

HPS 38374

Product Description

Hernon® Porosity Sealant (HPS) 38374R is the solution to leak proof parts, improving machinability, in addition to increasing the durability and surface quality for painting and plating. The required addition of suitable peroxide activates the dual-cure system enabling the system to cure anaerobically at room temperature or at elevated temperatures. The cured, hardened resin exhibits superior chemical resistance and elevated temperature stability.

The microscopic voids, where potential leaks occur (between metal grains or ceramic or plastic molecules) in the part are filled by low viscosity resin during vacuum application. Sealed micro-pores cure without shrinkage to a tough, cross-linked, thermoset polymer, permanently sealing the work piece. Residual adhesive film is washed from the part surfaces by water during the rinsing cycle.

The parts leave the impregnating process without surface residue and can then be used in production within a short period of time. When used in preparation for plating or painting processes, the impregnation process also eliminates absorption of plating material (like acids) or painting prep solvents that could otherwise bleed out of the pores causing finishes to discolor, blister, pit or peel.

Sealed powdered metal parts exhibit better machinability, enhanced tool life and better dimensional control.

Product Benefits

- Cost effective.
- Provides superior stability and reliability.
- Dual cure system
- High speed processing – impregnation cycles of 25 minutes with 1-to-3-hour room temperature, or 10 minutes at 90°C full cures.
- Reliability – hardened resin exhibits superior chemical and physical elevated temperature resistance and pressure sealability.
- Quick cures coupled with efficient utilization of resin allows for excellent process economics.
- Simplified processing of treated parts – immediate painting or machine of impregnated parts is possible because HPS resin treatment leaves no residue on part surfaces.

Typical Applications

- Pneumatic tool castings
- Automotive carburetors
- Engine blocks
- Water and fuel pumps
- Plastic molds
- Valves, manifolds
- Hydraulic pumps
- Steering gear components
- Compressor parts
- Powdered metal gun parts
- Regulators
- Encapsulated coils

Typical Properties (Uncured)

Property	Value
Chemical Type	Dimethacrylate Blend
Appearance	Clear fluorescent liquid
Specific Gravity	1.03
Viscosity @ 25°C, cP	5-11
Flash Point	See SDS

Typical Environmental Resistance

Chemical/Solvent Resistance

HPS 38374 resists degradation by hydrocarbon solvents, such as gasoline, motor oil, transmission fluid, alcohols, dilute aqueous solutions of acids and bases, water, and fluorinated solvents (like Freon 12). Aged under condition indicated - Tested at 72°F (22°C).

Chemical/Solvent	Absorption (% of original weight)		
	1 Day	1 Week	1 Month
Water	0.75	1.26	2.42
Water Glycol 50/50	0.00	0.15	0.28
Gasoline	0.42	0.76	1.40

General Information

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be selected as a sealant for chlorine or other strong oxidizing materials.

Hernon® Technical Data Sheet

HPS 38374

For safe handling information on this product, consult the Safety Data Sheet (SDS).

Parts Preparation

Cast Parts

Porosity must be free of all cutting oils and dry prior to resin impregnation. Impregnate prior to any plating, anodizing, etc.

Powdered Metal Parts

The best way to impregnate the powdered metal parts is immediately after sintering and before secondary operations. Tumbling and machining tend to smear over porosity making it more difficult for the resin to get into the porosity. Evidence indicates that the machinability of impregnated parts is substantially improved due to the reduction in surface irregularities.

Activation Instructions for Heat cure

HPS 38374 can be activated with Vazo™ initiators and **Hernon® HPS Initiator 91**.

Activate Heat cure using the following mixing proportions:

HPS 38374	HPS Initiator 91
1 Gallon	38 grams
4 Gallon	152 grams
50 Gallons	1950 grams

Mix thoroughly until the initiator is completely dissolved before use.

