



PERMAX™ 2.0

Polyurethane Spray Foam System
(based upon RT-2045 series resins)

Typical Physical Properties of Cured Foam

-Nominal Density ASTM D1622, lbs/ft ³ -Thermal Resistance ASTM C518 Aged R value per inch (140°F @ 90 days) -Air Permeance ASTM E2178 L/(s·m ²) @ 75Pa ASTM E283 (per AC-377) l/s/m ² ASTM E2357 - Assembly -Water Vapour Transmission ASTM E96 -Water Absorption ASTM C272-01, % -Dimensional Stability ASTM D2126-98, % 168 hr at 70°C, 97% humidity -Pull Adhesion ASTM D4541-09, kPa on DensGlass® on concrete	2.0 lbs 6.459/in @ 1 inch 6.242/in @ 4 inch 0.0005 0.0036 Pass 0.967 perms @ 1 inch 0.474 perms @ 2 inch 1.05 3.06 >36 >48	-VOC Content , calculated -Surface Burning Characteristics ASTM E84 Flame Spread Index Smoke Development Index UBC-26-3 with 15 min thermal barrier 8 inch wall 12 inch ceiling UBC-26-1 BTU/board foot -Compressive Strength ASTM D1621, psi -Tensile Strength ASTM D1623, psi -Shear Strength ASTM C273, psi -Open Cell Content ASTM D2856-94, % -Sound Transmission ASTM E90-04 STC/OITC -Crack Bridging Ability ASTM C1305-06	15g/l max 20 @ 4 inches 450 @ 4 inches Pass Pass 1885 35 55-65 45 7.8 27/26 Pass
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Compliance Standards of Cured Foam

ICC-ES AC377	ICC ESR-3024	ASTM E2357	ASTM C1029	NFPA 285
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Typical Physical Properties of RT-2045 Liquid Resins

Liquid Resins – Component B -Specific Gravity @ 70°F ASTM D1638 -Viscosity, cps	1.22 800± 50	Liquid Resins – Component A -Specific Gravity @ 70°F ASTM D1638 -Viscosity, cps	1.24 200
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Description

PERMAX 2.0 is a 2-component polyurethane spray foam system consisting of Components 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

- Air Barrier Association of America evaluated as an Air Barrier Assembly
- Meets highest industry standards for Spray Applied Foam Plastic Insulation including ASTM E2357
- High R-value increases structures' thermal performance and reducing operating energy costs
- Functions as a vapor retarder in thicknesses greater than 1 inch
- Seasonally adjusted formulas available for ease of spraying at different ambient temperatures
- Compatible with Henry wall assembly components including HE925 BES Sealant, Air-Bloc 32, Blueskin SA, SALT & TWF

Usage

PERMAX 2.0 is used to insulate a variety of interior wall, subfloor, cavity-wall and roof cavity conditions including: residential & commercial stud walls, ceilings, 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.

PERMAX 2.0 2-Part Polyurethane Foam System

Coverage

Average cured foam density 2.0 pounds per cubic foot
4,000 to 4,500 board feet per 1051 lbs 'kit' consisting of 1 drum Part A and 1 drum Part B – based on jobsite conditions

Storage and Shelf Life

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 75°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. **Shelf Life:** Excessive low or high temperatures may decrease shelf life. When stored in the original unopened container at 50°F-75°F, the shelf life of the "Part B" component is six months. Temperature above 75°F decreases the shelf life. The "Part A" component has a shelf life of 6 months in unopened containers when stored at 65°- 85°F.

Surface Preparation

All surfaces to receive **PERMAX 2.0** 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 2.0** 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.

Painted steel, galvanized, stainless and aluminum: check surfaces for mill oil used in the manufacturing process and moisture. 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

PERMAX 2.0 is formulated in three different reactivity profiles to meet varying substrate temperatures at jobsite. Supplemental heating is required at temperatures of 40°F and below. Depending on relative humidity and supplemental heating, application temperatures down to 20°F is possible.

