

Technical Data Sheet HPS 1000

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Product Description

Hernon[®] Porosity Sealant (HPS) 1000 is the solution to leak proof parts, improving machinability, in addition to increasing the durability and surface quality for painting and plating. The hardened resins exhibit superior chemical resistance and elevated temperature stability. This resin has excellent wash-ability in the rinse cycle.

The microscopic voids, where potential leaks occur (between metal grains or ceramic or plastic molecules) in the part are filled by the low viscosity resin during vacuum application. Filled micropores cure without shrinkage when exposed to elevated temperature to form a tough cross-linked thermoset polymer, permanently sealing the workpiece. Residual adhesive film is water-washed from the part surfaces during rinsing.

The impregnation process leaves parts without any surface residue and they can be used in production immediately. When used in preparation for plating or painting processes, the impregnation process also eliminates absorption of plating materials (like acids) or painting prep solvents that could otherwise later 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

- Single component
- Excellent wash-ability
- The most cost effective method of resin impregnation sealing on the market.
- Provides superior stability and reliability. High speed processing, parts are ready in 30 minutes from floor to floor.
- Reliability – hardened resin exhibits superior chemical and physical, elevated temperature resistance and pressure sealability.
- A simplified process permitting processing of treated parts: immediate painting or machine of impregnated parts is possible because **HPS 1000** resin leaves no residue

Typical Applications

- Pneumatic tool castings
- Automotive carburetors
- Engine blocks
- Water and fuel pumps
- Plastic molds
- Valves, manifolds
- Railway, truck brake parts
- Hydraulic pumps
- Steering gear components
- Compressor parts

Typical Properties (Uncured)

| Property | Value |
|----------------------|--------------------------|
| Resin | Dimethacrylate blend |
| Appearance | Clear fluorescent liquid |
| Viscosity @ 25°C, cP | 6 |
| Specific gravity | 1.06 |
| Flash point | See MSDS |

Cure Mechanism And Rate

HPS 1000 cures to form a thermoset polymer when exposed to elevated temperature. Thermal content and coefficient of thermal transfer in the workpieces influence the cure rate of the **HPS 1000** system.

Higher temperatures produce quicker cure rates. **HPS 1000** 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 require 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.

Typical Properties (Cured)

| Property | Value |
|--------------------------------|-------------------------|
| Hardness, Shore D | 75 |
| Operating Temperature, °C (°F) | -55 to 150 (-65 to 300) |

Typical Environmental Resistance

Chemical/Solvent Resistance

HPS 1000 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).

| Chemical/Solvent | % Absorption After Immersion | | |
|--------------------|------------------------------|--------|---------|
| | 1 Day | 1 Week | 1 Month |
| Water | 0.76 | 1.28 | 2.46 |
| Gasoline | 0.01 | 0.16 | 0.29 |
| 50/50 Glycol/Water | 0.43 | 0.77 | 1.42 |

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.

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

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 any secondary operation. 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.

Directions for use

Impregnation system reactivity is monitored by measurement of the Gel Time of a small controlled sample of resin taken from the system. The following operational parameters are presented as a "typical" scenario to assess cure rate of the impregnation process and system:

1. Keep Resin at temperatures between 50°F-60°F in Tank #1.
2. Gel Time @ 194°F (90°C) should be in the range of 5-10 minutes.

HPS 1000 has been formulated to produce Gel Times in the 5-10 minute range @ 194°F (90°C). Should the Gel Time be below 5 minutes or above 10 minutes contact **Hernon® Customer Service**.

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.

Generally Impregnation resin contains surfactant to improve the resin's washability. However, the disposal of surfactant in the sewer system kills the digestive enzymes present in the sewer system creating havoc on the flow. **HPS 1000 offers superior washability and does not contain surfactant.**

Storage

For safe storage, store **HPS 1000** at or below 10°C (50°F). Keep in a cool, well ventilated area away from heat, sparks and open flame. Keep container tightly closed until ready for use. To prevent contamination of unused material, do not return any material to its original container.

HPS 1000 in an active impregnation system with normal use has unlimited pot life if recommended controls are maintained, including temperature controls. Do not allow continuous exposure to ultraviolet light. **HPS 1000** does not require aeration.

Impregnation Equipment

Hernon® offers complete systems support for vacuum impregnation. A full selection of equipment and tank sizes is available. Each system is engineered to maximize quality control of the process to maximize productivity, economy of sealant usage, and energy efficiency. Contact **Hernon® Sales** for additional information.

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.