



Loctite® Nordbak® Brushable Ceramic Gray

March 2008

PRODUCT DESCRIPTION

LOCTITE® Nordbak® Brushable Ceramic Gray provides the following product characteristics:

Technology	Epoxy
Chemical Type	Epoxy
Appearance(Resin)	Gray ^{LMS}
Appearance(Hardener)	Amber ^{LMS}
Appearance(Mixed)	Gray ^{LMS}
Components	Two component-requires mixing
Mix Ratio,by volume Resin:Hardener	2.75:1
Mix Ratio, by weight Resin: Hardener	4.8:1
Cure	Room temperature cure
Application	Coating
Specific Benefit	<ul style="list-style-type: none"> • 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® Nordbak® Brushable Ceramic Gray 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 +125 °C. Used by itself, LOCTITE® Nordbak® Brushable Ceramic Gray 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.

NSF International

Certified to ANSI/NSF Standard 61 for use in commercial and residential potable water systems not exceeding 82° C.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Resin:

Viscosity, Brookfield - RV, 25 °C, mPa·s (cP):
Spindle 7, speed 10 rpm 200,000 to 260,000^{LMS}
Weight Per Gallon, lbs/gal 14.35 to 14.85^{LMS}

Hardener:

Viscosity, Brookfield - RV, 25 °C, mPa·s (cP):
Spindle 2, speed 20 rpm 500 to 900^{LMS}
Weight Per Gallon, lbs/gal 8.6 to 8.9^{LMS}

Mixed:

Viscosity, Cone & Plate, 25 °C, mPa·s (cP):
Shear rate 10 s⁻¹ 20,960

Coverage 1.1 m² @ 0.5 mm thick/0.9 kg
(12 ft² @ 20 mils thick/2 lb)

TYPICAL CURING PERFORMANCE

Curing Properties

Gel Time @ 25 °C, minutes 34 to 48^{LMS}
400 g mass 1 to 3
Recoat Time @ 25 °C, hours 1 to 3

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°C	0	0	0	0	7
15°C	0	0.1	0.4	8	65
25°C	0	0	2	16	83
35°C	3	36	71	82	100
45°C	24	59	81	98	93

TYPICAL PROPERTIES OF CURED MATERIAL

Cured @ 25°C for 24h

Physical Properties:

Hardness ShoreD, ASTM D2240 85
Volume Shrinkage, ASTM D 792, % 1.8
Tg, DMA Temperature ramp from -40°C to 200°C at 10°C/min. °C 59
Coefficient of Thermal Expansion, ASTM C531, K⁻¹
Pre Tg 47
Post Tg 136
Flexural strength, ASTM D790 N/mm² 62 (psi) (9,050)
Flexural Modulus, ASTM D790 N/mm² 5,305 (psi) (769,200)
Compressive Strength, ASTM D695 N/mm² 70 (psi) (10,180)
Compressive Modulus, ASTM D695 N/mm² 3,855 (psi) (558,900)
Tensile Strength, ASTM D638 N/mm² 30 (psi) (4,370)
Tensile Modulus, ASTM D638 N/mm² 6,903 (psi) (1,000,930)
Elongation, at break, ASTM D638, % 0.7
Shear Strength, ISO4587 N/mm² 21 (psi) (3,020)
grit blasted steel
Lap Shear Strength, ISO 4587:
Abrasion Resistance, ASTM D4060
1Kg load, CS-10 wheels
Weight of material lost, mg 12
Volume of material lost, mm³ 7
Thermal Conductivity,ASTM F-433, Watts/mK 0.53
Heat Deflection Temperature, ASTM D648 °C 46
Water Vapor Trans. Rate, ASTM E96 g/(Pa*s*m²) 8.5x10⁻¹¹
Temperature Range °C
Dry 125
Wet 65
Electrical Properties:
Volume Resistivity, ASTM D257, Ω·cm 3.7x10¹³
Surface Resistivity, ASTM D257, Ω 5.8x10¹⁴



TYPICAL ENVIRONMENT RESISTANCE

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

Hot Strength

Tested at temperature indicated.

Temperature/°C	10	37	66	93	121	149	177
Strength/%	86	91	24	10	9	7	10

Heat Aging

Aged at temperature indicated and tested @ 25 °C

Strength/%	250h	500h	750h	1000h
66°C	87	83	103	101
93°C	101	102	111	104
120°C	121	111	105	61
150°C	85	67	62	82
177°C	67	67	68	67

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.

- 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.
- Solvent cleaning with a residue-free solvent is recommended as the final step to aid in adhesion.

Mixing:

- Material temperature should be between 20 °C to 30 °C.
- 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:

- Apply fully mixed material to the prepared surface.

Caution: Use an approved, positive-pressure, supplied air respirator when welding or torch cutting near cured compound. **Do Not** use open flame on compound.

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

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$
 $\text{kV/mm} \times 25.4 = \text{V/mil}$
 $\text{mm} / 25.4 = \text{inches}$
 $\mu\text{m} / 25.4 = \text{mil}$
 $\text{N} \times 0.225 = \text{lb}$
 $\text{N/mm} \times 5.71 = \text{lb/in}$
 $\text{N/mm}^2 \times 145 = \text{psi}$
 $\text{MPa} \times 145 = \text{psi}$
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$
 $\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$
 $\text{mPa}\cdot\text{s} = \text{cP}$

Note

The developmental product for which the data provided herein are furnished for informational purposes only and are believed to be accurate and reliable. Nevertheless, Henkel Corporation cannot and will not assume responsibility for the results obtained by others over whose production methods we have no control. Thus, it is the user's responsibility to determine the suitability of this developmental product for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling, storage, disposal and use thereof. In light of the foregoing, **HENKEL CORPORATION SPECIFICALLY DISCLAIMS ANY AND ALL WARRANTIES EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND FREE FROM CLAIMS OF THIRD PARTY PATENT INFRINGEMENT, ARISING FROM THE SALE, POSSESSION, HANDLING, STORAGE, DISPOSAL, TRANSPORTATION OR USE OF THIS DEVELOPMENTAL PRODUCT . HENKEL CORPORATION SPECIFICALLY DISCLAIMS ANY LIABILITY FOR CONSEQUENTIAL OR**

INCIDENTAL DAMAGES OF ANY KIND, INCLUDING LOST PROFITS. Neither the developmental product, nor the data or discussion herein of various processes for which, are to be interpreted as an express or implied license under any Henkel Corporation patents. Henkel Corporation recommends that any and all proposed commercial application(s) using this developmental product be evaluated for reproducibility in the exact manner and on the production equipment with which it is intended to be used before repetitive commercial production use, using this data as a guide. This developmental product may be covered by one or more United States or foreign patents or patent applications of Henkel Corporation, or under which Henkel Corporation is licensed.

Trademark usage

Except as otherwise noted, all trademarks in this document are trademarks of Henkel Corporation in the U.S. and elsewhere. ® denotes a trademark registered in the U.S. Patent and Trademark Office.

Reference 1.1