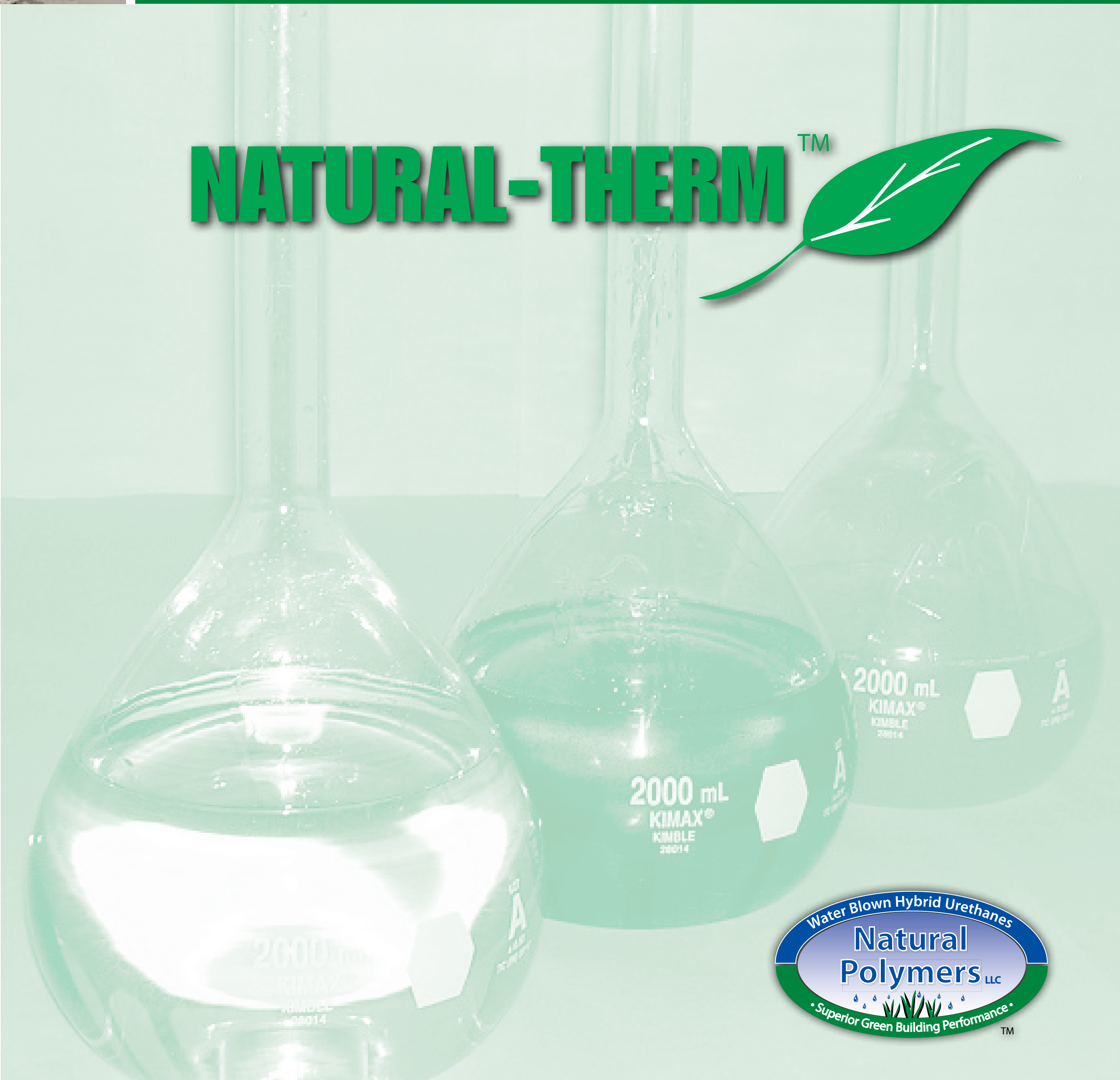
Natural Polymers, LLC

Natural Choice Polymer Design



NATURAL-THERM™

Water Blown Hybrid Urethanes

Natural Polymers LLC

Superior Green Building Performance™

www.naturalpolymersllc.com

Natural Polymers mission is to design exceptional polyurethane foam systems that utilize Nature's polymers. Our Polymer Chemistry is different from other Bio and Agri based systems. We use a proprietary process designed to maximize the polymers that Nature has made. Natural Polymer's Water Blown Hybrid Urethane Technology has one of the highest biological raw material bases in the industry, with the lowest amount of embodied energy in the finished product. We feel that it is our responsibility to reduce our carbon footprint through innovative technology and to push the envelope of design and chemistry.

Traditional Polymer Chemistry is based solely on propylene oxide (PO) and ethylene oxide (EO), which are petroleum-based building blocks. Other companies have tried to develop Bio and Argi based foams by replacing small percentages of the petroleum components with vegetable based polyols, which in many cases still rely heavily on petroleum-based raw materials. This results in finished products that are still greater than 90% petroleum based.

The products made by Natural Polymers are different. We reduce the amount of petroleum by 15-30%, but still maintain the performance and physical properties of a 100% petroleum based system. Through innovative and exciting research and development, Natural Polymers has accomplished what has been an elusive goal in the polymer industry.

