Neopor®
Innovation in Insulation

Neopor® is Powerful Insulation

And the essential ingredient in many powerful building materials



BASF
The Chemical Company

Neopor® is the key ingredient to improving the performance of these applications and more:

- Rigid Foam Panels
- Insulated Siding
- EIFS & Stucco
- Structural Insulated Panels (SIP)
- Insulating Concrete Forms (ICF)
- Pre-Cast & Tilt-Up Walls
- Insulated Window & Door Headers
- Vinyl & Fiberglass Windows
- Entry Doors
- Garage Doors
- Radiant Flooring

NEOPOR® IS THE VERSATILE AND STABLE RIGID INSULATION CHOICE

Neopor® is graphite polystyrene rigid foam with unique insulation properties. With BASF patented Neopor, it is possible to cost-effectively achieve high and stable R-value with rigid foam insulation that is thinner than traditional white EPS and does not lose or change R-value over time like other rigid insulations. Neopor rigid foam is semi-permeable and breathable with superior drying capabilities in above or below grade applications. With appropriate facings, it drains bulk rainwater and allows potentially 'trapped' moisture to dry out.

Insulation experts specify durable and versatile Neopor in all polystyrene insulation applications. This highly adaptable foam can be cut or formed into just about any shape without compromising performance. Builders can rely on building products made with Neopor to support sustainable building practices. Contractors use insulated sheathing made of Neopor for above or below grade continuous insulation. Structural Insulated Panels made with Neopor provide superior energy efficiency in walls and roofs. Whatever your role or insulation application, Neopor is the smart choice.

Neopor® Rigid Thermal Insulation is today's energy efficient and cost-effective insulation solution for architects, building owners, builders and contractors.



STABILITY AND DURABILITY

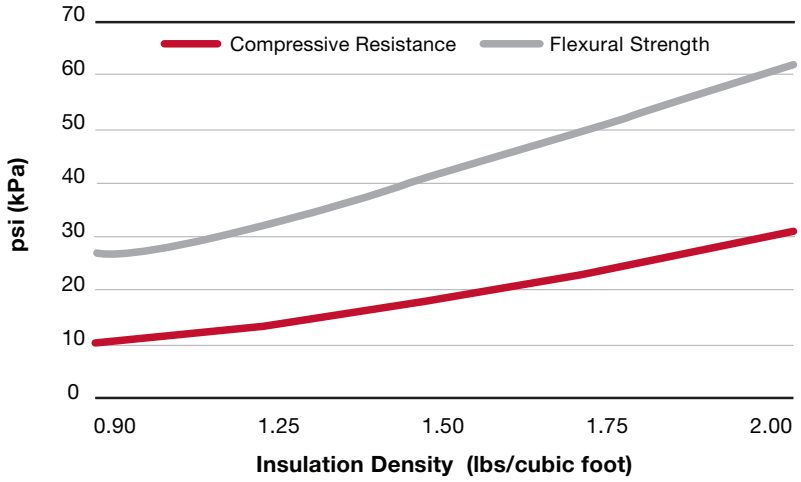
Neopor® Stands for Strength

Neopor® is adaptable in size, thickness, shape and density. This means you can specify the thickness you need.

Neopor is versatile. It has numerous applications in building and construction, packaging, cold storage, and more. The material can be shaped or formed to the design needed. It can be wire-cut to incorporate water drainage channels or precisely manufactured for insertion into window frames. Neopor can also be shape molded with corners, bulk-water management grooves and interlocking features "built-in" such as the interlocking features of Insulated ICF's made of Neopor.

And, since Neopor can be produced in any density between 0.80 lbs/ft^3 and 3 lbs/ft^3, Neopor lets insulation manufacturers select the density which affords them the strength and the R-value they need.

Density, strength and R-value—the designer is in charge.







Photos courtesy of Michael Fredericks

Installation of R-50 Structural Insulated Panels made with Neopor® on the first certified Passive House in New York State, the Hudson Passive Project.

Architect: BarlisWedlick Architects, LLC
Builder: Bill Stratton Building Co.
Panels: Vermont Timber Frames
Neopor® Insulation: Opco, Inc.



NEOPOR® ‘POWERS UP’ WHEN IT GETS COLD OUTSIDE

Gray Neopor® is comprised of many small pockets of air within a polymer matrix containing graphite. The graphite reflects radiant heat energy like a mirror, increasing the material’s resistance to the flow of heat, or R-value.

