



LOCTITE[®] Fixmaster[®] Superior Metal

February 2013

PRODUCT DESCRIPTION

LOCTITE[®] Fixmaster[®] Superior Metal provides the following product characteristics:

Technology	Epoxy
Chemical Type	Epoxy
Appearance - Part A	Metallic gray ^{LMS}
Appearance - Part B	White ^{LMS}
Appearance (Mixed)	Thick dark gray paste
Components	Two components - requires mixing
Mix Ratio, by volume - Resin : Hardener	4 : 1
Mix Ratio, by weight - Resin : Hardener	7.25 : 1
Cure	Room temperature cure
Application	Industrial maintenance
Specific Benefit	<ul style="list-style-type: none"> • High ferro-silicon content • Resists corrosion, abrasion, and chemicals • Rebuilds worn parts fast - limits downtime • Superior adhesion - forms a solid bond • Long lasting

LOCTITE[®] Fixmaster[®] Superior Metal is a two-part ferro-silicon filled epoxy resin system. It is extremely resistant to corrosion, chemical attack, and abrasion under typical dry service temperatures of -30 °C to 120 °C (-20F to 250F). It is ideal for restoring parts worn by mechanical and/or corrosion impact. This product contains no iron or steel fillers which can corrode over time. 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

Specific Gravity @ 25 °C	2.5 to 2.71 ^{LMS}
Viscosity, Brookfield - RV, 25 °C, mPa·s (cP): Spindle TF, speed 2.5 rpm,	1,200,000 to 2,100,000 ^{LMS}

Flash Point - See MSDS

Hardener:

Specific Gravity @ 25 °C	1.42 to 1.48 ^{LMS}
Viscosity, Brookfield - RV, 25 °C, mPa·s (cP): Spindle TF, speed 2.5 rpm,	1,800,000 to 3,000,000 ^{LMS}

Flash Point - See MSDS

Mixed:

Specific Gravity @ 25 °C	2.13
Coverage	232 cm ² @ 6 mm thick per 0.45 kg kit (36 in ² @ 0.25 in thick per 1 lb kit)

Flash Point - See MSDS

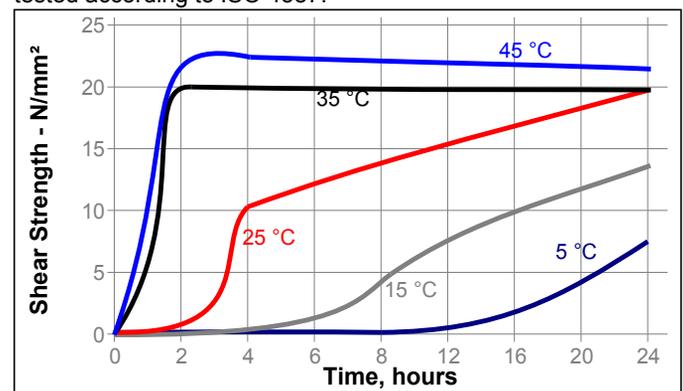
TYPICAL CURING PERFORMANCE

Curing Properties

Gel Time @ 21 °C, minutes	25 to 35
Functional Cure Time @ 25 °C, hours	6
Full Cure Time @ 25 °C, hours	24

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**Physical Properties:**

Abrasion Resistance, ASTM D4060: mg 1 Kg load, CS-10 wheels, Weight of Material Lost	127
Shore Hardness, ISO 868, Shore D	86
Coefficient of Thermal Conductivity ASTM F 433, W/(m·K)	0.52
Volume Shrinkage, ISO 1675 %	5.0
Glass Transition Temperature ISO 11359-2, °C	67
Coefficient of Thermal Expansion, ISO 11359-2, K ⁻¹ :	
Below Tg	47
Above Tg	161×10 ⁻⁰⁶
Compressive Strength, ISO 604	N/mm ² 68 (psi) (9,920)
Compressive Modulus, ISO 604	N/mm ² 5,055 (psi) (733,000)
Tensile Strength, ISO 527-2	N/mm ² 27 (psi) (3,900)
Tensile Modulus, ISO 527-2	N/mm ² 8,770 (psi) (1,271,900)
Elongation at break, %	0.35
Flexural strength, ASTM D790	N/mm ² 54 (psi) (7,800)
Flexural modulus, ASTM D790	N/mm ² 6,380 (psi) (924,700)

Electrical Properties:

Volume Resistivity, IEC 60093, ohm-cm	210×10 ¹²
Surface Resistivity, IEC 60093, ohms	470×10 ¹²

TYPICAL PERFORMANCE OF CURED MATERIAL

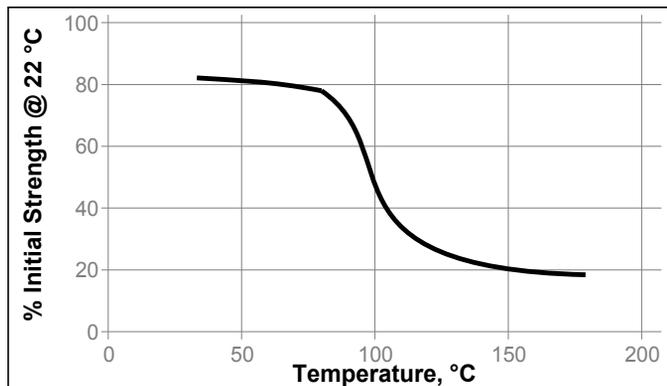
Lap Shear Strength, ISO 4587: Grit Blasted Mild Steel (GBMS)	N/mm ² 19.5 (psi) (2,820)
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TYPICAL ENVIRONMENTAL RESISTANCE

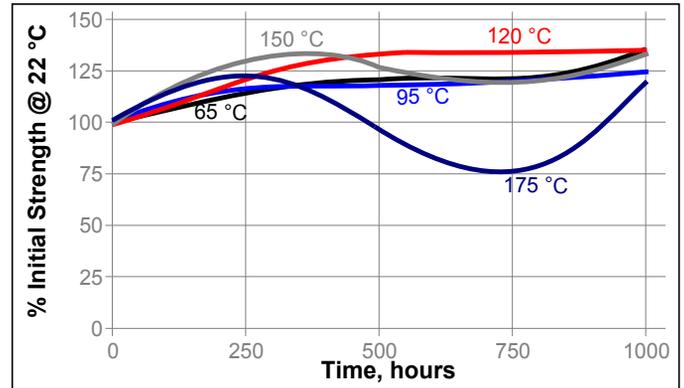
Lap Shear Strength, ISO 4587: Grit Blasted Mild Steel (GBMS)

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 Material Safety Data Sheet (MSDS).

Directions for use:

- Clean and dry surface of application. Grind or sandblast surface for best adhesion. Material works best on rough surface.
- Mix 4 parts resin to 1 part hardener by volume (7.25 to 1 by weight), or transfer entire kit onto a clean and dry mixing surface and mix thoroughly until color is consistent.
- Apply fully mixed material to prepared surface.
- At 25°C, the working time is 20 minutes and functional cure time is 6 hours.
- If using to rebuild shaft, the following applies:
 - 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.

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).

Loctite Material Specification^{LMS}

LMS dated April 28, 2001 (Part A) and LMS dated April 3, 2001 (Part B). 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

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

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Reference 1.3