

## LOCTITE® EA 3471

August 2022

### Product description

LOCTITE® EA 3471 provides the following product characteristics:

<b>Technology</b>	Epoxy
Chemical type	Epoxy
Appearance (resin)	Grey
Appearance (hardener)	White
Appearance (mixed)	Grey putty
Mix Ratio, (by weight) resin : hardener	6.25 : 1
Mix Ratio, (by volume) resin : hardener	2.5 : 1
<b>Cure</b>	Room temperature cure after mixing
<b>Application</b>	Metal repair
Application temperature	15°C to 30°C (59°F to 86°F)
Specific benefits	<ul style="list-style-type: none"> <li>• Will not sag or shrink</li> <li>• Rebuilds worn parts fast - limits downtime</li> <li>• High steel content - cures to a metal-like finish</li> <li>• Superior adhesion - bonds well to all metal substrates</li> </ul>

LOCTITE® EA 3471 is a steel reinforced, two-part epoxy repair putty that cures to a metal-like finish and can be machined, drilled, tapped or filed. Typical applications include repairing non-structural defects in castings, making jigs and fixtures, sealing vessels, tanks and valves, resurfacing worn air seals and filling cavitated areas. This product is typically used in applications with an operating range of -30 °C to 105 °C.

### Typical properties of uncured material

#### Resin

Density @ 22°C, g/ml 2.43

#### Hardener

Density @ 22°C, g/ml 1.08

#### Mixed

Weight per volume kg/L 2.64 to 2.76  
(lbs/gal) (22 to 23)

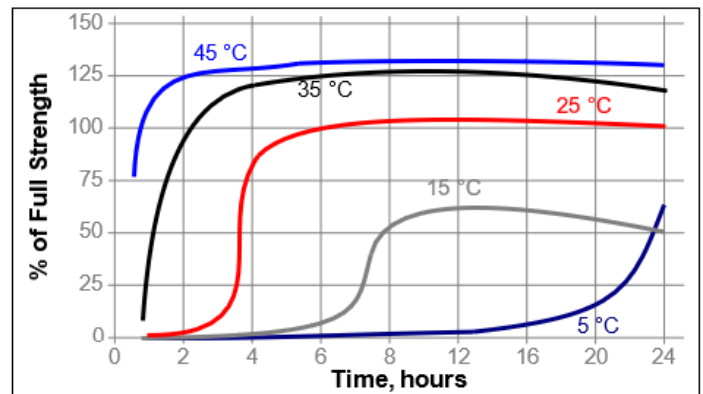
Flash point - see SDS

### Typical curing performance

Gel time @ 21°C, minutes 35 to 40  
Working life, minutes 30

### Cure speed vs. temperature

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



### Typical properties of cured material

Cured @25°C except where noted

#### Physical properties:

Tensile Strength, ISO 527-2	N/mm <sup>2</sup> (psi)	27.8 (4,040)
Tensile Modulus, ASTM D638	N/mm <sup>2</sup> (psi)	9,360 (1,357,180)
Compressive strength, ISO 604	N/mm <sup>2</sup> (psi)	61.7 (8,940)
Compressive modulus, ISO 604	N/mm <sup>2</sup> (psi)	3,400 (521,740)
Flexural strength , ASTM D790	N/mm <sup>2</sup> (psi)	56.4 (8,190)
Flexural modulus	N/mm <sup>2</sup> (psi)	3,500 (507,000)

Shore Hardness, ISO 868, Durometer D	82
Glass Transition Temperature, ASTM E 1640, °C	60
Coefficient of thermal expansion, ISO 11359-2, K-1::	
Below Tg	$43 \times 10^{-6}$
Above Tg	$125 \times 10^{-6}$
Elongation, ISO 527-2, %	0.49
Volume shrinkage, %	1.63
Abrasion resistance, ASTM D4060: mg	0.523
1 kg load, CS-10 wheels, weight of material lost	156

#### Typical performance of cured material

##### Electrical properties:

Volume resistivity, IEC 60093, $\Omega$ -cm	$1.1 \times 10^{15}$
Surface resistivity, IEC 60093, $\Omega$	$3.1 \times 10^{15}$

##### Shear strength

Lap shear strength:	N/mm <sup>2</sup>	9.6
Grit blasted mild steel (GBMS)	(psi)	(1,395)

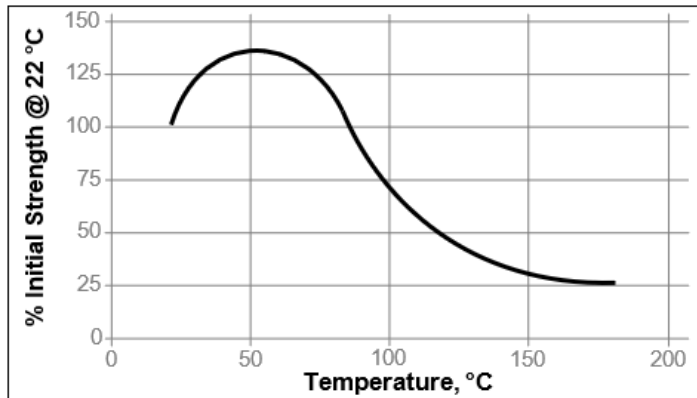
#### Typical environmental resistance

Cured for 72 hours @ 21 °C

Lap shear strength:	
Grit blasted mild steel (GBMS)	