NATURAL-THERM™ 0.50 PCF Semi Ridged Polyurethane Foam Insulation
NATURAL-THERM™ 1.0 PCF Semi Ridged Polyurethane Foam Insulation
NATURAL-THERM™ 2.0 PCF Ridged Polyurethane Foam Insulation
Water Blown Hybrid Insulation
Re-defining green building technology for the Polyurethane Industry.
www.naturalpolymersllc.com

Overview:

Many people are confused as to which type of spray polyurethane foam insulation (SPF) they should use. A common debate when trying to choose the right type of (SPF) occurs when the terms open cell and closed cell are introduced. Usually people search for answers on web sites or through local insulation contractors. Depending on where the information comes from, a bias for one type insulation over another usually forms.

Not all spray polyurethane foam insulations (SPF) are the same. If you are just becoming familiar with (SPF), you will soon recognize the terms open cell and closed cell. Sometimes they are referred to as open cell or 0.50 lb/ft3 (pcf), or closed cell 2.0 lb/ft3, pcf. There are differences between open and closed cell (SPF). Your choice may depend on your climate and geographic area. Some people believe that closed cell (SPF) is superior to open cell (SPF); while others feel just the opposite. An argument can be made on either side, depending on the particular application. In applications where water permeability and water absorption are a concern, usually a closed cell (SFP) is preferred. In applications where a breathable membrane is required, then open cell (SPF) is more preferable.

However, there are several other factors, which affect spray polyurethane foams (SPF) performance. This brochure outlines the most common differences by comparing the physical properties associated with each (SPF). It also highlights a less well-known class of (SPF), which some refer to as a hybrid spray foam insulation. Hybrid foam insulation is in the middle density range and has both open cell and closed cell properties. This mid density spray foam insulation is a 1.0 lb/ft3, (pcf) density.

1.0 PCF

0.50 PCF

2.0 PCF

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Formulation Laboratory

Physical Properties:

American Society for Testing Materials (ASTM) is an international standards organization that develops and publishes technical standards for a wide range of products important to the building and construction industry. Required tests and standards for all low-density 0.50 pcf, 1.0 pcf and higher density 2.0 pcf foam plastic insulation are as follows.

•Density (ASTM D-1622)

•Closed cell content (ASTM D-2856)

•Open cell content (ASTM D-6226)

•Compressive strength (ASTM D-1621)

•Tensile strength (ASTM D-1623)

•Thermal conductivity (ASTM C-518)

•Water Vapor Permeance (ASTM E-96)

•Dimensional stability cold aging (ASTM D-2126)

•Dimensional stability dry aging (ASTM D-2126)

•Dimensional stability humid aging (ASTM D-2126)

Process Laboratory

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Microscopy

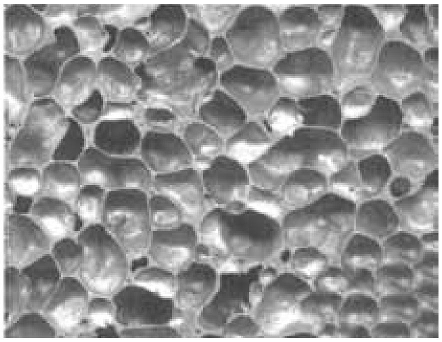
Density (ASTM D-1622):

The density of polyurethane foam insulation is defined as the weight of foam per unit volume. Measured in lbs/ft3 or pcf the density range is from 0.50–2.0 pcf.

ASTM D-2662 Lbs./ft3	**Natural-Therm™ 0.50 PCF**	**Natural-Therm™ 1.0 PCF**	**Natural-Therm™ 2.0 PCF**
Average density of four samples:	0.49 lbs./ft3	1.29 lbs./ft3	1.89 lbs./ft3
PRI and Intertek third party accredited testing laboratory using ASTM D-2662 conducted all testing.			

Closed Cell Content (ASTM D-2856):

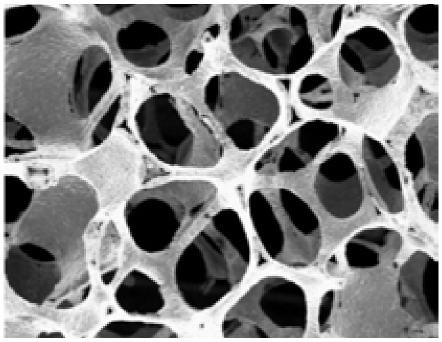
Closed cell content (ASTM D-2856)) is the measurement used to define the number of intact cell membranes (windows) that prevent no open passageways for airflow. Rigid closed cell foams have greater than 90% of the cell windows closed.



Closed Cell Foam

Open Cell Content (ASTM D-6262):

Open cell content (ASTM D-6262) is the measurement used to define the number of broken cell membranes (windows) that allow air passageways for airflow. Open cell foams will have greater than 90% of the cell windows open.



Open Cell Foam

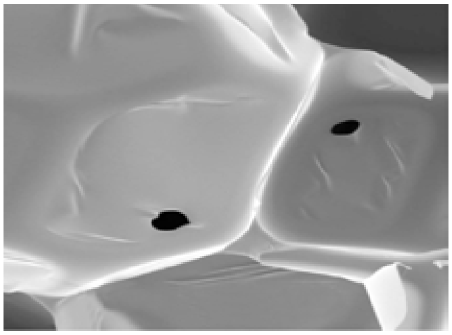
Pycnometer Air Flow Test

Device used to determine open or closed cell content

Natural-Therm™ 1.0 PCF Hybrid Foam:

Unlike other low-density 0.50-pcf spray foams, Natural Polymers, LLC has developed a mid density 1.0 pcf spray foam insulation, which has a finer cell size and a smaller opening in the cellular window. This allows for improved R-Values and superior dimensional stability.

