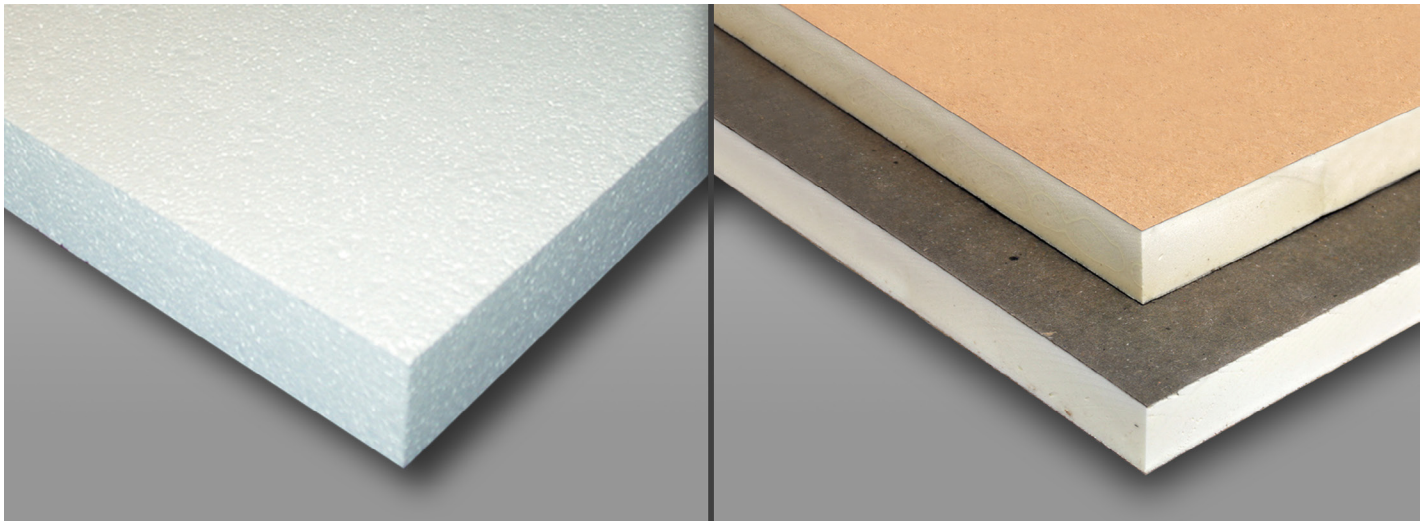
ROOFING COMPARISON OF POLYISO AND EPS INSULATION

First, let's define the two types of insulation we are comparing. Expanded Polystyrene (EPS) is a lightweight, rigid, thermoplastic closed-cell foam insulation. Polyisocyanurate (Polyiso) is a rigid, thermoset closed-cell foam board insulation consisting of a foam core between two facers.



LONG-TERM THERMAL RESISTANCE (LTTR)

Long-Term Thermal Resistance (LTTR) is a scientifically supported method to calculate the 15-year, time-weighted average R-value of closed-cell insulation products. Polyiso insulation has a high R-value per inch (5.7) compared to other insulation products on the market. EPS insulation's R-value varies depending on the density of the foam and can range from 4 to 5. This performance characteristic allows polyiso insulation to deliver greater energy savings potential in thinner product thicknesses, which can be advantageous in height-restricted areas.

FLEXIBILITY IN ROOFING ASSEMBLIES

Polyiso insulation is compatible with most types of cladding and roofing materials, such as metal, brick, stone, wood, vinyl, asphalt shingles, etc. It can be attached with adhesives, mechanical fasteners, or hot mopping. Polyiso is also lightweight and easy to cut and install. In comparison, EPS is not compatible with some types of cladding and roofing materials, such as adhesives, hot mopping, or torch-down roofing, without the use of slip sheets or additional cover boards. It can be damaged by high temperatures or solvents and requires a protective layer or coating to prevent UV degradation. EPS can also be molded into different shapes and sizes to fit various design needs.

FIRE RESISTANCE

Polyiso insulation is a thermoset material that does not melt or drip when exposed to flame (ASTM E84). In comparison, EPS is less fire-resistant; it melts and drips when exposed to high heat, which can spread the fire and create toxic fumes. Polyiso also offers a direct-to-deck attachment option for steel deck roofs (FM 4450/UL 1256).

ENVIRONMENTAL AND OTHER ATTRIBUTES

Polyiso insulation contains blowing agents with zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP), reducing buildings' energy use and associated greenhouse gas emissions. It is also recyclable through reuse where permitted and contains recycled content, which varies by product. While EPS can also contain recycled content, polyiso insulation's high thermal efficiency results in energy savings potential equal to 47 times the product's embodied energy.

In conclusion, the choice of insulation material for a commercial roof system is a critical decision that directly impacts the building's performance, energy efficiency, and overall value. Polyiso insulation is the superior choice due to its exceptional thermal efficiency, fire resistance, ease of installation, environmental sustainability, and long-term cost savings. Please see the links below from the Polyisocyanurate Insulation Manufacturers Association (PIMA) for unbiased manufacturer resources.

https://www.polyiso.org/

https://www.polyiso.org/page/PolyisoBenefits

https://www.polyiso.org/page/R-VALUEMETRICS?&hhsearchterms=%22lttr%22

https://www.polyiso.org/page/TB204?&hhsearchterms=%22eps%22