

Polyurethane Insulation: A Sustainable Material

Buildings are responsible for over 40 percent of global energy consumption and more than one-third of greenhouse gas emissions. Today's green building sector offers many market-ready solutions to reduce the energy requirements of buildings. One particular area has significant potential to enhance building energy efficiency—thermal insulation. Energy lost through walls, roofs and windows is the largest single waste of energy in most buildings. Energy loss in buildings means increased operating costs, loss of comfort, and reduced productivity. Here, we will take a comprehensive look at why polyurethane insulating foams are an excellent material to conserve energy and resources in buildings.

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Outstanding Performance

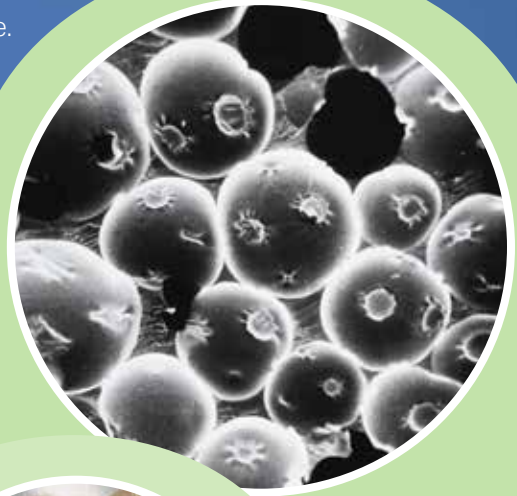
Insulation performance is typically measured by R-value, or thermal resistance. The higher the R-value, the better the material insulates against heat transfer. Closed-cell polyurethane (PUR) and polyisocyanurate (PIR) foams have some of the highest R-values of all commercially available insulation products. In addition, polyurethane foam insulation also eliminates thermal bridging and provides critical air sealing. The U.S. Environmental Protection Agency estimates that homeowners who air seal and insulate their homes can save up to 20 percent of heating and cooling costs. Furthermore, polyurethane insulation has the ability to minimize moisture accumulation within a building. All these performance attributes create a more comfortable and cost-effective living environment.

Versatility

The high insulating properties of polyurethane insulation allow for more flexibility in building design. With polyurethane insulation, architects and designers can reduce wall thickness to allow for more interior and living space. Polyurethane spray foam is extremely versatile – it can be sprayed onto virtually any surface, providing airtight insulation for complex interior spaces. When properly installed, polyurethane foam insulation forms an air seal that prevents leaks and eliminates thermal bridging. Polyurethane foams also have the ability to improve building durability and performance by protecting structural framing.

Environmental Considerations

Foam can provide environmental benefits in a variety of ways – from providing superior insulating properties, to reducing the weight of finished products, to giving designers materials with which they can exceed minimum thermal insulation requirements in cost-effective ways. Better insulation typically results in less energy use. The energy conservation achieved by insulating and sealing a building effectively helps to reduce greenhouse gas emissions associated with the burning of fossil fuels to generate electricity. In fact, according to McKinsey and Company, foam plastic insulation products save up to 233 times the carbon dioxide emissions over their useful life, compared to the amount of emissions generated to manufacture and install them. For all these reasons, polyurethane foams can contribute to the creation of a more sustainable society by helping to conserve resources today.



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