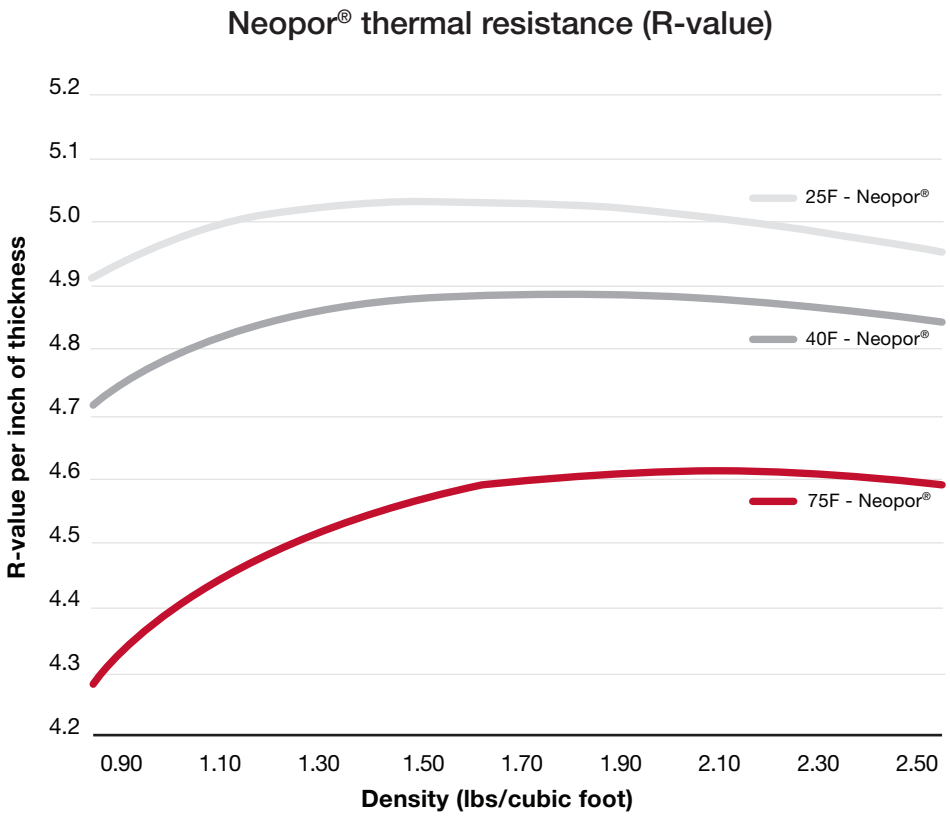
Most polymer-based foams exhibit a greater ability to slow the movement of heat as the temperature decreases. Neopor is in a unique class because it increases in R-value as the temperature outside drops.

In fact, Neopor insulation maintains its ability to slow the movement of heat energy, year after year because it sustains its R-Value. Compared to polymer-based foams like extruded polystyrene that use fluorocarbons as an expansion agent and insulating gas, Neopor uses air. This means Neopor maintains its R-value performance at its original level and does not deteriorate over time, a phenomenon called ‘Thermal Drift’.

This, and the material’s other unique attributes, leads to its choice as a specified ingredient in a variety of higher efficiency insulation products and highly engineered components.

Neopor® R-value is certified by the National Fenestration Rating Council (NFRC)

Window, door, sunroof and other manufacturers use Neopor to improve the thermal properties of their products as tested by an independent third-party laboratory, using testing methods prescribed by the National Fenestration Council.



NEOPOR® IS THE PERFECT GATEKEEPER FOR MANAGING MOISTURE

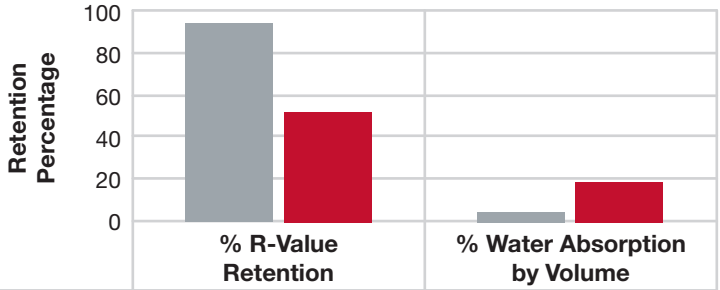
An ideal insulation material has both the ability to shed bulk water and allow water to pass through it. Neopor® Rigid Thermal Insulation does both—and maintains a significant proportion of its original R-value even after extensive contact with water.

Neopor is a breathable and semi-permeable material. As an assembly component or stand alone application, it provides an opportunity for moisture to 'dry out'.

For panels of the same thickness, Neopor (unfaced or faced with a material of equal or higher vapor permeability), supports conveyance of water vapor at a rate greater than XPS or Polyiso can demonstrate.

