



Rigid Foam Insulation - The Differences Are Clear

If performance and cost-savings matter to your project, understanding the difference between the leading types of rigid foam insulation can save you up-front material costs while providing better energy performance, over the life of the building. Geofoam EPS is designed to provide architects, designers and contractors every benefit that rigid foam insulation has to offer, in terms of strength, energy efficiency, and moisture resistance.

EXPANDED POLYSTYRENE [EPS]

Raw Material : Polystyrene Resin

Manufacturing Process:

Expanded plastic resin is molded to form a closed-cell material that utilizes trapped air as an insulating medium.

Compressive Strength:

15, 25, 40, 60 psi

R-Value & Energy Efficiency:

Geofoam EPS is R-4.8 per inch at 40o F and R-4.3 per inch at 75o F.

R-Value Warranty:

50 years

Moisture Performance in 15-Year Real World Test

EPS & XPS side-by-side on the same building, excavated after 15 years. as a below grade foundation insulation.
EPS maintained 94% of its published R-Value.
EPS contained only 4.8% moisture content.
EPS was LESS affected by moisture given the R-Value at time of extraction, compared to XPS.

Permeability:

Higher rate of permeability equals quicker expulsion of moisture and consistent R-Value performance.

Recycled Content:

up to 15% recycled content.

Environment/Sustainability:

HFCs, CFCs, HCFC's formaldehyde or color dyes are not present in EPS. The white color of polystyrene is naturally occurring.

Constructability:

Widths: 8", 12", 16", 24", 36", or 48"
Lengths: 2', 4', 8', 9', 10', and 16'
Thickness: any thickness from one-half inch to 36"
R-Value: depends on the thickness selected

Testing | Codification | Certification

ASTM C578 (see other side)

Cost

At equal R-Values, EPS generally costs up to 30% less.

EXTRUDED POLYSTYRENE [XPS]

Raw Material : Polystyrene Resin

Manufacturing Process:

Liquidified plastic resin is extruded through a die to form a closed cell material that uses trapped air as an insulating material.

Compressive Strength:

15, 25, 40, 60, 100 psi

R-Value & Energy Efficiency:

XPS is R-5.4 per inch at 40oF and R-5.0 per inch at 75oF.

R-Value Warranty:

50 years

Moisture Performance in 15-Year Real World Test

EPS & XPS side-by-side on the same building, excavated after 15 years. as a below grade foundation insulation.
XPS maintained only 52% of its published R-Value.
XPS contained 18.9% moisture content.
XPS was GREATLY AFFECTED by moisture given the R-Value at time of extraction.

Permeability:

Lower rate of permeability delays the drying process, resulting in longer R-Value recovery time when exposed to moisture.

Recycled Content:

Has limited amounts of recycled content, and not offered in all products.

Environment/Sustainability:

XPS generally contains HFC's (such as HFC 134a). HFC's are environmentally harmful. XPS also contains color dyes.

Constructability:

Widths: 16", 24", or 48"
Lengths: 8'
Thickness: 3/4", 1", 1-1/2", 2", or 3"
Limited sheet thickness for R-Values

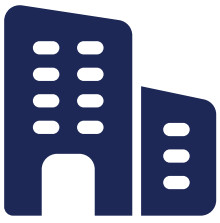
Testing | Codification | Certification

ASTM C578 (see other side)

Cost

At equal R-Values, XPS generally costs up to 30% more.





Roofing:

EPS maintains its original R-Value; 30 year old “in service” EPS, when tested, has the same R-value as when installed. It is also warranted for 100% R-Value for 20 years! EPS is easier to fabricate for taper systems and is thicker, allowing it to be applied in one layer, reducing labor and time.

XPS costs more, and loses R-Value over time.

Perimeter, Underslab, and Geofoam:

EPS in perimeter and underslab installations performs as well (or better!) at less cost. EPS comes in thick, large blocks (3’x4’x8’ is typical), and is more competitively priced, making Geofoam the smart choice.

XPS requires application of multiple layers & absorbs more moisture in ground contact.

ASTM C578

Specification for Rigid, Cellular Polystyrene Thermal Insulation

			Density (pcf)						
Classification			Type XI	Type I	Type VIII	Type II	Type IX	Type XIV	Type XV
Nominal Density			0.75	1.00	1.25	1.50	2.00	2.50	3.00
Density, min. lb/ft ³			0.75	0.90	1.15	1.35	1.80	2.40	2.85
Property	Units	ASTM Test							
Thermal Resistance R Values (at 75° F)	per inch thickness	--	3.1	3.6	3.8	4.0	4.2	4.2	4.3
Strength Properties Compressive (10% def)	psi	D1621	5	10	13	15	25	40	60
Flexural	psi	C203	10	25	30	35	50	60	75
Moisture Resistance Absorbtion (vol.)	%	C272	4.0	4.0	3.0	3.0	2.0	2.0	2.0
Capillarity	--	--	none	none	none	none	none	none	none
Coefficient of Thermal Expansion	In./.(in.) (F)	D696	0.000035	0.000035	0.000035	0.000035	0.000035	0.000035	0.000035
Maximum Service Temperature Long Term Intermittent	°F	--	167 180	167 180	167 180	167 180	167 180	167 180	167 180
Oxygen Index	%	D2863	24	24	24	24	24	24	24
Dimensional Stability	% Change	C303	Max 2.0	Max 2.0	Max 2.0	Max 2.0	Max 2.0	Max 2.0	Max 2.0

Poly Molding LLC | 96 Fourth Avenue | Haskell, NJ 07420

Toll free: 800.229.7161 | Office: 973.835.7161

www.polymoldingllc.com