Loctite® Nordbak® High Temperature Brushable Ceramic

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PRODUCT DESCRIPTION

LOCTITE® Nordbak® High Temperature Brushable Ceramic provides the following product characteristics:

Technology	Epoxy
Chemical Type	Epoxy
Appearance(Resin)	Red[LMS]
Appearance(Hardener)	Amber[LMS]
Appearance(Mixed)	Red[LMS]
Components	Two component-requires mixing
Mix Ratio,by volume Resin:Hardener	2.6:1
Mix Ratio, by weight Resin: Hardener	4.25:1
Cure	Heat cure
Application	Coating
Specific Benefit	• Ceramic reinforced • Easy to mix and use • High temperature resistance • High gloss finish • Superior adhesion

LOCTITE® Nordbak® High Temperature Brushable Ceramic is an impervious ceramic composite that offers an ultra smooth glossy surface. This technology significantly improves and reduces the surface friction that causes “boundary drag". The improved surface smoothness assists where applications require maximum fluid flow efficiency whilst protecting against abrasion, turbulence, corrosion/erosion under typical dry service temperatures of -29 °C to +287 °C. Used by itself, LOCTITE® Nordbak® High Temperature Brushable Ceramic is recommended for sealing and protecting equipment from corrosion and wear. It also works as a top coat over Loctite® Nordbak® Wearing Compounds for applications requiring surface rebuilding and lasting protection. Typical applications include providing a smooth, protective abrasion resistant coating, repairing heat exchangers and condensers, lining tanks and chutes, resurfacing and repairing rudders and pintel housings, and repairing cooling pump impellers, butterfly valves and cavitated pumps

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TYPICAL PROPERTIES OF UNCURED MATERIAL

Resin:

Viscosity, Brookfield - RV, 25 °C, mPa·s (cP):	
Spindle 7, speed20 rpm	140,000 to 200,000[LMS]
Weight Per Gallon, lbs/gal	13.2 to 13.75[LMS]

Hardener:

Viscosity, Brookfield - RV, 25 °C, mPa·s (cP):	
Spindle 3, speed 20 rpm	1200 to 3,000[LMS]
Weight Per Gallon, lbs/gal	8.15 to 8.4[LMS]

Mixed:

Viscosity, Cone & Plate, 25 °C, mPa·s (cP):	
Shear rate 10 s^{-1}	69,100
Coverage	1.1 m² @ 0.5 mm thick/0.9kg (12 ft² @ 20 mils thick/2 lb)

TYPICAL CURING PERFORMANCE

Curing Properties

Gel Time @ 25 °C, hours	
400 g mass	5 to 6[LMS]
Recoat Time @ 25 °C, hours	1 to 6

Curing speed vs. Temperature

The graph below shows the lap shear strength developed with time at different temperatures on grit blasted steel and tested according to ISO4587.

Strength/%	1h	2h	4h	8h	24h
5℃	0	0	0	0	0.6
15℃	0	0	0	0	20
25℃	0	0	0	0	18
35℃	0	0.8	58	66	109
45℃	2	118	127	120	114

TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 8 hours @ 25 °C and 3h@149°C

Physical Properties:

Hardness ShoreD, ASTM D2240	88
Volume Shrinkage, ASTM D 792,%	7.5
Tg, DMA Temperature ramp from -40°C to 200°C at 10°C/min. °C	56
Coefficient of Thermal Expansion, ASTM C531, K_{-1}:	
Pre Tg	40
Post Tg	108
Flexural strength , ASTM D790	N/mm² 87 (psi) (12,570)
Flexural Modulus , ASTM D790	N/mm² 9,298 (psi) (1,348,150)
Compressive Strength , ASTM D695	N/mm² 108 (psi) (15,640)
Compressive Modulus, ASTM D695	N/mm² 3,029 (psi) (439,240)
Tensile Strength, ASTM D638	N/mm² 37 (psi) (5,360)
Tensile Modulus, ASTM D638	N/mm² 5,338 (psi) (773,980)
Elongation, at break, ASTM D638,%	0.8
Shear Strength, ISO4587 grit blasted steel	N/mm² 15 (psi) (2,210)
Abrasion Resistance, ASTM D4060 1Kg load, CS-10 wheels	
Weight of material lost,	mg 11
Volume of material lost,	mm³ 8
Thermal Conductivity,ASTM F-433,Watts/mK	0.47
Heat Deflection Temperature, ASTM D648, ℃	169
Water Vapor Trans. Rate, ASTM E96，g/(Pa*s*m2)	$5.1x10^{-11}$
Temperature Range ℃	
Dry	287
Wet	90

Electrical Properties:

Volume Resistivity, ASTM D257,	Ω·cm 5.7×10^{13}
Surface Resistivity, ASTM D257,	Ω 1.1×10^{15}

TYPICAL ENVIRONMENT RESISTANCE

Cured @ 25℃ for 72h and tested on grit blasted steel according to ISO4587

Hot Strength

Tested at temperature indicated.

Temperature/℃	10	37	66	93	121	149	177
Strength/%	89	98	103	86	102	110	82

Heat Aging

Aged at temperature indicated and tested @ 25 °C.

Strength/%	250h	500h	750h	1000h
66℃	130	138	130	124
93℃	137	127	134	82
120℃	118	138	136	119
150℃	110	107	94	110
170℃	88	77	76	83

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).

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.

1. Clean, dry and abrade application surface. The more thorough the degree of surface preparation the better the performance of the application. If possible, it is recommended that the surface be grit blasted to a Near White Metal (SSPC-SP10/NACE No. 2) Standard. For less severe applications roughening the surface with hand tools is suitable.
2. Solvent cleaning with a residue-free solvent is recommended as the final step to aid in adhesion.

Mixing:

1. Material temperature should be between 20 °C to 30 °C.
2. Add hardener contents to resin. Mix material vigorously until uniform in color. Be sure to mix along the bottom and sides of mixing container. Mix three to five minutes.

Application Method:

1. Apply fully mixed material to the prepared surface.
2. Cure time is 8 hours followed by a 3 hour post-cure @ 149 °C.

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. Material removed from containers may be contaminated during use. Do not return liquid to original container. 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**. Henkel cannot assume responsibility for product which has been contaminated or stored under conditions other than those recommended. 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

Note

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Reference 1.1