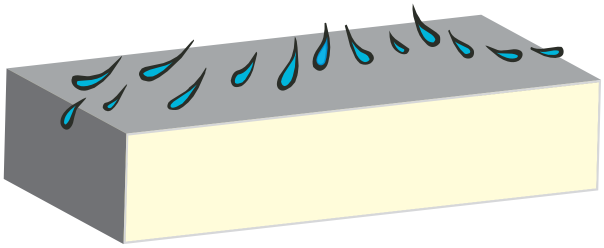
A smaller cellular window also allows for better water vapor permeance than low density 0.50 pcf (SPF). Hybrid foam does not absorb water when exposed to moisture. If moisture becomes trapped between the foam surface and the substrate, the foam has a high enough permeability to allow trapped moisture to transfer through the foam and dry out over time. Natural-Therm™ Hybrid foam acts like a breathable membrane system as opposed to closed cell foams that don't allow for moisture mitigation.



Hybrid Foam

In applications where increased structural strength, low water vapor permeance, a higher R-Value per inch, and an overall tighter cell structure is desirable, then the Natural-Therm™ 1.0 PCF Hybrid SPF is the superior product.

Natural-Therm™ Series 1.0 PCF Hybrid foam is preferred in applications such as the underside of a roof decks or closed wall cavities. Because of the unique cellular design, if a leak in the building envelope does occur, the leak will either be detected or have a chance to dry out over time. In these applications, there is less concern about condensation or vapor drive into Hybrid open cell foams. It has been well documented by Independent National Laboratories that over 90% of vapor drive is through air infiltration not the insulation permeability rating. An effective air barrier will stop 90% of condensation or vapor drive, while the unique cellular structure of Natural-Therm™ Hybrid foam will help stop the rest.



Hybrid foams are water resistant

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Universal Testing Equipment

Tensile Strength (ASTM D-1623):

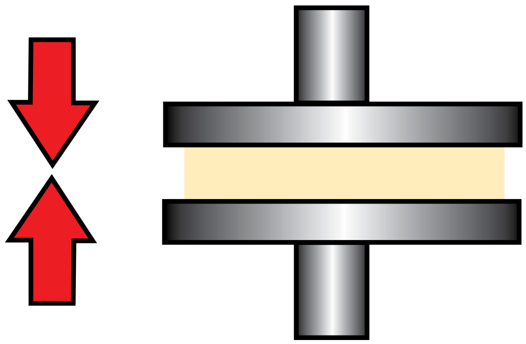
Tensile strength is a measure of the amount of stress required to break foam as it is pulled apart and is expressed in pounds per square inch (psi).

Natural-Therm™ 0.50 PCF	**Natural-Therm™ 1.0 PCF**	**Natural-Therm™ 2.0 PCF**
Tensile Strength	Tensile Strength	Tensile Strength
4.64 psi	21.22 psi	21.24 psi
Intertek a third party accredited testing laboratory using ASTM D-1623 conducted all testing.		

Compressive Strength (ASTM D-1621):

Definition: A test used to determine the value of maximum compressive force. Using a Universal Testing Apparatus a foam specimen is placed between two steel plates and compressed to a 10% deflection (90% original thickness). A pounds per square inch (psi) value is then determined.

Natural-Therm™ 0.50 PCF	**Natural-Therm™ 1.0 PCF**	**Natural-Therm™ 2.0 PCF**
Compressive Strength	Compressive Strength	Compressive Strength
1.2" psi @ 70ºF	15 psi @ 70ºF	22 psi @ 70ºF
Intertek a third party accredited testing laboratory using ASTM D-1621 conducted all testing.		



Compressive Strength

Blower Door Test

Air Barrier ASTM E-283:

This test method is standard procedure for determining the air leakage characteristics under specified air pressure differences at ambient conditions.

Natural-Therm™ 0.50 PCF	Natural-Therm™ 1.0 PCF	Natural-Therm™ 2.0 PCF
Air Barrier	Air Barrier	Air Barrier
5.5" is an air barrier	3.5" is an air barrier	1.5" is an air barrier
Intertek a third party accredited testing laboratory using ASTM E-283 conducted all testing.		

Thermal Conductivity (ASTM C-518):

R-value is a laboratory-generated value. R-value does not factor in the other major conditions that affect an insulation's performance. Some primary factors that can affect a material's insulation performance are: wind velocity, convection, openings, cracks, and pressure differential between the inside and outside of a building. Natural-Therm™ spray foam insulation addresses these major performance factors. It does this by inhibiting convection loops, reducing conduction and radiation from high energy sunlight.

1. Conduction is the transfer of thermal energy between neighboring molecules in a substance due to a temperature gradient.

