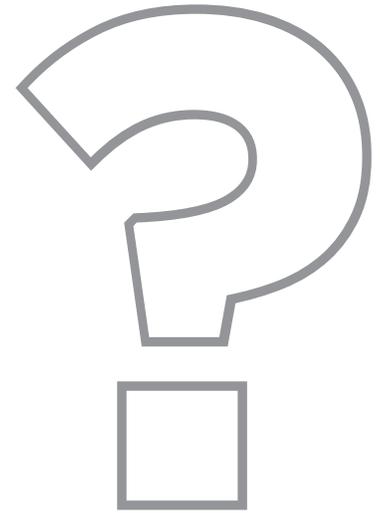




LONG-TERM THERMAL RESISTANCE

# WHAT'S THE R-VALUE OF YOUR INSULATION IN 50 YEARS



## Foam-Control MAX<sup>®</sup> has a Permanent Lifetime R-value.

Foam-Control MAX is a unique closed-cell foam. The gas in the cells of Foam-Control MAX is simply air from the atmosphere. Because Foam-Control MAX is inert and does not change over time, it holds a permanent lifetime R-value.



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## Thermal Resistance of Insulation.

Insulation is of paramount importance to reduce the energy consumption of buildings. In the summer, insulation reduces the heat flow from the hot exterior to the cool interior environment. In winter, insulation reduces the heat lost from the warm interior to the cold exterior. The resistance to heat flow through an insulation is called “thermal resistance”. Thermal resistance is commonly referred to as R-value. A complete understanding of the R-value of insulation over its lifetime is critical to designing buildings that achieve reduced energy consumption.

Most people understand that the higher the R-value, the greater the insulating power of an insulation. However, many people do not understand that the R-value of Polyiso and XPS is lost over the lifetime of the product.

## Polyiso and XPS Lose R-value Over Their Lifetime.

It is well understood that Polyiso and XPS insulations trap gas in their cells other than air and Polyiso and XPS will lose the gas over time. This is a natural process of materials coming to equilibrium with the environment. If this encapsulated gas assists with providing R-value then the R-value of the insulation will drop over time.

The trapped gases in the cells of Polyiso and XPS foam assist to provide an initial high R-value. During the life of these foams, air from the atmosphere diffuses in and the trapped gases diffuse out. The result is Polyiso and XPS lose R-value over their lifetime.

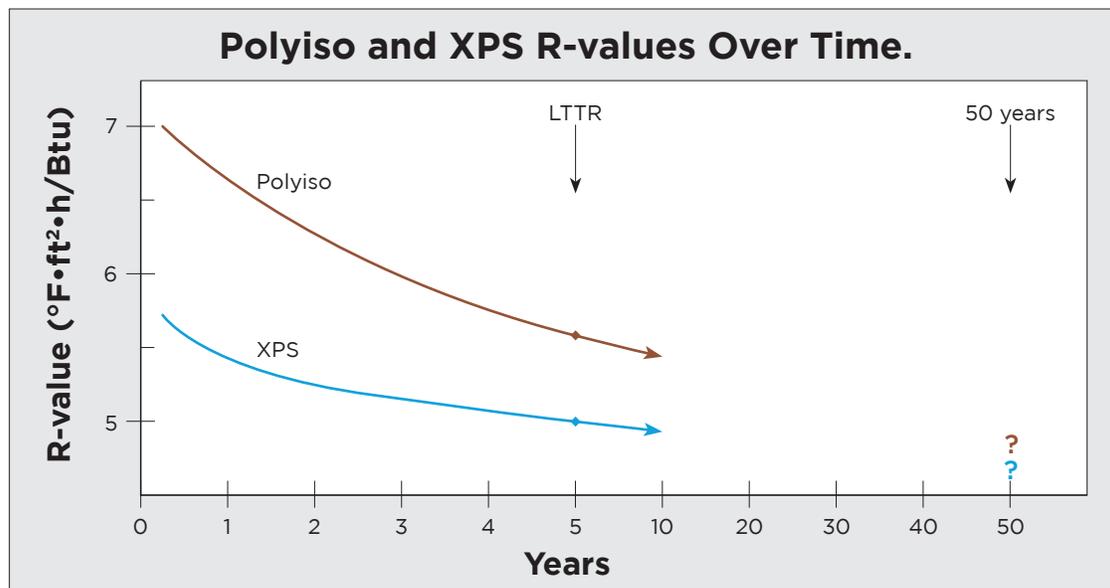
## Unlike Polyiso and XPS, the R-value of Foam-Control MAX is permanent.

Don't Compromise, use insulation that has a permanent R-value for the life of the building.

