Technical Data Sheet

LOCTITE® PC 7227™

Known as LOCTITE® 7227™ or LOCTITE® Brushable Ceramic Grey
May 2020

PRODUCT DESCRIPTION

LOCTITE® PC 7227™ provides the following product characteristics:

Technology	Epoxy
Chemical Type	Epoxy
Appearance (Resin)	Grey
Appearance (Hardener)	Amber
Components	Two part - Resin & Hardener
Mix Ratio, by weight - Part A: Part B	4.8 : 1
Mix Ratio, by volume - Part A: Part B	2.75 : 1
Cure	Room temperature cure after mixing
Application	Coating
Application Temperature	20 to 30°C (68 to 86°F)
Service Temperature (Dry)	100°C (212°F)
Service Temperature (Wet)	90°C (194°F)
Specific Benefits	• Ceramic and silicon carbide filled - to provide maximum protection. • Ultra-smooth brushable consistency. • Easy to mix and use. • Reduces downtime. • Superior adhesion - forms a solid bond.

LOCTITE® PC 7227™ is an ultra-smooth, ceramic reinforced brushable epoxy coating that is solvent-free with lower viscosity for a thinner coating. It is designed to protect surfaces against turbulence, chemicals, abrasive and corrosive agents. Its high gloss, low friction surface can be used to restore or increase pump efficiency and also works as a top coat over Loctite Wearing Compounds for application requiring rebuilding and longer lasting protection. Typical applications are rebuilding or resurfacing pump impellers, housings, pipe walls and elbows, valve bodies, repairing and protecting heat exchangers, condensers, lining tanks, chutes, resurfacing and repairing rudders and pintel housings.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Resin:

Density @ 25 °C, ISO 1675	g/cm³	1.7 to 1.8
	(lbs/gal)	(14.35 to 14.85[LMS])
Viscosity @ 25 °C, mPas (cP) Brookfield - RV, Spindle 7, speed 10 rpm		200,000 to 260,000[LMS]

Hardener:

Density @ 25 °C, ISO 1675	g/cm³	1 to 1.1
	(lbs/gal)	(8.6 to 8.9[LMS])
Viscosity @ 25 °C, mPas (cP) Brookfield - RV, Spindle 2, speed 20 rpm		500 to 900[LMS]

Mixed:

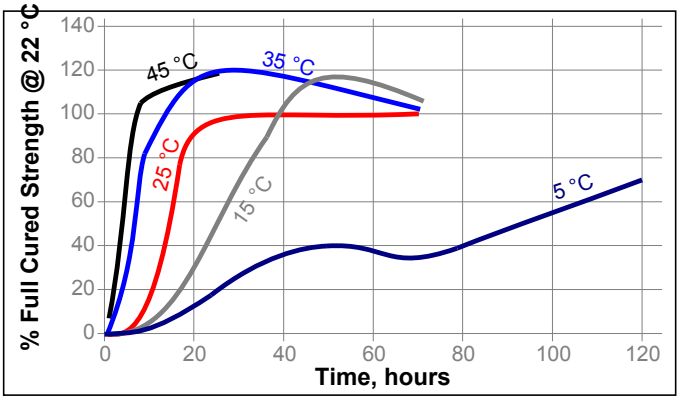
Density @ 25°C, ISO 1675	g/cm³	1.4
	(lbs/gal)	(11.7)
Viscosity @ 25°C, mPa·s (cP) Viscosity, Cone & Plate, Shear Rate 10s-1		20,000
Vertical Sag Resistance, 25°C , µm ISO 16862		92

TYPICAL CURING PERFORMANCE

Gel Time, ASTM D2471, minutes	34 to 48
Recoat Time @ 25 °C, hours	1 to 3

Cure Speed vs. Temperature

The graph below shows the shear strength developed with time on grit blasted mild steel and aluminum lap shears and tested according to ISO 4587.



TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 7 days @ 22 °C

Physical Properties:

Tensile Strength , ISO 527-2	N/mm² (psi)	27.3 (3,960)
Tensile Modulus , ISO 527-2	N/mm² (psi)	5,813 (843,000)
Glass Transition Temperature (Tg) TMA, ISO 11359-2	°C	51
Heat Deflection Temperature, ASTM D648	°C	57.8
Coefficient of Thermal Expansion, K^{-1} ISO 11359-2,:		
Below Tg		50×10^{-06}
Above Tg		135×10^{-06}
Shore Hardness, ISO 868 , Durometer D		85
Elongation , ASTM D638	%	2
Volume Shrinkage, ISO 1675	%	19.6

Abrasion Properties:

Miller Wear Resistance, Volume Lost, (ASTM G75, alumina F220, 6 hour test)	mm³	1,430
Taber Test, Volume lost, (ASTM D4060, Wheel CS-17, 1kg, 1000 cycles)	mm³	63

Electrical Properties:

Dielectric strength, ASTM D149	kV/mm	7.57
Surface Resistivity, IEC 60093	ohms	0.6×10^{15}
Volume Resistivity, IEC 60093	ohms-cm	2.0×10^{14}

Adhesive Properties:

Tensile Lap Shear Strength, ISO 4587:

Aluminum	N/mm² (psi)	8.4 (1,220)
Mild steel (grit blasted)	N/mm² (psi)	22.2 (3,220)
Stainless steel	N/mm² (psi)	16.8 (2,440)

TYPICAL ENVIRONMENTAL RESISTANCE

Dry Service Temperature Resistance, CSA-Z245.20-06/CSA-Z245.21-06 Rating 2	°C	110

After storage in hot air for 28 days at 110°C the coating applied on a metal panel:
Rating 2: less than 50% can be removed

Tables below show chemical resistance @ 25°C, immersed up to 5000hrs. Please refer to the chemical resistance chart for more detailed description.