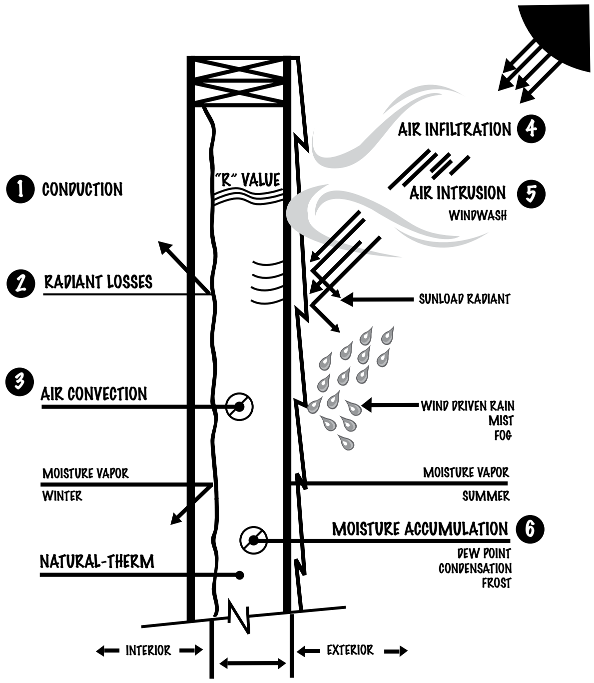
2. Radiation is electromagnetic waves that directly transport energy through space.

3. Convection is the transfer of heat within fluids (i.e. liquids, gases inside the polymers matrix) by the actual movement of the matter.

4. Convection in the form of air infiltration into a closed wall cavity transfers heat through gaseous air.

5. Convection in the form of liquid water washing against the building envelope helping create a pressure differential.

6. Moisture drive into a wall cavity can cause further diminishing of actual R-values in traditional insulation materials.



Natural-Therm helps to create an Air Barrier Isolation System

R-Value Testing Apparatus

Thermal Conductivity (ASTM C-518):

K factor machine –HFM (heat flow meter)

K factor is a measure of the thermal conductivity of the foam.
R value is a measure of the thermal resistance of the foam.

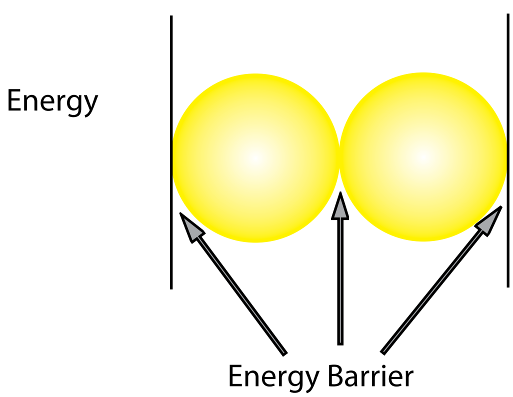
Stationary Top Plate (cold ~55°F)

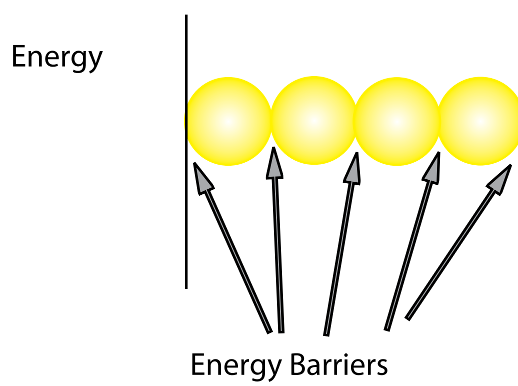
Moving Bottom Plate (hot ~95°F)
Heat Flows from the bottom plate through a foam sample to the top plate

Thermal Conductivity (ASTM C-518):

ASTM C-518	Natural-Therm™ 0.50 PCF	Natural-Therm™ 1.0 PCF	Natural-Therm™ 2.0 PCF
1”	3.81	4.80	6.51
3”	14.31	14.26	20.23
4”	16.76	19.33	25.94
By law reported R-values are required to be third party test.			

How Polymer Insulation works on a cellular level to reduce heat flow.





- ⇨ The Polymer interface serves as an energy barrier
- ⇨ Polymers collide against the interface and energy is transferred through the polymer and to molecules in the neighboring cell
- ⇨ Smaller cells ⇨ Larger number of cells
  - ⇨ More energy barriers
    - ⇨ Lower rate of heat transfer

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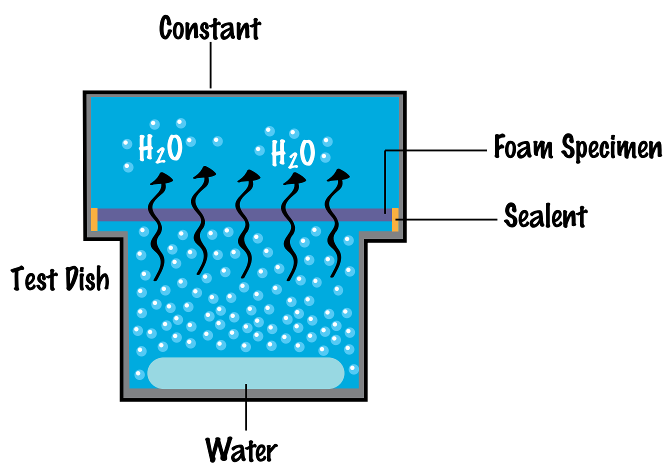
Foam Specimen in Water

Water Vapor Permeance (ASTM E-96):

A laboratory test designed to simulate the rate of water vapor infiltration through construction materials and membranes. In the laboratory a sample is placed in a device that has two chambers, one that controls temperature and humidity and another where a desiccant maintains humidity at or near zero.

