



LOCTITE[®] HF8600[™]

August 2010

PRODUCT DESCRIPTION

LOCTITE[®] HF8600[™] provides the following product characteristics:

Technology	Acrylic
Chemical Type	Methacrylate
Appearance (Part A)	Clear gel
Appearance (Part B)	Blue gel
Appearance (Mixture)	Light blue ^{LMS}
Cure	Room temperature cure
Components	Two component - requires mixing
Mix Ratio, by volume - Part A: Part B	2 : 1
Product Benefits	<ul style="list-style-type: none"> • Weight & Cost reduction • Improved durability • Improved appearance • Bond dissimilar substrates
Application	Bonding

LOCTITE[®] HF8600[™] is a toughened, two component acrylic adhesive system designed with low halogen content for structural bonding and weld/rivet reduction. It is well suited for metal bonding applications where shock and impact resistance is required. The product cures very rapidly forming tough, resilient bonds. Once statically mixed, the two component acrylic cures at room temperature. Cure times can be reduced with the addition of mild heat to the bonded assemblies. LOCTITE[®] HF8600[™] is formulated with 0.127 mm spacers pre-dispersed within the adhesive to ensure that the adhesive bond area has adequate gap for optimal shock and impact performance. Typical applications include structural bonding of plastic and metal components that must withstand vibrations and impacts such as in portable devices and specialty vehicle markets.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Part A:

Specific Gravity @ 25 °C 0.99
 Viscosity, Cone & Plate, 25 °C, mPa·s (cP):
 PHYSICA MCR300 @ shear rate 50 min⁻¹ 15,000 to 35,000^{LMS}
 Flash Point - See MSDS

Part B:

Specific Gravity @ 25 °C 0.97
 Viscosity, Cone & Plate, 25 °C, mPa·s (cP):
 PHYSICA MCR300 @ shear rate 50 min⁻¹ 15,000 to 35,000^{LMS}
 Flash Point - See MSDS

Mixed:

Specific Gravity @ 25 °C 0.98
 Viscosity, Cone & Plate, 25 °C, mPa·s (cP):
 Cone CP50-1 @ shear rate 50 s⁻¹ 25,600

Working Time @ 25 °C, minutes
 (maximum time before assembly):
 Steel 13
 Aluminium 13
 Polyethylene 13

Working life, minutes 3.8
 (Time for mixed viscosity to double)

Ionic Contaminants, ppm:
 Chlorine ≤900^{LMS}
 Bromine ≤900^{LMS}
 Halogen ≤1,500^{LMS}

Flash Point - See MSDS

TYPICAL CURING PERFORMANCE

Fixture Time

Fixture time is defined as the time to develop a shear strength of 0.1 N/mm².

Fixture Time, ISO 4587, minutes:
 Mild Steel 5 to 10

Peak Exotherm Temperature

Peak Exotherm Temperature, 10 gram mass:
 Peak Temperature Time, minutes 11 to 22^{LMS}
 Peak Temperature, °C ≥212

TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

Glass Transition Temperature (Tg) 65
 , ISO 11359-2, °C
 Coefficient of Thermal Expansion, ISO 11359-2 K⁻¹:
 Pre Tg 84×10⁻⁰⁶
 Post Tg 173×10⁻⁰⁶
 Shore Hardness, ISO 868, Durometer D 69
 Linear Shrinkage, ISO 1675 % 5
 Volume Shrinkage, ISO 1675 % 14
 Elongation, at break, ISO 527-2, % 13
 Elongation, at yield, ISO 527-2, % 7
 Tensile Strength, at yield, ISO 527-2 N/mm² 17
 (psi) (2,410)
 Tensile Strength, at break, ISO 527-2 N/mm² 15
 (psi) (2,200)
 Tensile Modulus, ISO 527-2 N/mm² 1,120
 (psi) (162,390)

TYPICAL PERFORMANCE OF CURED MATERIAL**Adhesive Properties**

Cured for 24 hours @ 24 °C

Lap Shear Strength, ISO 4587:

Steel (ground)	N/mm ²	≥10.33 ^{LMS}
	(psi)	(≥1,497)

Cured for 72 hours @ 22 °C.