Acids

40 % Sulphuric Acid	Continuous long term immersion

Alkalis

25 % Ammonium Hydroxide	Continuous long term immersion

Solvents

100 % Deionized Water	Continuous long term immersion
10 % salt water	Continuous long term immersion
100 % Methanol	Short term or intermittent immersion
100 % Acetone	Spill, splash with immediate cleanup

Hydrocarbons

100 % Kerosene	Continuous long term immersion
100 % Petrol Unleaded	Continuous long term immersion

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:

Surface Preparation

Proper surface preparation is critical to the long-term performance of this product. The exact requirements vary with the severity of the application, expected service life, and initial substrate conditions.

- Remove dirt, oil, grease etc with a suitable cleaner, e.g. high pressure water cleaning system using Loctite® 7840™ or Loctite® Natural Blue® cleaner/degreaser.
- All skip welds, weld spatter, buckshot, and other surface roughness must be ground down; undercuts and pinholes must be ground and filled. All projections, sharp edges, high points and fillets must be ground to a radius of at least 3mm and all corners must be likewise rounded to maximize product performance.
- Blast all surfaces to be coated with a sharp edged angular grit to a depth of profile of 75 to 100 microns (3 to 4 mils), and a degree of cleanliness of Near White Metal (SIS SA 2½ /SSPC-SP 10). For immersion service, a degree of cleanliness of White Metal (SIS SA 3/SSPC-SP 5) is required.
- After blasting, the metal surface should be cleaned with a residue-free cleaner or solvent to remove dust and contaminants. Clean, dry compressed air may also be used to remove dust and contaminants. The surface should be coated before any new oxidation occurs.
- Metal that has been in contact with salt solutions, e.g. seawater, should be grit blasted and high-pressure water blasted, left for 24 hours to allow any salts in the metal to sweat to the surface. A test for chloride contamination should be performed. The procedure should be repeated until chloride concentration on the surface is below 40 ppm.

Application of LOCTITE® PC 7227™:

- Measure 4.8 parts of resin and 1 part of hardener by weight or mix entire kit thoroughly until color is consistent .
- Film thickness per coat: 250 to 500 microns (10 to 20 mils). Minimum of 2 coats is recommended to avoid any pin holes. Layering of two different colors may be used as a wear indicator for re-application.
- Multiple coat application may be carried out, If final thickness cannot be achieved with one application. If this time has elapsed, light abrasive blasting is required, followed by a solvent wash to remove any abrasive residues.
- Apply material to prepared surface by first forcing a thin layer deep into the texture of the substrate.

- Then immediately build up to the desired finished thickness.

Technical Tips for Working with Epoxies
Environmental Conditions:

- Relative humidity: <85%.
- Ambient temperature: >15°C (60°F) and rising.
- Substrate temperature must always be 3°C (7°F) higher than the dew point to avoid condensing moisture on parts .
- Working time and cure depends on temperature and mass.
- The higher the temperature, the faster the cure.
- The larger the mass of material, the faster the cure.
- To speed the cure of epoxies at low temperatures.
- Store epoxy at room temperature or warm resin/hardener component(s) prior to mixing. Never use open flame.
- Pre-heat repair surface until warm to the touch.
- Tent working area to achieve suitable environmental conditions.
- To slow the cure of epoxies at high temperatures.
- Store epoxy at room temperature or cool resin/hardener component(s) prior to mixing.
- Work during cool, morning hours and shade area from direct sun.

Inspection

- Visually inspect for pinholes and misses just after application.
- Once the coating has cured, repeat visual inspection to confirm absence of pinholes, voids or damaged areas..
- Control thickness of the coating, especially in the critical areas.
- Perform a test with a holiday detector to confirm coating continuity.

Color

- Color variation is possible between the batches and will not affect the performance of the product.

Coverage

To achieve a 0.8 millimeter (15.7 mils) thickness, the coverage rate will be 0.8 m² (8.6 ft²) for 1 kg (2.2 lb), excluding overthickness, repairs, etc.

Repairs

Any voids, pinholes, or low thickness areas found in the coating should be repaired by lightly abrading, cleaning, and applying further product.

Clean-up

Immediately after use clean tools with suitable cleaner, e.g. Loctite® SF 7063™ or a solvent such as acetone or isopropyl alcohol. Once cured, the material can only be removed mechanically

Loctite Material Specification[LMS]

LMS dated May 22, 2001 (Resin) and LMS dated May 22, 2001 (Hardener). 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 Loctite 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

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Reference 2.5