Note: As density decreases the water absorption increases. As a result open cell foams are more hydrophilic (water loving) than closed foams. Closed cell foams have a low water vapor perm and therefore are considered more hydrophobic (water repelling). Natural-Therm™ 1.0 PCF Hybrid Foam is more hydrophobic (water repelling) than your typical open cell foam. These properties should be taken into consideration when choosing a substrate to spray against.



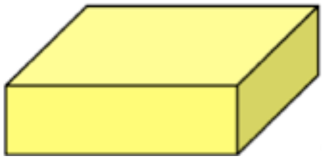
Perm Rating Testing Device

Natural-Therm™ 0.50 PCF	**Natural-Therm™ 1.0 PCF**	**Natural-Therm™ 2.0 PCF**
Water Vapor Permeance	Water Vapor Permeance	Water Vapor Permeance
11.50 perm @ 2”	8.21 perm @ 2”	1.70 @ 2”
7.97 perm @ 5”	3.3 perm @ 5”	<1 @ 2.5”
PRI a third party accredited testing laboratory using ASTM E-96 conducted all testing.		

Dimensional Stability Chamber

Dimensional Stability:

Defination: measured change in dimension when exposed to extreme conditions.
Must meet specification provided in ASTM AC377 standard.
Standard is to test material at -20°F, 158°F 100% Relative Humidity, and 158°F dry air.



Dimensionally Stable

Dimensionally Unstable

ASTM D-2126 (Max 15% volume change) for 128 days averaged of four data points	**Natural-Therm™ 0.50 PCF**	**Natural-Therm™ 1.0 PCF**	**Natural-Therm™ 2.0 PCF**
-20ºF	-0.10	-0.20	-0.90
158ºF 100% R.T. Humidity	-0.40	-0.50	-3.0
158ºF Dry	-0.20	-1.10	5.20
PRI and Intertek third party accredited testing laboratory using ASTM E-283 conducted all testing.			

Dimensional Stability Cold Aging (ASTM D-2126):

Open Cell Content: The more open the cell the better the dimensional stability.
Density: The higher the density the more dimensionally stable the foam.
Cell Structures: The more stretched out or elongated the cell structure the less dimensionally stable the foam.

- •0.50 and 1.0 PCF Low-density open cell foams are stable
- •2.0 PCF Closed cell foams can shrink at low Temp.
- •Closed cell foams use a low boiling point gaseous blowing agent HFC-245fa*. This has a higher global warming potential over all water blown foams.
- •Open cell foams are water-blown, they covert liquid water into $C0_2$.

**Note this is considered a non Ozone depleting system with no global warming potential.*

Measuring Calipers

One way to help improve cold age dimensional stability is to increase the density of the polymer to greater than 2.0 pcf. By increasing the density; the outer cellular wall is thickened allowing the foam to withstand the external atmospheric pressure difference created during the foaming process. As the cellular plastic is formed there is a pressure differential between the inside of the cell and normal atmospheric pressure. If the density of the polymer is not strong enough to withstand this pressure difference the foam will shrink. There are two ways to address this issue. One way is to open the cells, the other way is to increase the density of the polymer to greater than 2.0 pcf.

- For closed cell formulations there is typically a winter and summer grade version.
- The winter grade is higher density.
- Summer grade has a slightly lower density.

Dimensional Stability Dry Aging (ASTM D-2126):

- As ambient temperatures increase 2.0 pcf foam has a tendency to expand and swell.
- Open cell water-blown foams need to reach an equilibrium early in the foaming process. The CO_2 generated during the foaming process needs to escape the newly formed cell at a rate of equilibrium even to the rate at which atmospheric pressure is pushing down on the foam. Unlike closed cell foams where shrinkage may occur later, open cell foams will show shrinkage normally within the first few minutes. Normally if open cell foam has a dimensional stability problem you will detect it right away. With closed cell foam it may be covered with drywall or wood and never be detected.

- Closed cell foams use a low boiling point gas, which has the potential to swell when subjected to higher temperatures.
- Closed cell foams can thermal split from internal heat generated during the exothermic reaction created as the foam rises. Under the right conditions this can become a serious problem compromising the air barrier properties.

Dimensional Stability Humid Aging (ASTM D-2126):

Under high humidity and heat, polyurethane foam can expand and soften. This is not a problem associated with open cell foams as much as it is with closed cell foams. The percent of expansion you will see with an open cell foam is within + or – 2%. In a closed cell foam this can be as much as + or - 5-10%. Note the AC377 code criteria allows for up to a 15% change.

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Fire

Fire Performance (ASTM E-84):

A test which helps to evaluate a building materials surface burning conditions and behavior under laboratory conditions. The test measures the flame spread and smoke developed during a fire. This is an industry standard test used in the building industry also known as:

ANSI 2.5
NFPA 255
UBC 8-1 (42.1)
UL-723

Natural-Therm™ 0.50 PCF	Natural-Therm™ 1.0 PCF	Natural-Therm™ 2.0 PCF
ASTM E-84	ASTM E-84	ASTM E-84
Flame Spread: 15	Flame Spread: 20	Flame Spread: 20
Smoke Developed: 350	Smoke Developed: 400	Smoke Developed: 450
A third party accredited testing laboratory using ASTM E-84 conducted all testing.		