## Long-Term Thermal Resistance (LTTR) Test Methods.

The concept of predicting the thermal resistance of an insulation over time has evolved considerably in the past decade. Two test methods are commonly used to report R-value for materials with trapped gases other than air. The test methods are ASTM C1303 and CAN/ULC-S770. Both test methods provide a method to estimate the Long-Term Thermal Resistance or long-term R-value of insulations.

Each of the methods involves cutting thin sections approximately 3/8" (10 mm) from a sample of thicker insulation. Due to the thin size of the samples, diffusion of air in and trapped gases out is quicker than for the original thicker sample. The R-value loss of the thin sections can then be used to predict the R-value loss of the original thickness material.





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## LTTR.

The LTTR value commonly published from testing to ASTM C1303 or CAN/ULC-S770 is an estimate for the R-value of the insulation after 5 years. Many insulation manufacturers are promoting LTTR without providing a clear understanding that LTTR is an estimate for the R-value of the material after only 5 years.

The concept of a 5 year R-value being equal to the “time-weighted 15 year average” is also often used by Polyiso and XPS manufacturers. This approach assumes that the higher R-value established in years 1-4 is weighted by the inevitably lower R-value of the insulation in years 6-15. Neither the 5 year R-value, nor the time-weighted 15 year average approach is appropriate for use in building design. This is due to the fact that the R-values of Polyiso and XPS continue to decline below the LTTR published 5 year numbers. Starting in year 5 and for the remaining life of the insulation, the R-values of Polyiso and XPS are below LTTR published R-values.

## 50 Year R-value.

Most insulation users are interested in a true long-term thermal R-value for their insulations. A time period appropriate for building application is 50 years. In order to avoid confusion with the existing LTTR numbers commonly published, we recommend the use of a 50 year R-value be used for insulation specifications.

A 50 year R-value is a more suitable long-term R-value for use in building design. The 50 year R-value can easily be determined using the existing protocol described in ASTM C1303 or CAN/ULC-S770.

**Specify a 50 year R-value for a reliable long-term R-value for building design.**

Specify a 50 year R-value for your insulation R-value to ensure long-term performance and energy savings!

## R-values For Foam-Control MAX, Polyiso, and XPS Insulations.

Insulation	Initial R-value/inch	5 year R-value/inch	50 year R-value/inch
	4.7	4.7	4.7
<b>Polyiso</b>	approximately 7.2	5.6	4.5 <sup>1</sup>
	4.7	4.7	4.7
<b>XPS</b>	approximately 5.5	5.0	4.3 <sup>2</sup>

R-values at 75°F, units are °F•ft<sup>2</sup>•h/Btu  
<sup>1</sup> Estimate based on warranty of 80% of published R-value  
<sup>2</sup> Based on available testing and published research

## Foam-Control MAX Provides a Permanent Lifetime R-value.

The 5 year and 50 year R-values for Foam-Control MAX are the same as the initial R-value since the gas trapped in the cells of Foam-Control MAX is atmospheric air. Unlike Polyiso and XPS, Foam-Control MAX does not lose R-value over time.

## Foam face-off: Choosing Foam-Control MAX over Polyiso and XPS.

- Foam-Control MAX powered by graphite provides a stable long-term high R-value at a lower cost
- Foam-Control MAX uses a blowing agent with low global warming potential and low ozone depletion
- Foam-Control MAX meet strength requirements at a lower cost
- Foam-Control MAX, XPS, and Polyiso have resistance to moisture. Foam-Control MAX has a higher vapor permeance leading to superior drying potential
- Foam-Control MAX with **Perform Guard**<sup>®</sup> treatment available to provide termite resistance

## Proven to meet, or exceed, building codes.

Foam-Control MAX is manufactured under an industry leading quality control program monitored by UL and further recognized in UL Evaluation Report UL ER11812-05. Foam-Control MAX meets ASTM C578, "Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation".



# ACH

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## Performance Value.

When you consider all performance characteristics and cost, Foam-Control MAX is your best choice for foam insulation.

Foam-Control MAX has air in its closed cells and therefore has a stable R-value. Many other insulations use blowing agents that cause R-value loss and are harmful to the environment.

Foam-Control MAX has compressive strength to meet specific project requirements.

Foam-Control MAX is manufactured to resist moisture absorption in wetting conditions and release absorbed moisture quickly during drying periods, which means Foam-Control MAX maintains R-value.

## Ready to take control? Start here.

If you're ready to have Foam-Control MAX contribute to your next project, just contact your nearest Foam-Control MAX manufacturer and Technical Sales Representative. We will be happy to give you design consultation, information about Foam-Control MAX products, pricing, and answers to all of your questions.



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