



### Typical Physical Properties of Cured Foam

<b>-Nominal Density</b> ASTM D1622	2.0 lbs / ft <sup>3</sup>	<b>-Surface Burning Characteristics</b> ASTM E84 Flame Spread Index	<25 @ 4 inches
<b>-Thermal Resistance</b> ASTM C518 Aged R value	6.9 @ 1 inch 24 @ 3.5 inches 38 @ 5.5 inches	Smoke Development Index	<450 @ 4 inches
<b>-Air Permeance</b> ASTM E2178	0.004 cfm/ft <sup>2</sup> (0.02 L/s/m <sup>2</sup> )	<b>-Compressive Strength</b> ASTM D1621	25 psi nominal
<b>-Water Vapour Transmission</b> ASTM E96-00	0.80 Perms @ 1 inch 0.23 Perms @ 3.5 inches 0.14 Perms @ 5.5 inches	<b>-Tensile Strength</b> ASTM D1623	60 psi nominal
<b>-Closed Cell Content</b> ASTM D2856, %	>90%	<b>-Water Absorption</b> ASTM D2842	<2%
<b>-Dimensional Stability</b> ASTM D2126 (158°F & 97% R.H.)	<10%	<b>-Fungi Resistance</b> ASTM G21	Zero Rating
		<b>-Viscosity</b> Part B @ 75°F	1000 cps +/- 100 cps

### Compliance Standards of Cured Foam

<b>ICC-ES AC377</b>	<b>ICC ESR - 3647</b>	<b>NFPA 285</b>	<b>AC377 Appendix X</b>	<b>NFPA 286</b>
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### Description

**PERMAX 2.0X** is a 2-component polyurethane spray foam system consisting of Components (Parts) A and B, which when sprayed through special plural component spray equipment, will produce a premium seamless, monolithic, and durable closed-cell polyurethane foam air barrier / insulation / vapor retarder suitable for residential and commercial wall applications.

### System Features

- Meets ICC industry standards for Spray Applied Foam Plastic Insulation
- High R-value increases structures' thermal performance and reducing operating energy costs
- Functions as a vapor retarder at a minimum of 1 inch in thickness
- Seasonally adjusted formulas available for ease of spraying at different ambient temperatures

### Usage

**PERMAX 2.0X** is used to insulate a variety of interior wall, subfloor, and roof cavity conditions including: residential & commercial stud walls, attics, cavity-walls, ceilings, crawl spaces, sub-floor cavities, "controlled atmosphere" storage structures and metal buildings. Uncontrolled air leakage is eliminated increasing overall thermal performance of building structure and saving energy costs. Savings vary. Find out why in the seller's fact sheet. Higher R-values mean greater insulation power.

### Product Sizes

- Component A - 500 lbs drums
- Component B - 500 lbs drums

# PERMAX 2.0X 2-Part Polyurethane Foam System

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## Storage and Shelf Life

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Both components should be stored in their original containers and away from excessive heat and moisture, especially after the seals have been broken or some materials have been used. Drums must be stored indoors and jobsite tanks maintained between 50°F and 80°F. Containers should be opened carefully to allow any pressure buildup to be vented safely while wearing full safety protection. Excessive venting of the 'B' component may result in higher density foam and reduced yield. Materials stored at temperatures below 50°F will increase viscosity and some application equipment may not reach adequate spray temperature set points. Supply pumps and hoses must be sized to provide adequate supply when materials are cold and at a higher viscosity. Store drums at 70°F to 80°F for a minimum of 48 hours before use.

**Shelf Life:** Excessive low or high temperatures may decrease shelf life. When stored in the original unopened container at 50°F-80°F, the shelf life of the "Part B" component is six months. Temperature above 80°F decreases the shelf life. The "Part A" component has a shelf life of 6 months in unopened containers when stored at 65°- 80°F.

## Surface Preparation

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All surfaces to receive **PERMAX 2.0X** must be clean and dry, free of dirt, oil, solvent, grease, loose particulates, curing compounds, frost, ice and other foreign matter which could inhibit adhesion. Moisture content and surface conditions of substrate are critical to adhesion of **PERMAX 2.0X** and need to be verified by installing contractor in small test areas before proceeding with full application.

Suitable substrates include: exterior grade gypsum sheathing, OSB, plywood, lumber, CMU, structural & lightweight concrete and properly prepared galvanized, aluminum and painted metal. Lightweight insulating concrete or other friable substrates are not acceptable.