Anaerobic Cure Mechanism

Peroxide Must be added for anaerobic cure

HPS 38374 is anaerobic, curing in the absence of air where confined, to form a thermo-set polymer. Several factors influence the cure rate of the **HPS 38374** system – chemical, thermal, and ionic activity.

HPS 38374 is accelerated by introduction of **Hernon® Accelerator 28** to the main resin tank. Conversely, addition of more un-accelerated **HPS 38374** bulk to the main tank lowers the overall system activity. An alternate chemical influence is exerted by the addition of **Hernon® Stabilizer 27** to inhibit reactivity. Also, the presence of oxygen, introduced by aerators, inhibits the cure rate.

The higher the system temperature (greater thermal energy) – the quicker the reaction of the impregnation system. Less energy or cooling slows reaction rates.

The activity of metals and other ionic properties of parts in contact with the **HPS 38374** influence cure rate. Highly reactive materials like brass and copper promote faster cure rates. Whereas less active materials like stainless steel are slower.

Temperature Profile

The Thermo-Gravimetric Analysis (TGA, in air) data in the table below confirms **HPS 38374** is suitable for continuous

use to 300°F (149°C), and intermittent exposure to 350°F (177°C).

Temperature		% Weight Loss	
°F	°C	RT Cure	Heat Cure
122	50	0.0	0.0
212	100	0.2	0.2
302	150	1.0	1.0
392	200	1.8	1.8
482	250	12.0	12.0
572	300	22.0	48.7
662	350	52.5	63.9
752	400	70.3	78.4

Elevated temperature curing:

HPS 38374 cures to form a thermoset polymer when exposed to elevated temperatures. Thermal content and coefficient of thermal transfer in the workpieces influence the cure rate of the **HPS 38374** system.

Higher temperatures produce quicker cure rates. **HPS 38374** cures within the range of 177°F (80°C) to 205°F (96°C).

Proper cure requires the workpiece to uniformly attain full cure temperature. Parts that do not transfer heat well will required longer processing times. Efficient thermal conductivity yields shorter processing cycles. Parts with heavier cross sections require longer exposure at heat to attain sufficient temperature internally. Carefully consider part geometry.

Directions for Use

Porosity sealants typically require catalyzation and must be handled with chemically compatible materials and equipment. Use of process equipment designed, built and maintained to **Hernon®** standards is recommended to ensure consistent performance.

1. Typically, a basket of parts is submerged in sealant. Air is expelled out of the porosity under vacuum.
2. A pressure increase causes the sealant to flow into the pore. Ambient pressure is typical but may be augmented.
3. The basket is lifted and spins to reclaim excess sealant.
4. The parts basket is washed in water with agitation as necessary to achieve good cleaning.
5. Parts cure and dry at room temperature.

Consult a **Hernon®** Porosity Sealing Specialist for specific application assistance, process development and equipment selection.

Disposal of Waste

Wastes generated during the impregnation process can, in general, be adequately handled by conventional biological treatment methods. Since both the circumstances of use and local environmental requirements vary, waste disposal recommendations are somewhat application specific.

Storage

Prior to activation, **HPS 38374** should be stored in a cool, dry location in unopened containers at a temperature between 46°F to 82°F (8°C to 28°C) unless otherwise labeled. **Activated resin must be stored under refrigeration at a temperature of 40°F ± 5°F.** Optimal storage is at the lower half of these temperature ranges. To prevent contamination of unused material, do not return any material to its original container.

These suggestions and data are based on information we believe to be reliable and accurate, but no guarantee of their accuracy is made. HERNON MANUFACTURING®, INC. shall not be liable for any damage, loss or injury, direct or consequential arising out of the use or the inability to use the product. In every case, we urge and recommend that purchasers, before using any product in full scale production, make their own tests to determine whether the product is of satisfactory quality and suitability for their operations, and the user assumes all risk and liability whatsoever, in connection therewith. Hernon's Quality Management System for the design and manufacture of high-performance adhesives and sealants is registered to the ISO 9001 Quality Standard.