	<u>Winter/Winter Grade</u>	<u>Winter Grade</u>	<u>Regular Grade</u>
Minimum substrate & air temp	30°F	45-60°F	60- 90°F
Maximum substrate & air temp	70°F	80°F	120°F

For applications below 40°F, Henry Company technical personnel should be consulted. At the lower end of the indicated temperature ranges, thin "flash passes" should be avoided.

PROCESSING CHARACTERISTICS

Liquid Component Properties

Viscosity/Specific Gravity at 70°F	
Part A Component (CPS)/(g/cc)	200/1.24
Part B Component (CPS)/(g/cc)	800±50 CPS/1.22
Mixing Ratio by Volume	
Part A Component (CPS)	50
Part B Component (CPS)	50

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Recommended Pre-Heater Processing Temperatures **

Component - A	110-120°F
Component - B	110-120°F
Hose	110-120°F

Processing temperatures typically used with conventional **Gusmer® or **Graco**® equipment. Environmental conditions may dictate the use of other temperature ranges, however 140°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.

<u>Machine Mix at Recommended Temperatures*</u>	<u>Winter/Winter Grade</u>	<u>Winter Grade</u>	<u>Regular Grade</u>
Cream Time	1-2 seconds	1-2 seconds	2-3 seconds
Tack Free Time	3-4 seconds	5-6 seconds	7-8 seconds
Initial Cure Time	4 Hours **	4 Hours **	4 Hours **

* Properties cited were achieved using a **Gusmer H-2000 Proportioner** and **GAP Pro Gun** with #01 module with a static proportioner pressure setting of 1400 psi. Older equipment may be upgraded with “Arctic Booster Pack” heaters or minimum H-2000 heater / proportioner to adequately pre-heat to process temperatures. Spray guns such as; **D-gun**, **GAP Pro Gun**, **Fusion gun**, or **Glascraft™ Probler** guns fitted with smaller output tips (15-18 lbs/min.), are recommended for better spray control in stud wall applications at recommended processing temperatures.

** Complete cure will depend on temperature, humidity and degree of ventilation. Complete cure usually occurs within 24-72 hours

Climatic Conditions and Humidity

Moisture in the form of rain, dew, frost can seriously affect the quality and adhesion of the **PERMAX 2.0** 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

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 130°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.

Guns such as **D-gun**, **Gap Pro**, **Fusion-gun**, **Probler** with tip size approximately 16 lbs/min are suitable for most residential applications. Commercial cold storage, freezer applications, and large metal buildings may utilize higher output guns.

Processing Temperatures

Recommended processing temperatures; ‘Part A’ Main 100-115°F, ‘Part B’ Main 130-135°F, Hose 110-120°F are critical settings to achieve viscosity to allow balanced pressure during spraying. 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 3-inches. Application temperatures below 40°F may require reduction in single pass application thickness. Additional thickness may be applied after a brief waiting period. Yield and in-place-density is dependent upon the temperature of the substrate, ambient air temperature, gun speed application, gun tip size, and the output of the proportioning unit. **PERMAX 2.0** 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 Blueskin membranes, apply initial 1-inch pass and allow to fully cool before subsequent passes – to avoid heat damage to Blueskin membrane.

PERMAX 2.0 2-Part Polyurethane Foam System

Precautions

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 – or on SPFA or CPI websites including: www.spraypolyurethane.com, www.polyurethane.org, www.sprayfoam.org

Product Sizes

Component A – 551 lbs drums, 2500 lbs totes (disposable or returnable)
Component B - 500 lbs drums

Freight Classification

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

Limited Warranty

Contact Warranty Department at warranty@henry.com or location shown below for product or systems warranty information.

STATEMENT OF RESPONSIBILITY

The technical and application information herein is based on the present state of our best scientific and practical knowledge. As the information herein is of a general nature, no assumption can be made as to a product's suitability for a particular use or application and no warranty as to its accuracy, reliability or completeness either expressed or implied is given other than those required by law. The user is responsible for checking the suitability of products for their intended use. Henry Company data sheets are updated on a regular basis; it is the user's responsibility to obtain and to confirm the most recent version. Information contained in this data sheet may change without notice.