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Frequently Asked Questions
15 Year In-Situ Results

Q. What does this newly published information tell us?

A. In an actual below-grade application, EPS did better than XPS at maintaining its R-value and at maintaining a lower moisture content. In addition, this study has demonstrated that short-term total-immersion testing is not a good indicator of how insulations will perform in actual construction applications. A summary of the results and typical ASTM values follow:

	15 Yr. In-situ Test Results				ASTM C578 Values	
	Results Upon Extraction		Results after 30 days @ 72° F & 50% R.H.			
	EPS	**XPS**	**EPS**	**XPS**	**EPS**	**XPS**
R-Value/inch	3.4	2.6	3.7	2.8	3.6	5.0
Moisture Content (Volume %)	4.8	18.9	0.7	15.7	4.0	0.1

Q. Why are the results for moisture absorption so different from what the XPS manufacturers publish in their literature?

A. Moisture absorption for foam plastic insulations has been measured using ASTM C272-01, *Standard Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions.* This test method measures the moisture absorption of a product after it's been completely immersed in water for a period of 24 hours. The ASTM C272 test is a good indicator that XPS takes on less moisture than EPS during a 24 hour period. However, it's not a good indicator of how the product will perform over its intended service life since full immersion conditions are not typically encountered in field applications.

Q. How is it that a lighter density EPS absorbs less moisture than a higher density XPS?

A. If the complete immersion test referenced above was extended for a time much longer than the prescribed 24 hours, both products would ultimately absorb more moisture and reach a saturation point. Because of the density and manufacturing differences, the EPS absorbs more moisture in the short-term. It's these differences that also allow the EPS to "give-up" moisture when drier ambient conditions exist. The XPS takes-on moisture more slowly but then holds onto it as well. As both products are cycled through wet and then dry environments, the EPS takes-on and then gives-up moisture while the XPS takes-on and holds the moisture. The cumulative effect of the XPS' inability to effectively give-up the moisture it has absorbed results in it having a higher moisture content during an extended service-life.

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Q. Why are the R-Value results so different from what the XPS manufacturers publish in their literature?

A. The R-Value was greatly reduced because the XPS absorbed such a high quantity of moisture during its service life. Water has a high thermal conductivity making it a poor insulator.

Q. Why is this comparison just now being done?

A. EPS samples from this original installation were also tested approximately 1 year and 3 years after installation with similar results – the EPS had an average moisture content of 5% by volume after one year and 3% after three years. The XPS had an average moisture content of 13.5% after just 15 months. We would expect the moisture content of the EPS to go up or down throughout its service life (4.8% moisture for most recent samples) and the XPS results to continue to increase (18.9% moisture content for most recent samples). For whatever reason, the results obtained originally were not well publicized. Similar studies have been performed and reported by The National Research Council of Canada (NRC), The Society of the Plastics Industry, Cold Regions Research and Engineering Laboratory (CRREL) of the US Corps of Engineers, Minnesota Department of Public Services and the EPS Molders Association (EPSMA). A comparison of the results from the 15-year test to ASTM C272 follows:

Moisture Content Comparison		
Test type	**EPS**	**XPS**
24-hour Immersion Test (ASTM C 272)	4%	0.10%
Approx. 1-year In-service (below grade)	5%	13.50%
Approx. 3-year In-service (below grade)	3%	Not Tested
Approx. 15-year In-service (below grade)	4.80%	18.90%

Q. What other advantages does EPS have over XPS?

A. In addition to the long-term performance advantages, EPS comes in a wider variety of thicknesses, compressive strengths and panel sizes. This is especially true when higher compressive strengths are required since the XPS is offered in very limited thicknesses and panel sizes. In addition, for higher density product, the EPS is likely to be more readily available.

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Q. Now that I know this information, where can I use EPS?

A. EPS has already been used successfully in virtually every construction application. This information simply reinforces what EPS manufacturers have known. EPS has a proven track record in the following applications: below-grade, below-slab, cavity wall, EIFS, Geofoam and cold storage facilities.

Q. Why would I use the R-Tech® product instead of standard InsulFoam® EPS or standard XPS for below grade and other construction applications?

A. Unlike EPS or XPS, the R-Tech product comes with a polymeric film on both sides which provides the following benefits.

- Additional jobsite durability - less breakage and less waste
- Allows the product to be provided with the InsulSnap™ feature which means the 4' x 8' panels can be scored at pre-requested intervals to meet job-specific applications – less material handling, less labor to install, less waste
- When installed in a dead air space, the R-Tech can be supplied with a metallic-reflective facer which will provide enhanced R-Values – less material handling, less labor to install
- The facers are virtually impervious to moisture enabling the product to have an even lower moisture absorption rate
- With thinner sizes, it's possible to wrap corners without breaking the product – easy to install, less waste

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