Impact Strength, ISO 9653, J:

Grit Blasted Mild Steel (GBMS)	26
Aluminum (abraded)	2
Grit Blasted Mild Steel (GBMS) @ -40 °C	29

"T" Peel Strength, ISO 11339:

Steel	N/mm	14
	(lb/in)	(80)
Aluminum	N/mm	5
	(lb/in)	(30)

Block Shear Strength, ISO 13445:

Ferrite Magnet to Steel	N/mm ²	15
	(psi)	(2,130)
Glass	N/mm ²	8
	(psi)	(1,230)
Acrylic	N/mm ²	2.5
	(psi)	(370)
Epoxy	N/mm ²	4
	(psi)	(620)
ABS	N/mm ²	1.5
	(psi)	(220)
PVC	N/mm ²	6
	(psi)	(830)
Polycarbonate	N/mm ²	2
	(psi)	(250)
Phenolic	N/mm ²	6
	(psi)	(890)

Lap Shear Strength, ISO 4587:

Grit Blasted Mild Steel (GBMS)	N/mm ²	15
	(psi)	(2,120)
Aluminum	N/mm ²	17
	(psi)	(2,430)
Stainless Steel	N/mm ²	16
	(psi)	(2,300)
Galvanized Steel	N/mm ²	3
	(psi)	(400)
FRP	N/mm ²	7
	(psi)	(1,035)
Gelcoat	N/mm ²	7
	(psi)	(1,035)

TYPICAL ENVIRONMENTAL RESISTANCE

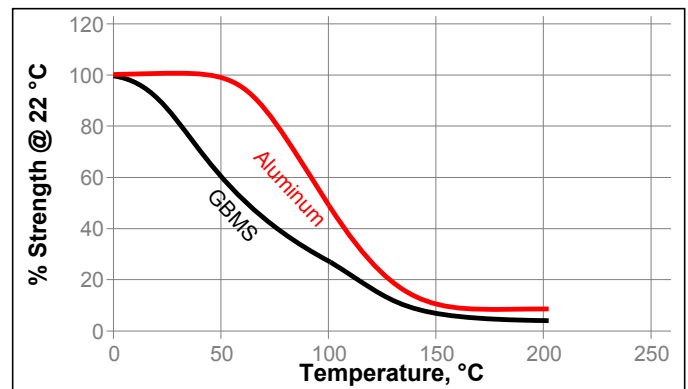
Cured for 72 hours @ 22 °C

Lap Shear Strength, ISO 4587:

Grit Blasted Mild Steel (GBMS)