Steiner Tunnel Test

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Fire Performance (NFPA 286):

A test with the objective to evaluate the fire performance of spray–applied, Polyurethane foam (SPF) insulation materials when tested in a room/corner test configuration. This test will determine if the insulation and/or the insulation system is acceptable for use in attics and crawl spaces without a code-prescribed thermal barrier per the International Residential Code® (IRC) or International Building Code® (IBC). This is a timed test with a pass resulting in foams that contain the flames of the fire from exiting the door area within a 4.18 sec minimum time. A 4.18 sec time is the time flames are recorded out the front of the test room when only a 5/8″ plywood panel is used. Foam plastic insulation that can exceed the 4.18 sec minimum time is deemed a pass under the current test criteria.

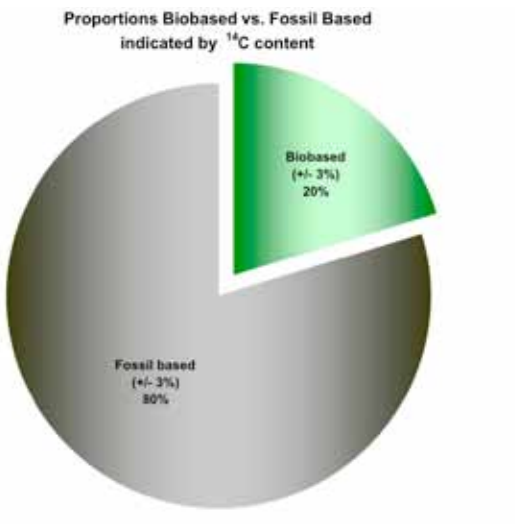
Natural-Therm™ 0.50 PCF	Natural-Therm™ 1.0 PCF	Natural-Therm™ 2.0 PCF
NPFA 286:	NPFA 286:	NPFA 286:
4.18 Pass	4.18 Pass	4.18 Pass
South West Research Institute (SWRI) performed NPFA testing on each of the products listed above. SWRI is a third party accredited testing laboratory using ASTM E-84 conducted all testing.		

NFPA 286 Test

Health and Safety Aspects of Spray Polyurethane Foam

Natural-Therm™ Series Spray polyurethane foam insulation systems (SPFIS) are safe and non-toxic. The SPFIS is produced by reacting hazardous liquid chemicals side A and side B that have certain toxicity characteristics according to the material safety data sheets, and require personal protective equipment when being installed. However, it has shown that after the SPFIS chemicals are mixed and installed according to the manufactures recommendations, that the finished, cured, solid SPFIS product is non-toxic (using industry accepted tests) 24 hours after installation. Liquid SPFIS chemicals are hazardous and must be handled and installed using personal protective equipment. The fully cured solid SPFIS product may not be considered non-toxic until 24 hours after installation.

Natural-Therm™ Series Spray polyurethane foam insulation system (SPFIS) is sold with chemical mixtures pre-packaged into kits two "sides," an "A" side and a "B" side, each side making up 50% of the kit. Twenty percent of the B side is made up of polyols, which are up to 90% recycled or renewable raw materials. The A side is a 100% petroleum based raw material. The A side and B side are mixed at the application site to create the finished foam. After the sides are mixed and the finished foam is produced, the ultimate recycled or renewable content in the SPFIS is between 10-25% as measured using ASTM D6866. Both recycled and renewable contents vary from formulation to formulation. Please refer to testing data provided by the manufacturer.

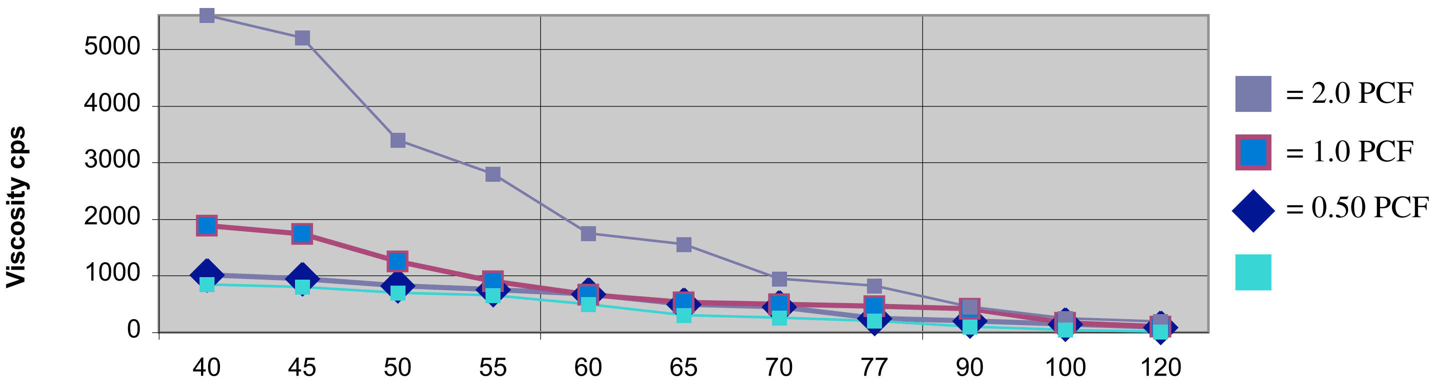


Example: Natural Polymers™ Hybrid 1.0 PCF Test Data

Processing Perimeter:

