

## THE ULTIMATE CONSUMER'S GUIDE TO SPRAY FOAM INSULATION: BENEFITS, TYPES, INSTALLATION AND MORE FOR HOMEOWNERS AND PROPERTY MANAGERS.

Whether you're a homeowner or a property manager, if you've ever wondered how you could keep your home comfortable all year and keep your energy costs low, you've come to the right place! We are going to explore the world of insulation through InstallMaster's ultimate guide to Spray Foam Insulation. Step by step, we will walk through insulation types, benefits and exactly how it keeps your home (and wallet) so comfortable.



## HOW DOES HEAT GET INTO MY HOME, AND WHY SHOULD I BE CONCERNED?

Heat gets around in 3 ways:

- ★ Conduction: transfers through materials (think about baking cookies).
- ★ Convection: moving through liquid/gas, so think about a cycle of hot air rising and cool air lowering.
- ★ Radiation: from a single heat emitting source like an electric heater.

### WHY DOES THIS MATTER?

Well, the insulation job is to manage this heat flow, so it's important to understand how heat moves to understand how your insulation works!

## INSULATION'S JOB TO CREATE COMFORT AND SAVINGS

Insulation is a protective shield for your home. It prevents external temperatures from interfering with your indoor comfort. It keeps your heat consistent. In turn, your heater/air conditioner stays more consistent, as well as your wallet, since you nor your HVAC system need to keep putting on layers.

In the past, materials like wood, rocks with wool and horsehair were used. More recently, fiberglass (the cotton candy stuff) and foamboard (the Styrofoam stuff) were popular. These were measured by "R-value". The R-value is a measure of how well the insulation resists the flow of heat. The higher, the better. It's measured by looking at temperature differences between the inside and outside and the rate at which heat is transferred per unit through the material. It's good to note that the R-value isn't only affected by the material but also by the installation method. A nice warm blanket can still leave you cold if it has holes or gaps.

## AIR LEAKAGE THE HIDDEN ENERGY DRAIN

Many insulation types don't help air leakage, which can impact your wallet. Air leakage is typically tested with blower doors, which measure how much air is escaping/entering your space to see how airtight it is. Common sources of air leakage are:

1. the convection process where heat rises and escapes through gaps in the ceiling/attic and
2. gaps/cracks where wind can enter (like doors and windows), creating pressure that forces air out other openings.

As you can see, air leakage is a large factor in managing heat transfer. If you think about that blanket, even if it was made from the warmest wool, the winter chill is going to nip at you through those holes, and your body heat will slowly seep out, too. Not to mention, airflow can bring in moisture; the last thing you want in your cozy nest is the possibility of ice and mould.

## SEIZING THE FUTURE THE NEWEST HEATING SOLUTION

However, you're not alone in this; contractors and scientists alike have been exploring insulation solutions for decades. Starting with horsehair, then fiberglass, modern homes are now moving towards the newest technical leap: Spray Foam Insulation.

Spray Polyurethane Foam (commonly known as SPF) is a material made from a chemical reaction to create an expansive foam. It's used everywhere, not just in insulation, because it's extremely durable without compromising flexibility. It's often used inside sports equipment, and you likely already have some in your house, like in your shoes and even your mattress!

Spray foam insulation has become hugely popular in recent times; it is even endorsed by TV personality and contractor Mike Holmes and the Canadian Mortgage and Housing Corporation for its effectiveness. He has a blog online, too, where he answers questions. Here's one he answered about spray foam:

<https://www.hgtv.ca/ask-mike-holmes-should-i-use-spray-foam-insulation/>

## CHOOSING THE RIGHT TYPE OF SPRAY FOAM OPEN VS. CLOSED CELL

Cells are exactly what you're thinking of; they're little bubbles that make up the foam. In open-foam cells, those bubbles have holes; they aren't full bubbles, so they allow for air and water to enter and exit. Closed foam cells have bubbles that are completely closed, so water and air cannot enter.

They've both spray foam, but they have different properties:

OPEN CELL	CLOSED CELL
Low Density (softer, more flexible)	Higher Density (rigid)
Water/air permeable (not watertight)	Non-permeable (watertight)
Can expand 100x its size.	Can expand 33x its size. Less expansive so it can often be layered (doubles the R-value).
Interior use (cannot withstand elements)	Creates continuous seal/vapour barrier from elements (air, moisture and heat in one application).
Less expensive (more foam coverage)	Strengthens structural integrity of application
	High R-Value
	Good for variety of application: interior and exteriors such as attics, ceilings, crawl spaces, under decks and inside walls.
	Able to get fire rated versions (ASTM E84).

## SPRAY FOAM VS. TRADITIONAL INSULATION

Spray foams can get into small gaps and crevices to fill them thanks to their expansive nature, providing more comprehensive coverage compared to well-placed fiberglass or rigid foam. They can also be used around uneven, hard-to-reach or even oddly shaped surface areas. They can't sag or compress themselves inside a wall as they are rigid in the application area as soon as they cure (harden to their full nature).