Check surfaces for mill oil used in the manufacturing process on painted steel, galvanized, stainless and aluminum substrates. All oil must be removed and the surfaces clean and dry before priming using **Sherwin Williams® DTM Wash Primer** or **Krylon® Industrial Coatings™ Water-Reducible Wash Primer**.

## Recommended Substrate Temperatures

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**PERMAX 2.0X** is formulated in different reactivity profiles to meet varying substrate temperatures at the jobsite. Supplemental heating is required at temperatures of 40°F and below.

	<u>PERMAX 2.0X</u>	<u>PERMAX 2.0X Fast</u>
Substrate & ambient air application temps	50°F - 120°F	30°F - 80°F

## Processing Characteristics

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### Liquid Component Properties

Viscosity/Specific Gravity at 75°F

Part A 200 cps

Part B 1000 cps ± 10%

Mixing Ratio by Volume ± 2%

50% Part A to 50% Part B or 1:1

### Pressures

1000-1500 psi (depending on hose length)

### Recommended Pre-Heater Processing Temperatures \*\*

Part - A 120°F to 135°F

Part - B 120°F to 135°F

Hose 120°F to 135°F

\*\*Processing temperatures typically used with conventional **Graco®** equipment. Environmental conditions may dictate the use of other temperature ranges; however 135°F must never be exceeded. It is the responsibility of the installing contractor to determine the specific temperature settings to meet environmental, equipment and product limitations. Mechanical purge spray guns (specifically direct impingement or DI type) are recommended for highest foam quality.

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### Climatic Conditions and Humidity

Moisture in the form of rain, dew, frost can seriously affect the quality and adhesion of the **PERMAX 2.0X** to the substrate or itself. Henry Company does not recommend the spraying of this system when the relative humidity (RH) exceeds 85%. When heating the interior of a building the relative humidity can change dramatically and should constantly be measured. Application should not take place when the ambient temperature is within 5°F of the dew point.

Wind velocities in excess of 12 miles per hour may result in excessive loss of exotherm and interfere with the mixing efficiency, affecting foam surface, cure, and physical properties and will cause overspray. Precautions must be taken to prevent damage to adjacent areas from overspray.

### Application

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#### Equipment

The proportioning equipment shall be manufactured specifically for heating, mixing, and spray application of polyurethane foam and be able to maintain 1:1 metering with a  $\pm 2\%$  variance and adequate main heating capacity to deliver heated and pressurized materials up to 135°F. Heated hose must be able to maintain pre-set temperatures for the full length of the hose. Minimum 2:1 ratio feeder pumps are required to supply stored materials through minimum ½-inch supply hoses. Pressurized and heated tanks systems may be used if sized appropriately to provide adequate flow at maximum operating capacity and temperatures.

Balanced chemical output pressures are important to producing good mix. Foam output pressures greater than 200 psi differential indicate either improper chemical temperatures, or worn gun/packing parts. Unequal pressures will cause poor chemical mixing through the module and uneven backpressure. A critical requirement for good spray mixing requires appropriate tip/module sizing to the proportioner and adequate heating capacity. Unequal pressure (>200 psi) can cause excessive pump wear. Do not re-circulate the 'B' component for increased storage temperature as frothing or boil-over may occur at material temperatures above 60°F.

#### Spraying

Thin "flash passes" to very cold surfaces are not recommended. Thin passes (1/4" or less) should be avoided. They may result in reduced yield and loss of adhesion. It is recommended that the total design thickness be completed each day.

This spray system should be applied in uniform minimum pass thickness of 1-inch, maximum pass thickness of 2-inches. Application temperatures below 40°F may require reduction in single pass application thickness. Additional thickness may be applied after 30 min. Yield and in-place-density are dependent upon the temperature of the substrate, ambient air temperature, gun speed application, gun tip size, and the output of the proportioning unit. **PERMAX 2.0X** is designed to provide maximum yield when sprayed in 2" thick passes. Excessive pass thickness can reduce density and physical properties, and cause local overheating and possible fire. When applying over Henry approved Blueskin® membranes, apply initial 1-inch pass and allow to fully cool before subsequent passes – to avoid heat damage to Blueskin® membrane.

#### Vapor Retarder

**PERMAX 2.0X** qualifies as a vapor retarder as defined by the International Code Council and ASHRAE (Class II) at a minimum thickness of one inch. The contractor should consult local building codes to establish the vapor retarder requirement.

### Thermal & Ignition Barriers

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**PERMAX 2.0X** and **PERMAX 2.0X Fast** closed cell insulation may be installed exposed at a maximum thickness of 7 ¼ inches between and over joists in attic floors without a code-prescribed ignition barrier or intumescent coating. The insulation must be separated from the interior of the building by an approved thermal barrier. The ignition barrier in accordance with IBC Section 2603.4.1.6 and IRC Section R316.5.3 may be omitted.

