



## EPS No.1018

**Subject:** Long Term Performance of EPS - 30 Year Old Field Samples

**Date:** February 2009

The R-value of insulation over a service life of 20 years and longer is a critical factor to consider when specifying an insulation product today. Insulation should be selected and designed based upon its warranted R-value at an age of at least 20 years old to ensure that energy savings calculations can be relied upon for the life of the structure.

Foam-Control EPS is manufactured by a process in which the R-value for the insulation is stable for the life of the product. Foam-Control EPS is warranted to maintain 100% of its claimed R-value for 20 years.

Some foam plastic insulation board manufacturers provide an estimate of thermal resistance due to the fact that their products outgas blowing agents and as a result lose R-value over time. The test procedure used by these manufacturers for estimating R-value is often called LTTR or long term thermal resistance. LTTR provides an estimate of **average** R-value and not the future R-value. Therefore, **it is essential to specify the actual R-value of an insulation after 20 years of service life.** Also, you must specify that the insulation manufacturer provide a copy of their warranty to ensure they warrant 100% of the R-value of their insulation for 20 years.

In the fall of 2008, a church school in Fond du Lac, Wisconsin was re-roofed to replace an aging 30 year old roof membrane. EPS was used for insulation at the time of the original installation. Random samples of the 30 year old EPS were selected and sent to a third party independent test laboratory to determine the R-value of the EPS that was removed from the building.

EPS Properties				
	Density lb/ft <sup>3</sup>	R-Value @ 75 °F °F.ft <sup>2</sup> .h/Btu	Compressive Strength @ 10% strain, psi	Flexural Strength, psi
<b>30 Year Old Type I Samples</b>	0.91	4.0	11.2	32.5
<b>ASTM C578 Type I min. Requirement</b>	0.90	3.6	10.0	25.0

Independent testing has confirmed that EPS, even after working on a roof for 30 years, still maintains its original claimed R-value. The R-value of the 30 year old EPS exceeds the minimum R-value requirement of ASTM C578. Other foam board insulations which lose blowing agents over time would not be able to meet their LTTR claimed R-value after 30 years.

In addition to R-value, the 30 year old EPS samples were tested to determine their compressive and flexural strength. Again, the 30 year old EPS samples exceeded the minimum physical properties stated in the ASTM C578 standard.



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