

LOCTITE® EA 445

Known as LOCTITE® Fixmaster® Fast Cure Epoxy Mixercups
January 2015

PRODUCT DESCRIPTION

LOCTITE® EA 445 provides the following product characteristics:

Technology	Epoxy
Appearance (Resin)	Off-white to pale gray paste
Appearance (Hardener)	Black paste
Appearance (Mixed)	Gray
Components	Two components - requires mixing
Cure	Room temperature cure
Application	Bonding
Specific Benefit	- Bonds virtually any material - Repair, fill and seal holes, cracks and worn surfaces - May be drilled, tapped, sanded or machined and painted after cure

LOCTITE® EA 445 is a two-component, room temperature curing epoxy adhesive used for high strength, permanent bonding of metals, ceramics, concrete, wood and most plastics. This product can withstand temperatures of up to 80°C (180F). Typical applications include the production, maintenance and prototype bonding of metals, ceramics, concrete, wood, glass and most plastics.

NOTE: LOCTITE® EA 445 are not recommended for polyethylene and polypropylene.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Resin:

Specific Gravity, g/cm³ 1.68

Flash Point - See SDS

Hardener:

Specific Gravity, g/cm³ 1.4

Flash Point - See SDS

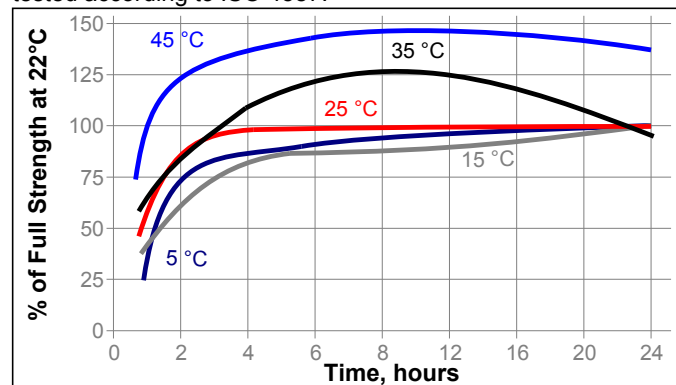
TYPICAL CURING PERFORMANCE

Curing Properties

Gel Time @ 25 °C, minutes 2 to 3

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:

Abrasion Resistance, ASTM D4060: mg 103

1 Kg load, CS-10 wheels, Weight of Material Lost

Shore Hardness, ISO 868, Shore D 87

Flexural strength, ASTM D790 N/mm² 55
(psi) (7,960)

Flexural modulus, ASTM D790 N/mm² 5,410
(psi) (784,600)

Compressive Strength, ISO 604 N/mm² 91
(psi) (13,260)

Compressive Modulus, ISO 604 N/mm² 5,425
(psi) (786,300)

Tensile Strength, ISO 527-2 N/mm² 26.3
(psi) (3,815)

Tensile Modulus, ISO 527-2 N/mm² 7,600
(psi) (1,102,320)

Elongation, ISO 527-2, % 0.53

Coefficient of Thermal Conductivity ASTM F 433, W/(m·K) 0.492

Glass Transition Temperature, ASTM E 1640, °C 51

Coefficient of Thermal Expansion, ISO 11359-2 K⁻¹:

Below Tg 39×10⁻⁶

Above Tg 135×10⁻⁶

Electrical Properties:

Volume Resistivity, IEC 60093, ohm-cm	0.11×10^{15}
Surface Resistivity, IEC 60093, ohms	0.1×10^{15}

TYPICAL PERFORMANCE OF CURED MATERIAL**Shear Strength**

Lap Shear Strength, ISO 4587:

Grit Blasted Mild Steel (GBMS)	N/mm ² 13.5
	(psi) (1,955)

TYPICAL ENVIRONMENTAL RESISTANCE

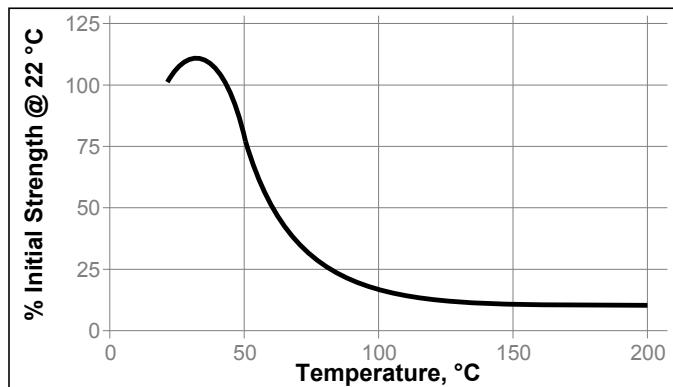
Cured for 72 hours @ 21 °C

Lap Shear Strength, ISO 4587:

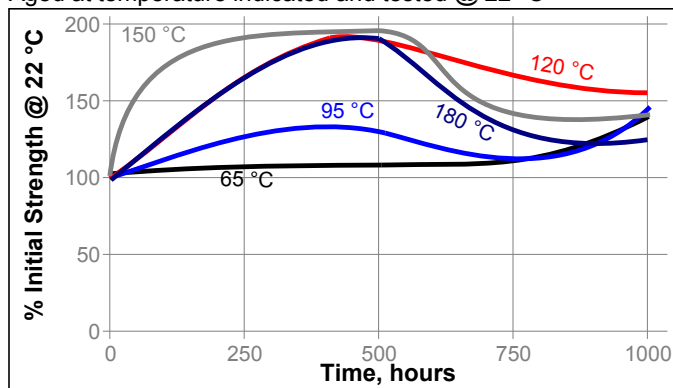
Grit Blasted Mild Steel (GBMS)

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 Safety Data Sheet (SDS).

Directions for use:

1. Bond areas should be clean and free from grease. Clean all surfaces with a Loctite® cleaning solvent and allow to dry.
2. For maximum strength, surface abrasion is recommended. A fine to medium grit emery cloth or sandpaper is best. Wash after abrading.
3. Peel off the clear plastic rim from the top of the mixer cup.
4. Depress the center of the cup with the enclosed mix stick to form the mixing bowl.
5. Scrape hardener from rim into the bottom of the mix cup with resin using mix stick.
6. Mix until the product has a uniform color. The adhesive is packaged in a pre-measured kit. This ensures consistent performance since resin and hardener are always properly measured.
7. For maximum bond strength apply adhesive evenly to both surfaces to be joined.
8. Application to the substrates should be made within 5 minutes. Larger quantities and/or higher temperatures will reduce this working time.
9. Join the adhesive coated surfaces and allow to cure. Higher temperatures will speed up curing.
10. Keep assembled parts from moving during cure. The bond should be allowed to develop full strength before subjecting to any service load.
11. Excessive uncured adhesive can be cleaned up with ketone type solvents.

Technical Tips for Working With Epoxies

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 specifications for this product.

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

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

Note:

The 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.

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Reference 0.1