Fibrous insulations were great in theory, but they lacked real-world application. Even when installed correctly, gaps/voids can form as they compress or fall over time, retracting from their intended R values. They also can't seal around gaps around windows, plumbing or HVAC systems like spray foam cans.

A series of tests done by a Build America Project using blower door tests demonstrated that a home insulated with SPF had air leakage of 1/3 of other homes that used fiberglass insulation.

Another study came from Canada in 1995, where scientists wanted to test the real-life application of spray foam. They applied it onto exterior basement walls in Ottawa, Ontario. They showed that even in heavy rain and thawing, Spray Foam kept water out, and after 3 years, they found that it was stronger than it had been when they installed it.

To illustrate the differences between insulation types, here are examples of typical R-values (brands vary):

- ★ Mineral Fibre: R-value = 2.8 to 3.7
- ★ Fiberglass (the cotton candy stuff): R-value = 3.7 - 4.3
- ★ Rigid foam extruded polystyrene (the Styrofoam stuff): R-value = 4.5 - 5
- ★ Closed cell foam: R-Value = 5.5-6.0

### EXPERT INSTALLATION: THE KEY TO MAXIMIZING SPRAY FOAM (SPF) BENEFITS

Spray Foam (SPF) is installed using a gaseous blower that blows the liquid into your desired area. The liquid cures (hardens and binds itself) to your wall, ceiling, deck, etc., expanding while it cures to fill in gaps and crevices. **So, what's the process?**

1. Preparing the work site. The best time for spray foam installation is during a new build or a renovation where the walls are stripped to their studs. It should be installed before drywall installation. If drywall is already installed, it will need to be removed. Some companies will inject spray foam into your walls without removing drywall, but this opens you up to long-term complications as there is no way to ensure all gaps are sealed, and it can add unnecessary stress to your studs via uncontrolled expansion. It needs to be installed after your windows, HVAC, plumbing, and electrical systems have all been installed.
2. Check for moisture, rot, and/or damage. The desired application area is checked for moisture and damage. Even on new builds, rain and humidity can seep into wood. This is done using a moisture meter to ensure we aren't trapping anything in with your new insulation.
3. Protect the work site. Windows and other items are protected using plastic tarps to prevent the blown liquid from curing to the intended areas.
4. Spraying the foam. A coating is sprayed in the evening into the desired location using full personal protective equipment. This is important as the liquid spray is caustic, irritating to the lungs and will stick to clothing (and cannot be washed out).
5. Finishing the foam. Once the foam has cured (about 24 hours), the installer will knock down any high areas. Caution: Spray foam is non-toxic once cured (fully dried), but within these 24 hours, it is best to stay outside of the home to prevent breathing potentially harmful gasses.
6. Confirm customer satisfaction. Once everything is cured and even, the customer has the option of adding a second layer of spray foam or another material if space permits. Adding a second layer will double the R-value of the insulation. That's a benefit to using the denser ~1" thick closed-cell foam.

Remember, Spray foam exceeds energy standards, but only if applied correctly. Your installer needs to know the ins and outs of their machine and product to make sure every nook and cranny is covered. Without proper precaution and technique, water and air can get trapped in unsealed areas. Remember, closed-cell foams are watertight, so water won't be going anywhere once it's inside.

## THE SPRAY FOAM BENEFIT

Spray Foam can provide you with unparalleled efficiency, consistent temperatures, lower carbon footprint, added structural integrity, increased home value, and sometimes, it can even lower your insurance costs (check with your insurance provider first!). It can help by lowering your energy costs, increasing the longevity of your HVAC system, preventing dust/air pollutants from entering and even resisting pests due to its less candy-looking nature.

Both Canada and the Province of New Brunswick periodically offer incentives for making your home greener. If you're interested, check out the current programs in your areas:

### GREENER HOMES GRANT CANADA @

<https://natural-resources.canada.ca/energy-efficiency/homes/canada-greener-homes-initiative/canada-greener-homes-grant/canada-greener-homes-grant/23441>

### NB POWER (SAVEENERGYNB)

[https://www.saveenergy.nb.ca/en?gclid=CjwKCAjw59ip8h81EiwAccEiLSvbr1W7muwA\\_Xsln0e2tamSGWfKgdnGKH2KwyR6redqMogQdLl1RoC61UQAvD\\_BwE](https://www.saveenergy.nb.ca/en?gclid=CjwKCAjw59ip8h81EiwAccEiLSvbr1W7muwA_Xsln0e2tamSGWfKgdnGKH2KwyR6redqMogQdLl1RoC61UQAvD_BwE)

### ARE YOU READY TO ENTER THE NEW AGE OF INSULATION?

Contract InstallMasters and start saving on energy while making your property more comfortable. Don't wait to take the first step. Reach out, and we can help assess your needs.



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