INSULATION MATERIALS

COMPARISONS

3M
Polystyrene Foam Insulation
Aislamiento de Espuma
de Poliestireno
78
Spray Adhesive
Spray Adhesivo
SPRAYS DOWN
ROCÍO INVERTIDO

FOAM

What’s the Difference between
U-factor and R-value ?
The biggest difference between U-factor and R-value is that U-factor measures the rate of heat transfer (or loss) while R-value measures the resistance to heat loss. R-value is a measure of conductivity.

In terms of energy expenditure, most homeowners would save up to 20 percent of their heating and cooling costs if they insulated their homes properly, the U.S. Environmental Protection Agency reports.

How Much Heat Is Lost Through Uninsulated Walls?

Insulating only your home's walls will not be sufficient. The majority of heat is lost around windows and doors, as well as through uninsulated ceilings.

What Contributes to Heat Loss?

There are a number of ways a home loses heat energy.

The primary ways a home loses heat is through:

Air leakage around doors and windows (35 percent)

Doors and windows (20 percent)

Slab or basement (15 to 18 percent)

Floors (15 to 18 percent)

Walls (12 to 15 percent)

Ceilings (10 percent)

Read more: http://www.doityourself.com/stry/the-proper-way-to-calculate-home-heat-loss#.U0L_uVcXLlw#ixzz2yEPUOT4a

Rolls and Batts

Rolls and batts -- or blankets -- are flexible products made from mineral fibers, such as fiberglass and rock wool. They are available in widths suited to standard spacing of wall studs and attic or floor joists: 2 inch x 4 inch walls can hold R-13 or R-15 batts; 2 inch x 6 inch walls can use R-19 or R-21 products.

Loose-Fill Insulation

Loose-fill insulation is usually made of fiberglass, rock wool, or cellulose in the form of loose fibers or fiber pellets. It should be blown into spaces using special pneumatic equipment. The blown-in material conforms readily to odd-sized building cavities and attics with wires, ducts, and pipes, making it well suited for places where it is difficult to effectively install other types of insulation.

Rigid Foam Insulation

Rigid foam insulation is typically more expensive than rolls and batts or loose-fill insulation, but it is very effective in exterior wall sheathing, interior sheathing for basement walls, and special applications such as attic hatches. Foam insulation R-values range from R-4 to R-6.5 per inch of thickness, which is up to 2 times greater than most other insulating materials of the same thickness.

Foam-in-Place Insulation

Foam-in-place insulation can be blown into walls, on attic surfaces, or under floors to insulate and reduce air leakage. You can use the small pressurized cans of foam-in-place insulation to reduce air leakage in holes and cracks such as window and door frames, and electrical and plumbing penetrations.

There are two types of foam-in-place insulation: closed-cell and open-cell. Both are typically made with polyurethane. With closed-cell foam, the high-density cells are closed and filled with a gas that helps the foam expand to fill the spaces around it. Closed-cell foam is the most effective, with an insulation value of around R-6.2 per inch of thickness.

Open-cell foam cells are not as dense and are filled with air, which gives the insulation a spongy texture. Open-cell foam insulation value is around R-3.7 per inch of thickness.

The type of insulation you should choose depends on how you will use it and on your budget. While closed-cell foam has a greater R-value and provides stronger resistance against moisture and air leakage, the material is also much denser and is more expensive to install. Open-cell foam is lighter and less expensive but should not be used below ground level where it could absorb water. Consult a professional insulation installer to decide what type of insulation is best for you.

Install attic air barriers such as wind baffles along the entire attic eave to help ensure proper airflow from the soffit to the attic. Ventilation helps with moisture control and reducing summer cooling bills, but don't ventilate your attic if you have insulation on the underside of the roof. Ask a qualified contractor for recommendations.

Be careful how close you place insulation next to a recessed light fixture—unless it is insulation contact (IC) rated—to avoid a fire hazard. See the Lighting section for more information about recessed lights.

Follow the manufacturer's installation instructions, and wear the proper protective gear when installing insulation.

Material	Application Tips	Pros	Cons
Cellulose	Available as loose fill. Appropriate for small to large remodels in parts of the structure with very low to no moisture. Good for wall cavities or attic floors and ceilings. Wall cavities need small holes to spray through. Can be blown in dry, or sprayed in damp to prevent gaps and settling.	* Requires up to 30 times less energy to make than fiberglass and mineral wool * At least 75% post-consumer recycled content (newspaper) * No effect on indoor air quality (treated with nontoxic borate)	* Can absorb moisture * Can settle (if blown in dry)

Cotton	Available as batt and loose fill. Appropriate for small to large remodels in areas with very low to no moisture. Good for wall cavities or attic floors and ceilings. Batts require open walls.	* Renewable, plant-based material * At least 70% post-industrial recycled content (e.g., denim) * Recyclable * No effect on indoor air quality (treated with nontoxic boron)	* Cotton farming typically uses large volumes of water and pesticides * Can absorb moisture

Fiberglass	Available as board, batt, and loose fill. Appropriate for small to large remodels in areas with very low to no moisture. Good for wall cavities or attic floors and ceilings. Batts and boards require open walls. Boards can be used in interior basement spaces.	* Made of abundant material (silica) * Up to 40% recycled content	* Releases eye, throat and skin irritants * Energy-intensive manufacturing process * Some products contain formaldehyde

Polyisocyanurate Foam Insulation	Foam insulation boards. Appropriate for larger projects or new construction in areas with low to no moisture. Choose closed-cell option for higher moisture areas. Best for interior basement walls, beneath siding, and attic ceilings.	* No hydrochlorofluorocarbons (HCFCs) * Typically no indoor air quality effects	* Made from petrochemicals * Not recyclable

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What is the Difference Between Open-cell and Closed-cell Polyurethane Foams?

Open-cell foam is soft - like a cushion or the packaging material molded inside a plastic bag to fit a fragile object being shipped. The cell walls, or surfaces of the bubbles, are broken and air fills all of the spaces in the material. This makes the foam soft or weak, as if it were made of broken balloons or soft toy rubber balls. The insulation value of this foam is related to the insulation value of the calm air inside the matrix of broken cells. The densities of open-cell foams are around 1/2 to 3/4 of a pound per cubic foot.

Closed-cell foam has varying degrees of hardness, depending its density. A normal, closed-cell insulation or flotation polyurethane is between 2 and 3 pounds per cubic foot. It is strong enough to walk on without major distortion. Most of the cells or bubbles in the foam are not broken; they resemble inflated balloons or soccer balls, piled together in a compact configuration. This makes it strong or rigid because the bubbles are strong enough to take a lot of pressure, like the inflated tires that hold up an automobile. The cells are full of a special gas, selected to make the insulation value of the foam as high as possible.

The advantages of the closed-cell foam compared to open-cell foam include its strength, higher R-value, and greater resistance to the leakage of air or water vapor. The disadvantage of the closed-cell foam is that it is more dense, requiring more material, and therefore, more expense. Even though it has a better R-value, the cost per R is still higher than open-cell foam. The choice of foam should be based on the requirements for the other characteristics - strength, vapor control, available space, etc.

Both types of foam are commonly used in most building applications. Some are inappropriate in specific applications. For example, you typically would not use open-cell foam below grade where it could absorb water; this would negate its thermal performance because water is a poor insulator compared to air. Closed-cell foam would be a good choice where small framing sizes need the greatest R-value per inch possible. Basically, the choice depends on the conditions of each installation. We routinely select from a wide variety of foam systems with varying characteristics, depending on the particular requirements of our clients' projects.