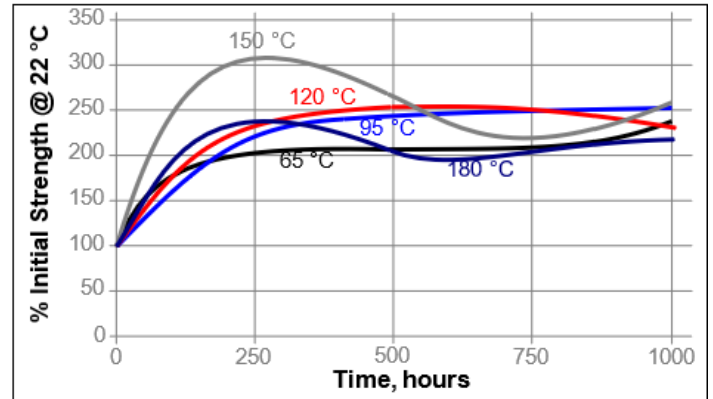
#### Hot Strength

Tested at temperature



#### Heat aging

Aged at temperature indicated and tested @ 22 °C.



#### 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.

#### 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.

#### Surface preparation

Proper surface preparation is critical to the long-term performance of this product.

#### Directions for use

1. Remove dirt, oil, grease, etc. with a suitable cleaner, e.g. high pressure water cleaning system using Loctite® SF 7840™ (Loctite® Natural Blue® cleaner/degreaser).
2. Blast all surfaces to be coated with a sharp edged angular grit to a depth of profile of 75 to 100 microns and a degree of cleanliness of Near White Metal (SIS SA 2½ /SSPC-SP 10).
3. After blasting, metal surfaces should be cleaned with waterless cleaner, e.g. with Loctite® SF 7611™ (Loctite® Pro Strength Parts Cleaner), and be coated before any oxidation or contamination takes place.
4. Metal that has been in contact with salt solutions, e.g. seawater, should be grit blasted, high-pressure water blasted, and 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

Mix resin and hardener according to mix ratios listed or transfer entire kit onto a clean and dry mixing surface and mix material vigorously until a uniform color is obtained. 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.

#### Inspection

Visually inspect for pinholes and misses just after application. Once the coating has cured, repeat visual inspection to confirm it is free from pinholes, misses and mechanical damages. Control thickness of the coating, especially in the critical points. Perform a test with a holiday detector to confirm coating points.



**Coverage**

To achieve a 6 mm (.25 in) thickness, the coverage rate will be 278cm<sup>2</sup> (43in<sup>2</sup>) for 0.45kg (1lb), excluding overthickness, repairs, etc.

**Repairs**

Any voids, pinholes, 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 LOCTITE® solvent based cleaner. Once cured, the material can only be removed mechanically.

**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 (37°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.
- Pre-heat repair surface until warm to the touch.

To slow the cure of epoxies at high temperatures:

- Mix epoxy in small masses to prevent rapid curing.
- Cool resin/hardener component(s).

**Not for product specifications**

The technical data contained herein are intended as reference only. Please contact your local quality department for assistance and recommendations on the specifications of this product.

**Storage**

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

**Conversions**

$$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$$

$$\text{kV/mm} \times 25.4 = \text{V/mil}$$

$$\text{mm} / 25.4 = \text{inches}$$

$$\mu\text{m} / 25.4 = \text{mil}$$

$$\text{N} \times 0.225 = \text{lb}$$

$$\text{N/mm} \times 5.71 = \text{lb/in}$$

$$\text{N/mm}^2 \times 145 = \text{psi}$$

$$\text{MPa} \times 145 = \text{psi}$$

$$\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$$

$$\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$$

$$\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$$

$$\text{mPa}\cdot\text{s} = \text{cP}$$

**Disclaimer**

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. Any liability in respect of the information in the Technical data sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

**In case products are delivered by Henkel Belgium NV, Henkel Electronic Materials NV, Henkel Nederland BV, Henkel Technologies France SAS and Henkel France SA please additionally note the following:**

In case Henkel would be nevertheless held liable, on whatever legal ground, Henkel's liability will in no event exceed the amount of the concerned delivery.

**In case products are delivered by Henkel Colombiana, S.A.S. the following disclaimer is applicable:**

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. 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. Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.



**In case products are delivered by Henkel Corporation, or Henkel Canada Corporation, the following disclaimer is applicable:**

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability 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 and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

**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 0.1