Vapor Permeability

In-Situ R-Value Retention & Water Absorption



	% R-Value Retention	% Water Absorption by Volume
Polystyrene Type I (1.0 pcf)	94	4.8
XPS Type X (1.6 pcf)	52	18.9

2013 Independent Test of Expanded Polystyrene referenced in March 2014 Technical Bulletin - EPS Industry Alliance





Halfback® H2O photograph courtesty of Progressive Foam Technologies, Inc.
www.progressivefoam.com

Neopor® allows water vapor to move through it and can help mitigate the risk of damage associated with condensation and water vapor inside wall cavities.

A major advantage of Neopor® lies in the reduced use of raw materials, generating savings in terms of costs and resources, which in turn relieves pressure on the environment.

- The use of Neopor reduces energy expended for heating and cooling interior spaces.
- No fluorocarbons are used in the manufacture of Neopor Rigid Thermal Insulation
- Neopor Rigid Thermal Insulatoin has Low Global Warming Potential.
- Neopor Rigid Thermal Insulation can be recycled and reused, eliminating hauling and landfill fees and related impact on the environment.

Neopor exhibits ZERO Ozone Depletion Potential

Neopor insulating materials do not contain fluorocarbons (CFCs, HCFCs or HFCs) or other halogenated cell gases.

Neopor® & LEED®

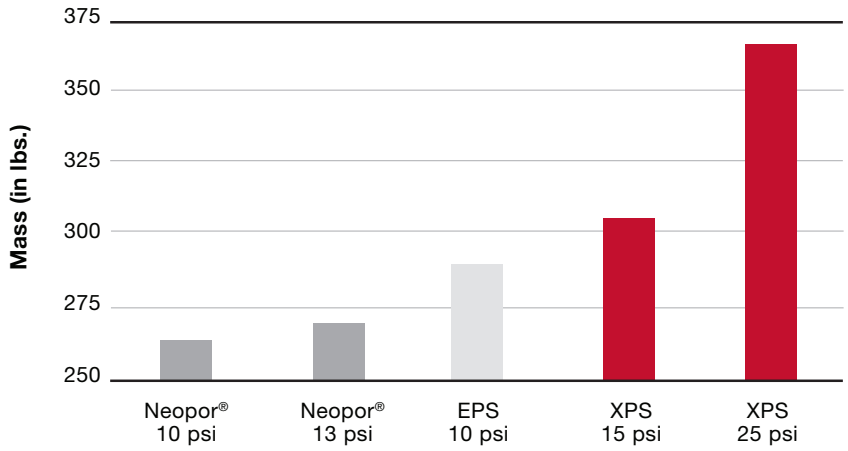
Energy performance above that prescribed in ASHRAE 90.1 is the single largest point scoring opportunity in the LEED® Green Building System. Neopor® used as thermal insulation enables buildings to achieve LEED energy efficiency design goals and standards.

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SPECIFYING AND USING NEOPOR® MEANS USING RESOURCES MORE WISELY

Specification of Neopor® can lead to 10-25% material savings compared to conventional EPS and XPS. The chart below illustrates the mass in lbs. of various R-5 rigid insulation materials required for a typical 2,000 sq. ft. building (continuous insulation, 75% of exterior surface with 9 ft. tall exterior walls).

Mass of R-5 continuous insulation required using rigid foam in a typical residence.



NEOPOR® MEETS STRINGENT PERFORMANCE STANDARDS

GREENGUARD Gold Certified for Indoor Air Quality.

Neopor® has achieved GREENGUARD Gold certification by UL Environment for products with low chemical emissions.

The products that we use to build our indoor environments can have a significant impact on indoor air pollution levels. Products that have achieved GREENGUARD Certification are scientifically proven to meet some of the most rigorous, third-party chemical emissions standards—helping reduce indoor air pollution and the risk of chemical exposure while aiding in the creation of healthier indoor environments.

Neopor® Rigid Foam Insulation is proven to perform.

An innovation in insulation from BASF, Neopor® Rigid Thermal Insulation complies with ASTM E-84, UL-723, UL S102.2; meets ASTM C-578 Type I, VIII, II, II (1.45 lbs/ft^3), IX and CAN/ULC S701 Type 1,2,3 requirements and is listed in NFRC 101 for use in fenestration products. Neopor Rigid Thermal Insulation is described in ICC-ES ESR 3463, listed with UL and UL Canada, listed on the QAI Laboratories Material Directory and in NFRC 101. The use of Neopor can earn points under the LEED Energy Performance Process.

