

LOCTITE® MR 2000™

Known as LOCTITE® Fixmaster® 2000 Degree Putty
April 2015

PRODUCT DESCRIPTION

LOCTITE® MR 2000™ provides the following product characteristics:

Technology	Water-based Adhesive
Chemical Type	Silicic Acid
Appearance	Silver Gray Putty
Components	One component - requires no mixing
Cure	Room Temperature or Heat Cure
Application	Repair compound
Specific Benefit	• Makes reliable high temperature repairs • Excellent adhesion to cast iron, cast aluminum, and carbon steels • One part design, no mixing, no measuring • Cures to a metal finish • Can be ground and sanded to a smooth finish

LOCTITE® MR 2000™ is an extreme temperature repair putty that withstands environments up to 1,000°C (2,000°F). It is an environmentally non-toxic, water based compound which is non-flammable and contains no solvents or volatile compounds. Typical applications include repairs of boiler doors and casings, exhaust stacks, defective molds, crucibles and dies, flanges, sagger plates, refractory bricks and ceramic tiles. It can also be used in automotive exhaust applications, in headers, manifolds, catalytic converters and exhaust ports. It is NOT for use in sealing engine block or cylinder head coolant leaks.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity, g/cm³	1.54
Coverage	620 cm² @ 0.25 cm thick/225 gm (96 in² @ 0.1 inch thick/8 ounce)
Flash Point - See SDS	

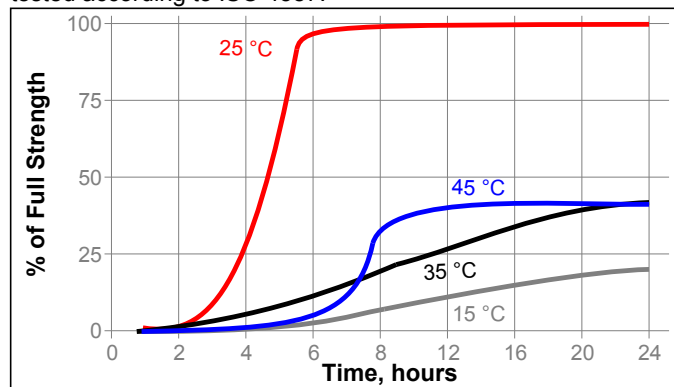
TYPICAL CURING PERFORMANCE

Curing Properties

Cure Time @ 25 °C, hours	5 to 7
--------------------------	--------

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	115
1 Kg load, CS-10 wheels, Weight of Material Lost	
Shore Hardness, ISO 868, Shore D	88
Compressive Strength, ISO 604	N/mm² 2.4 (psi) (350)
Compressive Modulus, ISO 604	N/mm² 295 (psi) (42,620)
Glass Transition Temperature, ASTM E 1640, °C	85
Coefficient of Thermal Expansion, ISO 11359-2 K⁻¹:	
Below Tg	7×10⁻⁶

TYPICAL PERFORMANCE OF CURED MATERIAL

Shear Strength

Lap Shear Strength, ISO 4587:	
Grit Blasted Mild Steel (GBMS)	N/mm² 2.4 (psi) (350)

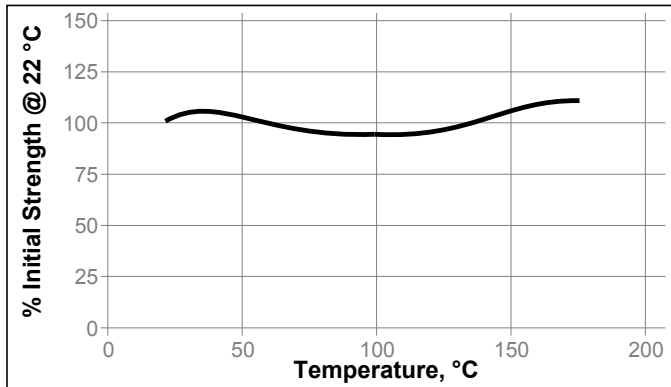
TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 72 hours @ 21 °C

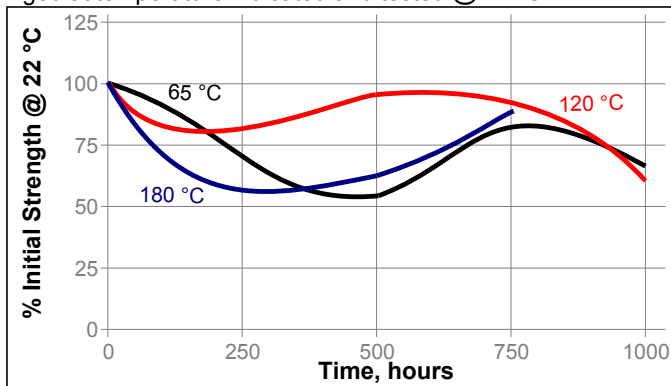
Lap Shear Strength, ISO 4587:	
Grit Blasted Mild Steel (GBMS)	

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. Success with LOCTITE® MR 2000™ depends on proper bond to substrate. Abrading, cleaning, and drying the surface will promote proper adhesion to the affected surface.
2. Mix thoroughly before using.
3. Apply LOCTITE® MR 2000™ to a maximum thickness of 0.95 cm (0.38 in). Cracks or holes bigger than this should be repaired using expanded mesh or screen. First apply product, then form the screen and apply a second coat of product to embed the screen completely.
4. Air dry for 5 to 7 hours. Heat cure is not required if operating temperature exceeds 205°C (400 F), otherwise, heat cure at 95°C (200 F) for 3 hours.
5. This product will shrink slightly when cured. Allow enough material for shrinkage.

6. Do Not Apply To Hot Surfaces! Rapid evaporation of the material will entrap bubbles in the product and create voids affecting the performance of the product. Warm surfaces are preferred.

7. Putty may be drilled, tapped, machined after it is fully cured.

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.

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, Resin Technology Group, Inc., 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