#### Non-Prescriptive Thermal Barrier (choose one)

International Fireproof Technology, Inc. – Paint to Protect® DC315

- Apply Intumescent coating @ 12 mils DFT (1.12 gal per 100 ft<sup>2</sup>)
- Foam not to exceed 7 ¼ inches in walls and in ceilings

Flame Seal® TB

- Apply Intumescent coating @ 18 mils (1.6 gal per 100 ft<sup>2</sup>)
- Foam not to exceed 6 inches in thickness in walls and in ceilings

TPR<sup>2</sup> – Fireshell® BMS-TC

- Apply intumescent coating @ 12 mils DFT (1.24 gal per 100 ft<sup>2</sup>)
- Foam not to exceed 7 ¼ inches in walls and 9 ¼ inches in ceilings

Please refer to and follow the appropriate manufacturer's installation recommendations and guidelines for the products listed above.

## PERMAX 2.0X 2-Part Polyurethane Foam System

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### Freight Classification

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Component A - Resin Compounds Item 46030, Class 55, NOIBN Non-Hazardous  
Component B - Resin Compounds Item 46030, Class 55, NOIBN Non-Hazardous

### Caution

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Read and understand the Material Safety Data Sheet for this product before use. The numerical flame spread and all other data presented is not intended to reflect the hazards presented by this or any other material under actual fire conditions. Polyurethane foam may present a fire hazard if exposed to fire or excessive heat (i.e. cutting torches). The use of polyurethane foam in interior applications on walls or ceiling presents an unreasonable fire risk unless protected by an approved fire resistant thermal barrier with a fire rating of not less than 15 minutes. A UBC or IRC code definition of an approved "thermal barrier" is a material equal in fire resistance to ½" gypsum board. Each firm, person, or corporation engaged in the use, manufacture, or production or application of the polyurethane foams produced from these resins should carefully examine the end use to determine any potential fire hazard associated with such product in a specific use and to utilize appropriate precautionary and safety measures.

Consult with local building code officials and insurance agency personnel before application. Do not re-circulate the 'B' component for increased storage temperature as frothing or boil-over may occur at material temperatures above 60°F. Polyurethane foams will burn when exposed to fire. Caution during application must be observed with signs posted for other trades, "**Caution Combustible Insulation, No Welding or Hot Work Allowed**". On a daily basis remove all debris and shavings from the job site leaving a clean work area.

In freezing conditions [below 32°F], jobsite air temperature must be maintained above 50 degrees F. during the cure cycle so extreme temperature drops to the curing [green] foam are not experienced. **When using fuel fired heating units the exhaust must be vented directly outdoors to prevent unsafe carbon monoxide conditions in the work area.** Electric heating units are preferred. All heaters must be turned off before the application of foam begins. Henry Technical Personnel should be consulted in all cases where application conditions are marginal.

**Worker Exposure Hazards** – Both Components A and B can cause severe inhalation and skin sensitization. For interior applications: full body protection required including air supplying respirator such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode (this includes air supplied hoods). For exterior applications: required either a full face air purifying respirator or half face worn in combination with chemical safety goggles. The recommended APR cartridge is an organic vapor/particulate filter combination cartridge (OV/P100). It is recommended that all applicators and workers obtain recurrent formal training before exposure to or applying this product. More product information and training materials can be found at Henry Company [www.henry.com](http://www.henry.com) – or on SPFA or CPI websites including: [www.spraypolyurethane.com](http://www.spraypolyurethane.com), [www.polyurethane.org](http://www.polyurethane.org), [www.sprayfoam.org](http://www.sprayfoam.org), [www.whysprayfoam.org](http://www.whysprayfoam.org).

**Warning signs should be posted at all entrances stating, "Warning, Breathing Hazard During the Application of Insulation materials. DO NOT ENTER without Proper Breathing Protection."**

### Limited Warranty

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This information herein is to assist customers in determining whether our products are suitable for their applications. Customers should inspect and test our products before use and satisfy themselves as to contents and suitability. Our products are intended for sale to industrial and commercial customers. We warrant that our products will meet our written specifications at the time of sale only. We will replace at no charge any product proved to have a material defect within 12 months of purchase, provided it has been applied in accordance with our written directions for uses we recommended as suitable for this product. Proof of purchase must be provided.

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**STATEMENT OF RESPONSIBILITY**

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