External Tank that serves to insulate the tank. The closed-cell

foam used on the tank was developed to keep the Shuttle's liquid hydrogen fuel at minus 423 degrees Fahrenheit and the liquid oxygen tank at near minus 297 degrees Fahrenheit even as the tank sits under the hot Florida sun while preventing a buildup of ice on the outside of the tank.

Properly insulating and sealing your homes with Spray Foam is a greener alternative. .

We can help you in specifying the right insulation system for our local climate.

It is now well established and accepted by most architects and builders that controlling air infiltration is the best and most cost-effective means of reducing wasteful heat loss and providing a comfortable indoor environment.

Most architects tend to design structures that are tight and energy efficient by incorporating the latest in proven, energy saving construction details into their drawings.

Unfortunately, too many buildings still perform poorly. Why is this?

We have found that since there is no performance specification to dictate building construction, there is no guarantee when it comes to building performance. Regardless of the contractor's ability, tight buildings are not created from a list of materials and drawings in the absence of specifications that dictate the building's designed environmental performance.

JCL takes a different approach

To improve building performance, our company focuses on the basic building science principle that air infiltration compromises the effectiveness of the building envelope. Our approach is incremental - areas of infiltration are diagnosed and fixed in order of magnitude. This provides the most thorough and cost-effective solution possible.

JCL has satisfied clients. Our clients have been extremely pleased as they benefit from cost-savings and an immediate improvement in comfort.

We operate two-part urethane injection equipment to super insulate new and old buildings. Included in this equipment are special nozzles and guns to seal cracks and small openings which effectively stops infiltration that cause poor thermal performance.

There are other urethane contractors who provide typical spray foam services; however, very few go beyond the installation of conventional spray-roofing and spray-wall insulation processes.

Our capabilities, while serving these common markets in some cases, are specially designed to meet the unconventional needs of specialty markets.

By employing standard and custom equipment which processes foam through both spray and injection techniques, we can utilize numerous chemical systems with varying densities, speeds, closed-cell content, fire rating, vapor permeability, and other desirable environmental characteristics.

While there may be other foam contractors who provide spray and injection services, to the best of our knowledge, we are the only company that currently uses "ratio monitoring" equipment in the field for this process. Ratio monitoring enables our technicians to maintain the exact chemical formulation (mix) for the duration of the installation process.

It is impossible to guarantee that the appropriate mix is being maintained without the use of this equipment.

Washington Pole Barns and Pole Building Insulation

Pole Barns whether used for residential, commercial, industrial or agricultural, are very economic and simple structures to build and they are going up at an incredible rate across the country.

If you are going to condition your space with heat and/or cooling, the most important decision you will make is how best to insulate.

We understand that the main reason why our clients choose to build with these metal buildings instead of traditional materials is to save money... We get it, however it's truly shocking to think some would select batted fiberglass on a metal structure... even though they are trying to **save money!!**

It's much wiser to find something else to pinch or shed from the budget - NOT a **permanent** aspect of the building that determines its comfort and efficiency for the life time of the building!

Spray Foam Insulation is the only logical choice when it's all said and done.

Spray Foam Insulation, especially closed cell SPF is the only insulation material that stops **all** forms of heat transfer, and on a metal building it's even more important due to the very certain issue of condensation.

We have insulated hundreds of new and existing metal buildings, many of which had vinyl wrapped fiberglass installed that we had to then cut out and spray due to various reasons.

Don't be foolish... spend, or better yet ...INVEST in a system that pays YOU back.

For PERMANENT strength, comfort, and efficiency... GO FOAM!



THE SOLUTION