WHY DO INSULATION EXPERTS SPECIFY NEOPOR® INSULATION?

Features:	Benefits:
Durable gray Neopor foam is **adaptable** in shape, size and density, **versatile** in its use and **cost effective** to manufacture, source, adapt and install.	Neopor can be specified as a monolithic board in nearly any thickness up to 48" wide. A specific R-value can be 'engineered-in' by simply specifying the density and thickness of Neopor insulation.
Neopor has a long-term **stable R-value.**	The energy savings expected from the use of Neopor insulation will not decline over time as a result of fluorocarbon migration or inability to release water.
Neopor is formulated for o**ptimal water management for all four real-life water management concerns** – bulk water, vapor permeability, water absorption, water release.	Neopor helps reduce the risk of mold, rot and structural damage associated with moisture condensation and long-term water retention within insulation.
Neopor® Rigid Thermal Insulation is produced under BASF **Quality Guidelines** and marked with the Neopor **Ingredient Brand**.	Consistent insulation quality are identifiable, by the Neopor trademark.

NEOPOR® PHYSICAL PROPERTIES FOR USA

			Insulation Density				
Properties	Method	Units	1.00(1)	1.15	1.35	1.45	1.80
Compressive Resistance	ASTM D1621	at yield of 10% deformation in psi (kPa)	11 (76)	13 (90)	15 (104)	17 (117)	25 (173)
Thermal Resistance , 75F	ASTM C518	per inch of thickness in °F·ft²·h/BTU (°C·m²/W) 75 ±2°F (23.9 ±1°C)	4.3	4.5	4.5	4.6	4.6
Thermal Resistance, 40F	ASTM C518	per inch of thickness in °F·ft²·h/BTU (°C·m²/W) 40 ±2°F (4.4 ±1°C)	4.7	4.8	4.9	4.9	4.9
Thermal Resistance, 25F	ASTM C518	per inch of thickness in °F·ft²·h/BTU (°C·m²/W) 25 ±2°F (-3.9 ±1°C)	4.9	5.0	5.0	5.0	5.0
Flexural Strength	ASTM C203	psi (kPa)	25 (173)	30 (207)	35 (241)	40 (276)	50 (345)
Water Vapor Permeance(2)	ASTM E96	For 1" (25.4 mm), perm (ng/Pa·s·m²), max	5.0	3.5	3.5	3..5	2.5
Water Absorption by Total Immersion	ASTM C272	Volume % absorbed, max	3.0	2.5	2.5	2.0	1.5
Dimensional Stability	ASTM D2126	max % linear change	< 1.5				
Oxygen Index	ASTM D2863	volume %	> 24				
Surface Burning Characteristics	ASTM E--84 or UL 723	Flame Spread / Smoke Developed	Flame Spread <25, Smoke Developed <450				
Biological Behavior			No harmful effects on health known.				
Chemical Resistance			Insensitive to water, the majority of acids and alkalis; sensitive to organic solvents.				
Application Limiting Temperature		° F / ° C	165 (73.9)				
ASTM C--578 Type*			I	VIII	II	II	IX

(1) Properties at 1.00 lb/ft³ density achievable with Neopor® 5300.
(2) Values quoted are maximum values for 25mm thick samples. Lower values will result for thicker materials. Where water vapour permeance is a design concern, consult the manufacturer of the finished good made of Neopor Insulation
The physical property data shown above are presented as typical average values as determined by industry accepted and standard test methods, except where noted, and are subject to normal manufacturing variation.
*ASTM C578, "Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation"; published by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959.

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Neopor® is Powerful Insulation

- Neopor® is a gray and durable rigid foam comprised of air within a special polymer matrix containing high purity graphite.
- This combination of stable materials gives Neopor rigid foam insulation unique properties as an insulation material.
- Versatile and adaptable Neopor rigid foam insulation can be used as a cost-effective stand-alone rigid foam board for continuous exterior or below-grade insulation, in roofs, within concrete, as the core of a Structural Insulated Panel, as an Insulating Concrete Form, behind siding, masonry or EIFS … or as the insulation material in multi-component building products.

Neopor® is an Ingredient Brand

- Neopor® rigid foam insulation is produced, in North America, under a BASF Neopor Brand Marketing Program, by converters who convert Neopor raw material from BASF to rigid foam under BASF Quality Guidelines.
- Rigid foam boards and finished goods which use Neopor as insulation are marked with the Neopor trademark. This 'Ingredient Brand' is evidence that Neopor from BASF is inside the building product, powering its insulation performance.

ESR 3463
ESR 2784

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