Technical Data Sheet

LOCTITE® IS 90R™

Known as LOCTITE® Resinol® 90R™ and LOCTITE® IMP 90R
May 2017

PRODUCT DESCRIPTION

LOCTITE® IS 90R™ provides the following product characteristics:

Technology	Acrylic
Chemical Type	Methacrylic Acid Ester
Appearance (uncured)	Clear liquid[LMS]
Fluorescence	Positive under UV light[LMS]
Emulsification	Yes, in water
Components	One component - requires no mixing
Viscosity	Low
Cure	Heat cure
Application	Sealing

LOCTITE® IS 90R™ is a low viscosity liquid sealant designed for sealing porosity in metal castings and powder metal parts. It may also be used to seal microscopic voids and tight interfaces in other materials. This sealant is specifically formulated for wash water removal and reuse. This is accomplished with the aid of a Henkel Loctite Resinol 90R Recycling System. LOCTITE® IS 90R™ sealant is typically applied with a vacuum impregnation process that removes air from the internal void and then saturates the part with liquid sealant. At elevated temperature, the liquid rapidly polymerizes to form a tough thermoset polymer that permanently seals the internal cavities. Liquid sealant is easily washed off with plain water and parts treated with this product are unchanged cosmetically or dimensionally. LOCTITE® IS 90R™ is used to seal castings and powder metal parts against leakage of coolants, lubricants, fuels, hydraulic fluids, steering systems, air and other fluids in automotive powertrains, air conditioning and other components.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	0.94
Viscosity, Cone & Plate, 25 °C, mPa·s (cP):	
Cone C60/1°Ti @ shear rate 1,000 s^{-1}	4 to 11[LMS]
Surface Tension, ASTM D 1590, dynes/cm	30.6
Flash Point - See SDS	

TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

Shore Hardness, ISO 868, Durometer D		48
Glass Transition Temperature ISO 11359-2, °C		20
Coefficient of Thermal Expansion, ISO 11359-2 K^{-1}:		
alpha 1		95×10^{-06}
alpha 2		155×10^{-06}
Design Limit, Continuous Temperature, °C		200
Design Limit, Temperature Exposure less than 24 hours, °C		250
Compressive Modulus, ISO 604	N/mm² (psi)	12.3 (1,780)
Compressive Strength, at failure, ISO 604	N/mm² (psi)	3.6 (525)
Flexural modulus , ASTM D790	N/mm² (psi)	32 (4,650)

TYPICAL ENVIRONMENTAL RESISTANCE

Data shown herein should not be used in place of actual part testing. Sealing performance depends as much upon the surrounding substrate as it does upon the sealant. The parent material provides substantial protection against oxygen and pressure loads. Smaller pores, longer leak paths and lower differential pressures yield better durability. The testing described herein provides standard comparisons of LOCTITE® sealants on a consistent interface. *Predicting the performance of real world applications using extrapolations from this data is not recommended.* The performance of any sealant should be experimentally validated against the specific demands of a particular application, preferably using actual production methods.

Durability Performance

Standard test pieces were sealed with LOCTITE® IS 90R™ and subjected to accelerated life testing under adverse conditions. The test specimen was 3.2 mm thick FC0208 sintered powder metal of 6.8 g/mL density (12% porous substrate). Samples were tested at 4 atmospheres internal pressure. Leak rates were measured using volume/time at pressure under water. Initial leak rates were over 10,000 mL/minute.

		% of initial leak			
Environment	**°C**	**500 h**	**1000 h**	**2000 h**	**4100 h**
21% Oxygenated Air (control)	23	0	0	0	0
Unleaded gasoline	23	0	0	0	0
Motor oil (10W-30)	121	0	0	0	0
ATF (Dexron III)	121	0	0	0	0
Water/glycol 50/50	121	0	0	0	0
Brake Fluid (Dot 3)	121	0	0	0	0
21% Oxygenated Air	121	*0.0	*0.0	*0.0	*0.0

* 0.0% signifies a leak that is too small to quantify (<0.03%)

High Temperature Resistance

At temperatures above 160 °C, organic polymers may react with available oxygen. In porosity, the surrounding substrate typically protects the sealant from air. Oxidation may cause the sealant to discolor without compromising the seal. Exterior surfaces are affected first; therefore, cross-sections that are thicker than 3.2 mm enjoy proportionately higher resistance. Applications that include working fluids other than oxygenated air resist elevated temperatures better.

Conditioning	**Environment**	
4100 hours salt fog	40 °C, Condensing	0
1000 Thermal Cycles	-40 °C to + 121 °C, 2 hour period	*0.0
Acid Exposure	24 hours in pH 1 sulfuric acid	0
Caustic Exposure	24 hours in pH 13 sodium hydroxide	0
Hot Strength	100 psi air, part @ 176 °C	0

*0.0 signifies a leak that is too small to quantify (<0.03%)

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 Safety Data Sheet (SDS).

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 LOCTITE® standards is recommended to ensure consistent performance. Consult a LOCTITE® Porosity Sealing Specialist for specific application assistance, process development and equipment selection.

1. Use any of the following vacuum impregnation methods to impregnate parts in LOCTITE® IS 90R™: Dry vacuum/pressure, wet vacuum/pressure, wet vacuum, pressure impregnation.
2. Centrifuge or drip drain the parts to reclaim excess sealant from the parts.
3. Wash parts in water and wash water conditioner (chemistry need for recycling of the LOCTITE® IS 90R™) with agitation to achieve good cleaning.
4. Rinse parts in water with agitation to finish the cleaning process.
5. Soak parts in hot water at 90°C to cure the resin. NOTE: Corrosion inhibitors may be added to final rinse if required .

Heat Activated Resin Cure Mechanism

Liquid LOCTITE® IS 90R™ cures when the resin is heated to at least 90°C.

Cure rate depends on the part temperature and the size of the parts being sealed. In general, parts can be sealed once the temperature has returned back to ambient conditions, typically 5-20 minutes.

Waste Disposal

Although the amount of waste rinse water generated with this technology is minimal, any waste rinse water generated during this porosity sealing 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. Contact Loctite® Impregnation Technical Service for the details of an effective waste disposal program.

Loctite Material Specification[LMS]

LMS dated February 23, 2011. Test reports for each batch are available for the indicated properties. LMS test reports include selected QC test parameters considered appropriate to specifications for customer use. Additionally, comprehensive controls are in place to assure product quality and consistency. Special customer specification requirements may be coordinated through Henkel Quality.

Storage

Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.

Optimal Storage: 8 °C to 21 °C. Storage below 8 °C or greater than 28 °C can adversely affect product properties. Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel Corporation cannot assume responsibility for product which has been contaminated or stored under conditions other than those previously indicated. If additional information is required, please contact your local Technical Service Center or Customer Service Representative.

Conversions

(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = inches
µm / 25.4 = mil
N x 0.225 = lb
N/mm x 5.71 = lb/in
N/mm² x 145 = psi
MPa x 145 = psi
N·m x 8.851 = lb·in
N·m x 0.738 = lb·ft
N·mm x 0.142 = oz·in
mPa·s = cP

Reference 0.3

Note:
The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.
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