

LONG-TERM THERMAL RESISTANCE

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



Foam-Control PLUS+ has a Permanent Lifetime R-value.

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



**AN ARCHITECTURAL
INSULATION LIKE
NO OTHER**



LONG-TERM THERMAL RESISTANCE

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.

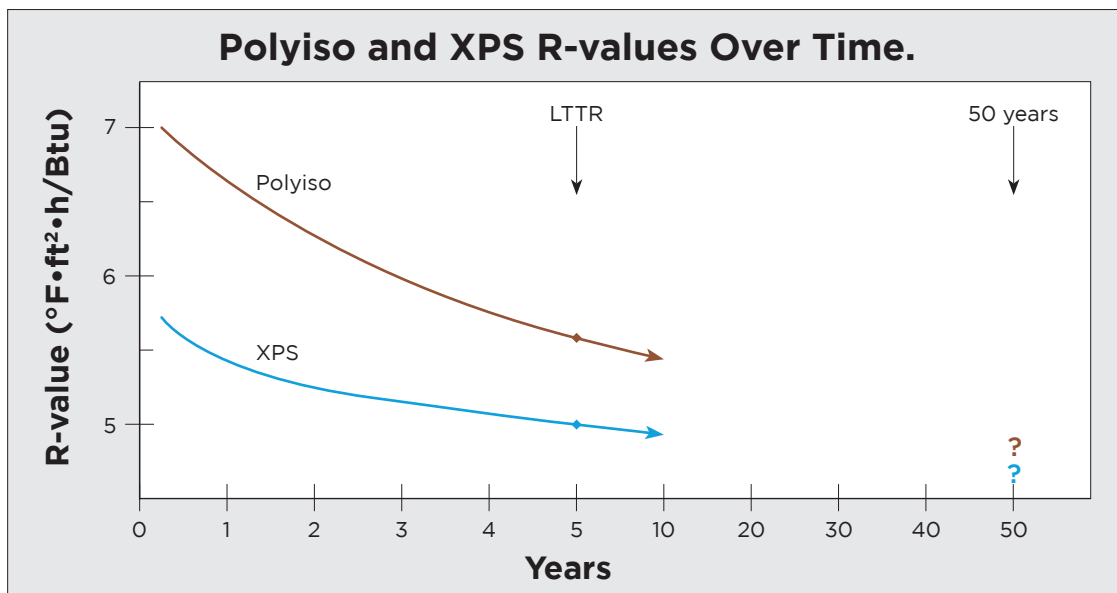
Unlike Polyiso and XPS, the R-value of Foam-Control PLUS+ is permanent.

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.



LONG-TERM THERMAL RESISTANCE

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 PLUS+, Polyiso, and XPS Insulations.

	Initial R-value/inch	5 year R-value/inch	50 year R-value/inch
	4.2	4.2	4.2
Polyiso	approximately 7.2	5.6	4.5 ¹
	4.4	4.4	4.4
XPS	approximately 5.5	5.0	4.5 ²

R-values at 75°F, units are °F•ft²•h/Btu

¹ Estimate based on warranty of 80% of published R-value

² Estimate based on warranty of 90% of published R-value

Foam-Control PLUS+ Provides a Permanent Lifetime R-value.

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

Foam face-off: Foam-Control PLUS+ outperforms XPS and Polyiso.

- Foam-Control PLUS+ provides more R-value at a lower cost
- XPS and Polyiso use blowing agents that cause R-value loss over time
- Polyiso loses R-value during cold and extreme high temperature exposure
- Foam-Control PLUS+ has a stable long term R-value
- Foam-Control PLUS+ available in 15, 25, 40, and 60 psi strengths at a lower cost
- XPS has shown to take on moisture in building applications where water is present and has a low potential to dry.
- Foam-Control PLUS+ has a superior drying potential
- Foam-Control PLUS+ is more vapor permeable to help avoid moisture problems

Proven to meet, or exceed, building codes.

Foam-Control PLUS+ is manufactured under an industry leading quality control program monitored by UL and further recognized in UL Evaluation Report UL ER11812-04.



Foam-Control PLUS+ meets ASTM C578, "Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation".

Performance Value.

When you consider all performance characteristics and cost, Foam-Control PLUS+ has the best performance value of any commercially available foam insulation.

Foam-Control PLUS+ has a wide range of compressive strengths to meet specific project requirements.

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

Ready to take control? Start here.

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

ACH

FOAM TECHNOLOGIES

WWW.ACHFOAM.COM



Foam-Control PLUS+ products are manufactured by AFM Corporation licensees.

Copyright © 2017 AFM Corporation. All rights reserved. Printed in USA. Foam-Control, Perform Guard, and Foam-Control PLUS+ logo are trademarks of AFM Corporation, Lakeville, MN.

PLUS+ is a registered trademark of ACH Foam Technologies, Inc., Denver, CO.

ICC ES logo is a registered trademark of ICC Evaluation Service, Inc.

UL logo is a registered trademark of UL LLC.

USGBC logo is a registered trademark of U.S. Green Building Council.

FCP37-03/17



AN ARCHITECTURAL
INSULATION LIKE NO OTHER