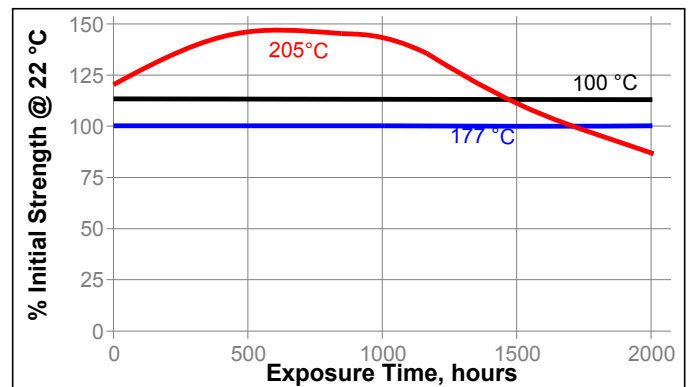
Hot Strength

On: Galvanized Steel

**Heat Aging**

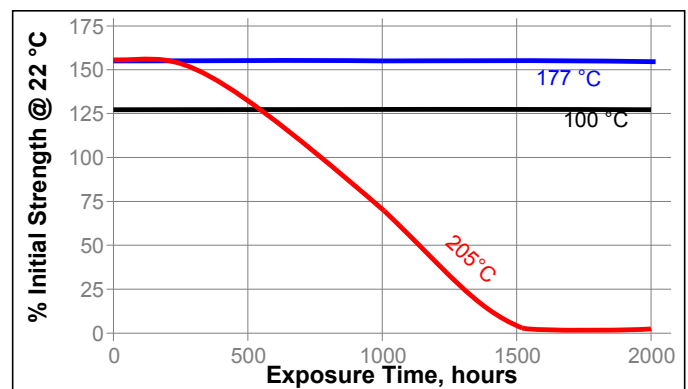
Aged at temperature indicated and tested @ 22 °C

On: Grit Blasted Mild Steel (GBMS)

**Heat Aging**

Aged at temperature indicated and tested @ 22 °C

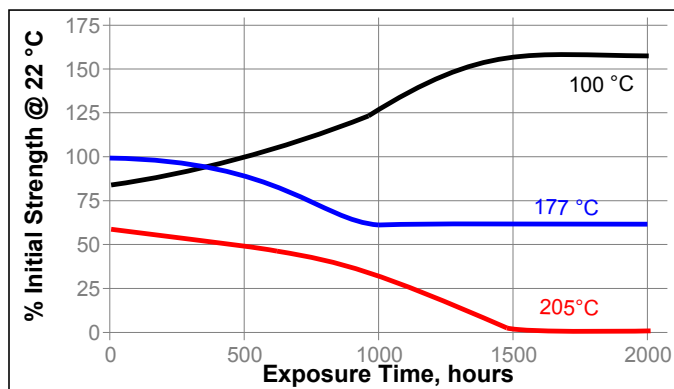
On: Aluminum



Heat Aging

Aged at temperature indicated and tested @ 22 °C

On: Galvanized Steel

**Chemical/Solvent Resistance**

Aged under conditions indicated and tested @ 22°C.

On: Grit Blasted Mild Steel (GBMS)

Environment	°C	% of initial strength	
		500 h	1000 h
Air	87	115	105
Motor oil (10W30)	87	55	55
Unleaded gasoline	87	10	10
Water/glycol 50/50	87	50	15
Water	22	85	85
Acetone	22	25	25
Isopropanol	22	100	100
Salt fog	35	95	80
Condensing Humidity	49	80	80
95% RH	40	100	100

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:

1. For high strength structural bonds, remove surface contaminants such as paint, oxide films, oils, dust, mold release agents and all other surface contaminants.
2. Use gloves to minimize skin contact. DO NOT use solvents for cleaning hands.

3. **Dual Cartridges:** To begin using a new cartridge, remove cartridge cap and dispense a small amount of adhesive, making sure both parts A&B are extruding. Attach nozzle and dispense approximately 25 to 50mm, before applying onto part to be bonded. Partially used cartridges can be stored with the mixing nozzle attached. To reuse, remove and discard old nozzle, attach the new nozzle, dispense approximately 25 to 50mm, before applying onto part to be bonded.

Bulk Containers: Normally material is dispensed through volumetric metered mixing equipment, attached to static mix nozzles.

4. For maximum bond strength apply adhesive evenly to both surfaces to be joined.
5. Application to the substrates should be made as soon as possible. Larger quantities and/or higher temperatures will reduce the working time.
6. Join the adhesive coated surfaces and allow to cure. Higher temperatures will speed up curing.
7. Keep assembled parts from moving during cure. The bond should be allowed to develop full strength before subjecting to any service load.
8. Excessive uncured adhesive can be cleaned up with ketone type solvents.

Loctite Material Specification^{LMS}

LMS dated August 18, 2010. 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 Quality.

Storage

The product is classified as flammable and must be stored in an appropriate manner in compliance with relevant regulations. Do not store near oxidizing agents or combustible materials. Store product in the unopened container in a dry location. Storage information may also be indicated on the product container labelling.

Optimal Storage: 2 °C to 8 °C. Storage below 2 °C or greater than 8 °C can adversely affect product properties.

Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel 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

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Reference 0.3