



Spray Foam Insulation

Types of Spray Foam Insulation

The two types of spray foam insulation are open-cell and closed-cell. Each kind has its advantages and disadvantages, based on insulation needs and costs.



Open-cell foam means that the cells are broken and air fills the gaps inside the material. Open-cell foam is thus softer and less structurally stiff than closed-cell foams, where the cells form a cohesive structure. The closed-cells hold their shape as they are filled with gas, making them stronger to pressure and also creating a better insulator. If the foam will not be stressed by outside forces, doesn't need to conform to a solid shape, and the budget is limited, then open-cell foam is best. For areas that need higher insulation of air and water vapor, will have more

Open-cell foam means that the cells are broken and air fills the gaps inside the material. Open Cell is thus softer and less structurally stiff...



exposed usage, require structural support or decoration, and the budget is higher, then closed-cell foam is a better option.

Whereas open-cell foam is limited in its insulation range, closed-cell foam can vary greatly in density and insulation factors. The density relates directly to insulation value and is measured by weighing one cubic foot (cu. ft.) of the foam material. Open-cell foam weighs between 0.4 and 0.5 lbs/cu. ft, with an R-value (insulation) factor of about 3.5 per inch. Closed-cell foam can be made with densities as high as 1.7 to 2.0 lbs./cu. ft. The higher density not only allows for it to be molded for decorative or light structural uses, it also provides R-values of about 6.0 per inch. For comparison, roofing applications have densities in the 2.8 to 3.0+ lb./cu. ft. range, so regular closed-cell foam is not really a load-bearing material, but it can reinforce and decorate as well as insulate. Some closed-cell polyurethane foams can reach a density of 30 lbs./cu. ft. to 40 lbs./cu. ft., and are painted to simulate wood or marble.

Differences in cost are based not only on materials, but also on methods used for application. Open-cell foam can be easily applied and installed using a low-cost, water-based process. Open-cell foam also occupies more space per weight (i.e., it is less dense), so less material is needed to fill an area. Closed-cell foams are heavier, require the proper R-value blowing agents for application and are thus more expensive and more difficult to install. The insulation gain of closed-cell vs. open-cell foam is not always cost-effective, so that factor must be taken into consideration when choosing spray foam insulators.