Hose heaters should be set to deliver between 120°F - 140°F materials to the spray gun. Per-Heaters should be set to five degrees over the desired hose heat setting. Proportioner dynamic pressures should be 1100-1400 psi range. These settings will ensure thorough mixing in the spray gun mix chamber in typical applications. Optimum hose pressure and temperature may vary as a function of the type of equipment, ambient and substrate conditions, and the specific application. It is the responsibility of the applicator to properly interpret equipment technical literature, particularly information that relates acceptable combinations of gun chamber size, proportioner output, and material pressures. The relationship between proper chamber size and the capacity of the proportioner's pre-heater is critical. **CAUTION: Extreme care must be taken when removing and reinstalling drum transfer pumps so as NOT to reverse the "A" and "B" components!!!**

Viscosity vs. Temperature for Natural-Therm™ Series (SPF)



Natural Therm™ Coverage Chart	0.50 PCF	1.0 PCF	2.0 PCF
Average Board Feet	15,000	7,000	4,500

Thermal Barrier

IRC and IBC codes require that SPF be separated from the interior of a building by a thermal barrier, which is applied over SPF to slow thermal rise, and delay its involvement in a fire. A building code definition of an approved thermal barrier is one that is equal in fire resistance to 1/2 inch gypsum board. Thermal barriers limit the temperature rise of the underlying SPF to not more than 121°C (250°F) after 15 minutes of fire exposure in compliance with ASTM-E119 (Test Methods for Fire Tests of Building Construction Materials). Thermal barriers meeting this criteria are termed a "15 minute thermal barrier" or classified as having an "index of 15". Natural Polymers recommends that an approved thermal barrier separate Natural-Therm™ Series Spray Foam from the building interior unless waived by a local building code official. There are exceptions to the thermal barrier requirement: (1) Code authorities may approve coverings based on fire tests specific to the SPF application. For example, code authorities in lieu of a thermal barrier may approve covering systems that successfully pass large scale tests; (2) SPF protected by 1" thick masonry does not need a thermal barrier. Certain materials that offer protection from ignition, called "ignition barriers," may not be considered as thermal barrier alternatives unless they comply with ASTM E-119. Just because a material is advertised as a "thermal barrier" or "ignition barrier" does not mean that it has been tested in conjunction with SPF and approved by a code agency or a local code official. Applicators should request test data and code body approvals or other written indications of acceptability under the code to be sure that the product selected offers code-compliant protection.

Conditioned Attic Assemblies

Unvented conditioned attic assemblies are permitted under the following conditions. The air impermeable insulation is applied in direct contact to the underside of the roof deck. Air impermeable insulation is evaluated using ASTM E-283. Natural-Therm™ insulation has been evaluated using ASTM E-283. Depending on the zone you live in, the average temperature of the condensing surface needs to be above a certain level. In zone 3 through 8 the average temperature needs to be above 45F. This average temperature is the interior surface of the air impermeable insulation. The average interior surface temperature depends on the R-value of the insulation and the average thickness of the insulation. Please reference the R-value chart on the Natural-Therm™ data sheets for more information.

Vapor Retardant

Natural-Therm™ Series Spray Foams are intended for indoor applications, and may not perform as vapor retarders. Natural-Therm™ 0.50 pcf and 1.0 pcf are vapor permeable and will allow some diffusion of moisture through the insulation. The following considerations are needed: (1) A vapor retarder needs to be considered in the design of the building envelope in cold climates, such as zones 6 and higher in the U.S., as defined in 2004 Supplement To The IRC, Table N1101.2; (2) A vapor retarder also needs to be considered where high interior humidity conditions exist; (3) When applying Natural-Therm™ Series Spray Foam in crawl spaces under living space, the underside of floor system may require the application of vapor retarder primer to prevent moisture diffusion into the flooring system. This is a concern when applying in warm, humid climates as defined in 2004 Supplement To The IRC, Table N1101.2.1; (4) The applicator should consider a vapor retarder in crawl space applications with hardwood floors, which may be damaged by moisture intrusion. Where exposed rim joist applications are approved, vapor retarder criteria must be strictly adhered to for successful application. Refer to local codes and manufacturer's written specifications to ensure compliance.

