

Long-Term Performance Matters

Why EPS is the smart choice for stable, long-term performance over XPS

	EPS (Expanded Polystyrene)	XPS (Extruded Polystyrene)
Long-Term Thermal Resistance	Stable Lifetime R-Value	Thermal Drift Decreases R-Value
R-Value per Inch	R-3.9 to R-4.6 per Inch	R-4.6 to R-5.0 per Inch
Warranted R-Value	100% (20 Years)	90%
Thicknesses	Up to 40"	Up to 4"
Compressive Strength	10-60 psi	15-100 psi
Cost Efficiency*	Highest R-Value Per Dollar	Moderate R-Value Per Dollar

EPS Has Stable, Consistent, R-value (No Thermal Drift)

EPS has a stable R-Value (even when exposed to moisture) because it is not made using HFC, whereas XPS's R-Value irreversibly decreases over time from dissipating gasses.

EPS Has the Highest R-Value Per Dollar and is the Most Cost-Efficient Option

EPS provides the highest R-value per dollar, over XPS. R-value targets can also be achieved with fewer layers versus XPS because EPS can be manufactured up to 40" thick vs. 4" for XPS).

EPS 100% Performance Warrantied from Insulfoam

Insulfoam provides a full, 100% R-value 20-year performance warranty, whereas XPS is typically warranted at 90% of the published R-value (due to off-gassing which leads to thermal drift).

EPS from Insulfoam is Available in Customizable Product Dimensions & Strength

Unlike XPS, EPS is not limited to 25, 40, and 60 PSI. We can deliver insulation in a broader range of compressive strengths, thickness, sizes, and tapers, enabling you to use fewer layers while saving money.

EPS Has Low Global Warming Potential (GWP)

EPS's ASTM C578 certified manufacturing process uses pentane, which has a very low global warming potential (GWP).

EPS Water Absorption and Drying Potential Facts

Some EPS/XPS comparisons can be misleading because they only use short-term laboratory tests conducted for 24 hours or less.

The microscopic interstitial spaces (tiny gaps between fused beads) in EPS, enables it to release moisture more quickly. In several long-term exterior exposure studies, EPS has demonstrated lower water absorption, an ability to dry better and not retain water over the long term. In fact, when exposed to the extreme conditions of the ASTM C1512 Test by the EPS Industry Alliance, EPS exhibited drying potential that XPS did not. Additionally, after 15 freeze-thaw and 60 wet-dry cycles, EPS recovered close to its original thermal resistance (within 3%), whereas XPS lost up to 20% of its R-value and retained up to 18% moisture by volume.

*Fine Homebuilding. *Buyers Guide to Insulation: Rigid Foam*. By Martin Holladay.

*Angi. *EPS vs. XPS Insulation: What's the Difference and Which One Is Right for You?* by Amy Freeman. "EPS costs up to 30% less per board foot than XPS for the same R-value..."

	EPS (Expanded Polystyrene)	XPS (Extruded Polystyrene)
Performance Warranty	100% R-Value 20-Year Thermal Performance Warranty. Part of the Carlisle Total Roofing System warranty.	90% R-value or less; warranty varies by manufacturer. (Effective warranty is R-4.23 to R-4.5)
Dimensions Available	Typical 4' width and up 48" thick. Custom sizes/slopes available.	Typical 4' width; limited to 4" thick. Standard sizes.
ASTM C578: Rigid Cellular Polystyrene	Compliant	Compliant
ASTM D1621: Compressive Resistance	Compliant	Compliant
ASTM C518: R-value	Compliant	Compliant
ASTM C1303: Long-Term Thermal Resistance (LTTR) Reporting Requirement	R-value remains stable over time. No thermal drift.	R-value degrades over time, due to gas diffusion.
ASTM C203: Flexural Strength	Compliant	Compliant
ASTM C272: Water Absorption	Compliant ¹ 2.0–4.0% by volume. Slightly higher initial absorption; releases moisture more quickly.	Compliant 0.3% by volume or less. Lower initial absorption; retains moisture longer.
ASTM C1512: Drying Potential When Exposed to Environmental Cycling	Good ²	Poor ³
ASTM E96: Water Vapor Permeance	Compliant ⁴	Compliant ⁵
ASTM C1338: Fungal Resistance	Compliant	Compliant
ASTM E84: Flame Spread & Smoke Developed Index	Compliant Flame Spread ≤ 25; Smoke ≤ 450	Compliant Flame Spread ≤ 25; Smoke ≤ 450
NFPA 285: Fire Tested	Compliant when combined with approved fire-resistant facings and non-combustible claddings.	Compliant when combined with approved fire-resistant facings and non-combustible claddings.
GWP (Global Warming Potential)	< 5 kg CO2 (Pentane blowing agent)	Legacy: ~1,430 (HFC); New: < 1 (HFO blends)
UL Certifications	Compliant	Compliant
International Building Code (IBC)	Compliant	Compliant
International Residential Code (IRC)	Compliant	Compliant
International Energy Conservation Code (IECC)	Compliant	Compliant

The information presented is based on publicly available data and materials believed to be reliable as of the date of publication. Product specifications, features, and performance characteristics of competing products are subject to change without notice. Insulfoam®, Carlisle EPS Holding, LLC makes no representation or warranty regarding the completeness or accuracy of comparative information and encourages customers to verify current product details directly with the respective manufacturers.

¹ Varies by product: Type XI, I, VIII, II, IX, XIV, XV). 0.3% by Volume for R-Tech products.

² Under EPS Industry Alliance C1512 test, EPS dries significantly during the cycling stage, demonstrating long-term drying potential, critical for maintaining R-value under severe long-term exposure. Source: Drying Potential of Polystyrene Insulations Under Extreme Environmental Cycling Conditions, EPS Industry Alliance 2014

³ Under EPS Industry Alliance C1512 test, XPS did not exhibit drying potential when exposed to same severe long term exposure conditions as EPS.

⁴ EPS vapor permeability (without facers) ranges from 2.5 to 5.0 perms for a 1-inch-thick material depending on density.

⁵ XPS vapor permeability (unfaced) for 1-inch-thick (25-mm) material has a perm rating around 1; measured as semipermeable.

Trusted among building contractors, civil engineers, specifiers and architects, Insulfoam delivers engineered EPS solutions with long-term thermal performance, backed by expert design and technical services, vertical integration, and a robust national footprint.