



LOCTITE® EA 3478™

November 2016

Product description

LOCTITE® EA 3478™ provides the following product characteristics:

Technology	Epoxy
Chemical type	Epoxy
Appearance (resin)	Metallic gray
Appearance (hardener)	White
Appearance (mixed)	Gray
Components	Two components - resin & hardener
Mix Ratio, (by weight) resin : hardener	7.25 : 1
Mix Ratio, (by volume) resin : hardener	4 : 1
Cure	Room temperature cure after mixing
Application	Surface repair
Application temperature	15°C to 30°C (59°F to 86°F)
Specific benefits	• Resurfaces and repairs worn or corroded metal parts • Ferro-silicon filled system- cures to metal-like finish • Rebuilds worn parts fast-limits downtime • Excellent machinability • Resists corrosion, abrasion, and chemicals

LOCTITE® EA 3478™ is a two-part ferro-silicon filled, 100% solid epoxy resin system. It is ideal for restoring parts worn by mechanical impact and/or corrosion. Typical applications are restoring tolerances to worn shafts, repairing worn keyways, repairing damaged housings, filling pitted surfaces in worn machinery, and restoring fit to bearing housings.

Typical properties of uncured material

Resin

Specific gravity @ 25°C	2.5 to 2.71
Viscosity, brookfield - DVT, 25°C, mPa·s (cP): Spindle 7, speed 100 rpm	1,200,000 to 2,100,000

Hardener

Specific gravity @ 25°C	1.42 to 1.48
Viscosity, brookfield - DVT, 25°C, mPa·s (cP): Spindle 7, speed 100 rpm	1,800,000 to 3,000,000

Mixed

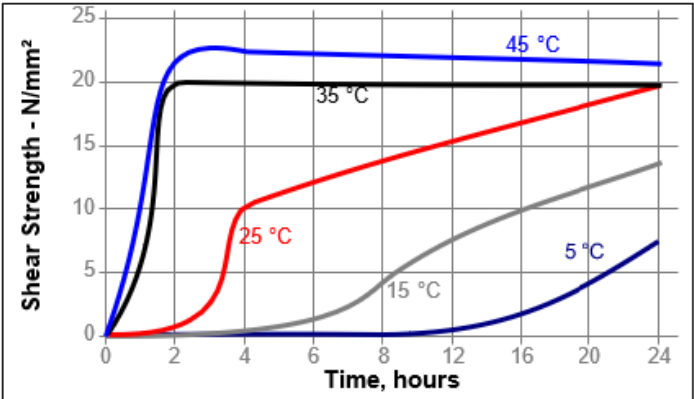
Specific gravity @ 25°C	2.13
Viscosity, Cone & Plate, 25 °C, mPa·s (cP):	3,194,000

Typical curing performance

Working life, minutes	20
-----------------------	----

Cure speed vs. temperature

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



Physical properties:

Tensile Strength, ISO 527-2	N/mm ² (psi)	27 (3,900)
Tensile Modulus, ISO 527-2	N/mm ² (psi)	8,770 (1,271,900)
Compressive strength, @65°C, ISO 604	N/mm ² (psi)	134 (19,490)
Compressive modulus, @65°C, ISO 604	N/mm ² (psi)	7,530 (1,077,616)
Glass transition temperature (Tg), TMA, ISO 11359-2, °C		67
Coefficient of Thermal Expansion, ISO 11359-2, K ⁻¹ :		
Below Tg		47×10 ⁻⁶
Above Tg		161×10 ⁻⁶
Shore Hardness, ISO 868, Durometer D		86
Elongation, ASTM D638, %		0.35
Volume shrinkage, ISO 1675, %		5
Coefficient of thermal conductivity ISO 8302, W/(m·K)		0.52



Typical performance of cured material**Physical properties:**

Abrasion resistance, ASTM D4060, mg 1kg load, CS-10 wheels, weight of material lost	127
---	-----

Electrical properties:

Surface resistivity, IEC 60093, Ω	470×10^{12}
Surface resistivity, IEC 60093, $\Omega \cdot \text{cm}$	210×10^{12}

Adhesive properties:

Lap Shear Strength, ISO 4587: Mild steel (grit blasted)	N/mm ² (psi)	19.5 (2,820)
--	----------------------------	-----------------

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.

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. 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.
5. Mix 4 part resin to 1 part hardener by volume (7.25 to 10 by weight) or transfer entire kit onto a clean and dry mixing surface and mix thoroughly until color is consistent.
6. Apply fully mixed material to prepared surface.

- Machine the worn area down 3mm (0.125 in) to produce a square shoulder on part. The material is stronger with a square edge versus a feathered edge.
- Machine a spiral cut in bottom of area to be repaired to provide mechanical keying into surface.
- Apply excess product to ensure small shrinkage during cure does not produce depression.
- Machine the surface to original dimensions prior to full cure, as the product is very wear resistant.

Inspection

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

Coverage

To achieve a 6 millimeter (236 mils) thickness, the coverage rate will be 0.245 m² (2.64 ft²) for 3 kg (6.6 lb), 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.

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.

Product specification

The technical data contained herein are intended as reference only and are not considered specifications for the product. Product specifications are located on the Certificate of Analysis or please contact Henkel representative.

Approval and Certificate

Please contact Henkel representative for related approval or certificate of this product.



Data ranges

The data contained herein may be reported as a typical value. Values are based on actual test data and are verified on a periodic basis.

Temperature/Humidity Ranges: 23°C / 50% RH = 23±2°C / 50±5% RH

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

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 2