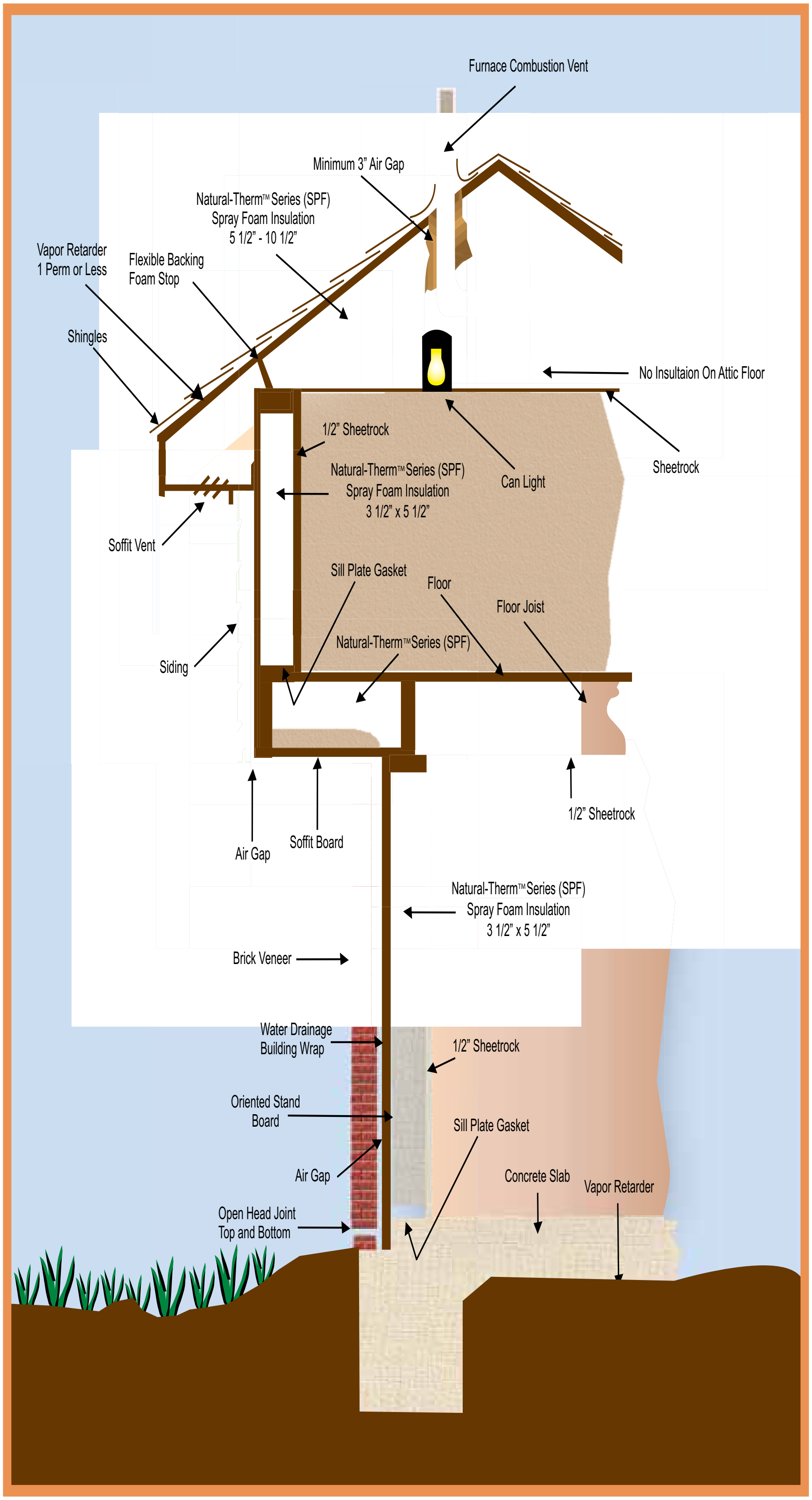
Exothermic Reaction

SPF liquid to cellular plastic transition depends upon an exothermic (heat- producing) reaction between the "A" and "B" components. Applicators should limit Natural-Therm™ Series Spray Foam thickness to 2" per pass to avoid fire hazards resulting from excessive heat generation. If subsequent passes are needed, applicators should wait 10 to 15 minutes between passes to allow reaction heat to dissipate. The exothermic reaction can cause temporary substrate thermal rises in excess of 150°F, which may result in substrate thermal expansion. If the substrate then contracts when the reaction heat dissipates, substrate deformation can occur.

Summary:

There is no doubt the debate will continue as to which product is a superior insulation. Based on the results of this brochure you can now do a side by side comparison of the different properties that are used in the industry to classify spray foam insulation. These industry tests are designed to insure the integrity of the products being used. If you are looking for a more flexible membrane system that is also a breathable air barrier then either the 0.50 pcf or 1.0 pcf is the right insulation for the job. If the insulation is required to be in direct contact with water, needs structural strength, or is being used in a restricted cavity were a higher R-value is required, the appropriate choice would be a closed cell 2.0 pcf spray foam insulation.

Closed Cell	**Open Cell**
Highest insulating "R-Value" per inch (> 6.0)	Good insulation value (R = 3.5-4.8)
Low vapor permeability, vapor barrier at 2”.	Higher vapor permeability, but controlled at 3-6”.
Air barrier	Air barrier at full wall thickness
Increases wall strength	1.0 pcf has some wall strengthening characteristics.
Resists water (is a WRB – "Water Resistive Barrier")	1.0 pcf can resist water.
Medium density (1.75 – 2.25 lbs./ft3)	Low density (0.4 – 1.2 lbs./ft3)
Absorbs sound, especially bass tones	Best sound absorption in normal noise frequency ranges
Low yield	Economical yield


Furnace Combustion Vent
Minimum 3" Air Gap
Natural-Therm™ Series (SPF)
Spray Foam Insulation
5 1/2" - 10 1/2"
Vapor Retarder
1 Perm or Less
Flexible Backing
Foam Stop
Shingles
No Insultaion On Attic Floor
1/2" Sheetrock
Natural-Therm™ Series (SPF)
Spray Foam Insulation
3 1/2" x 5 1/2"
Can Light
Sheetrock
Soffit Vent
Sill Plate Gasket
Floor
Floor Joist
Natural-Therm™ Series (SPF)
Siding
1/2" Sheetrock
Air Gap
Soffit Board
Natural-Therm™ Series (SPF)
Spray Foam Insulation
3 1/2" x 5 1/2"
Brick Veneer
Water Drainage
Building Wrap
1/2" Sheetrock
Oriented Stand
Board
Sill Plate Gasket
Air Gap
Concrete Slab
Vapor Retarder
Open Head Joint
Top and Bottom



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