

LOCTITE® EA M-21HP™

Known as LOCTITE® M-21HP™
September 2020

PRODUCT DESCRIPTION

LOCTITE® EA M-21HP™ provides the following product characteristics:

Technology	Epoxy
Chemical Type	Epoxy
Appearance (resin)	Off-white to beige liquid
Appearance (hardener)	Light straw colored liquid
Appearance (mixed)	Off-white
Components	Two part - Resin & Hardener
Viscosity	Medium
Mix Ratio by Weight (Resin/Hardener)	100 : 55
Mix Ratio by Volume (Resin/Hardener)	2 : 1
Cure	Room temperature cure after mixing
Application	Bonding

LOCTITE® EA M-21HP™ cures at room temperature once mixed, to form a tough, off-white bondline which provides high peel resistance and high shear strengths. The fully cured epoxy is resistant to a wide range of chemicals and solvents, and acts as an excellent electrical insulator. LOCTITE® EA M-21HP™ high performance epoxy provides excellent bond strengths to a wide variety of substrates including glass, plastics and metals. Suitable for use in the assembly of **disposable medical devices**.

ISO-10993

LOCTITE® EA M-21HP™ has been tested to Henkel's test protocols based on ISO-10993 biocompatibility standards, as a means to assist in the selection of products for use in the medical device industry.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Resin

Specific Gravity @ 25°C	1.0
Viscosity, Brookfield - RVT @ 25 °C, mPa·s (cP): Spindle 7, Speed 20 rpm	65,000

Hardener

Specific Gravity @ 25°C	1.1
Viscosity, Brookfield - RVT @ 25 °C, mPa·s (cP): Spindle 6, Speed 50 rpm	7,000

Mixed

Specific Gravity @ 25°C	1.03
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TYPICAL CURING PERFORMANCE

Gel Time

Gel time, 22°C, minutes	10 to 25
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Working Life

Working life, minutes	20
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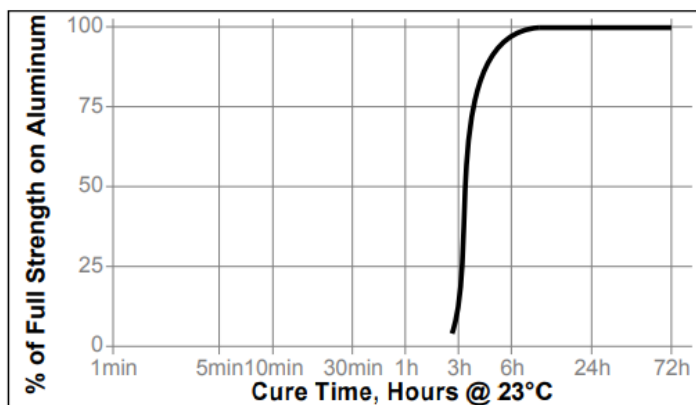
Tack Free Time

Tack Free Time is the time required to achieve a tack free surface

Tack Free Time, minutes	40
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Cure Speed vs. Time

The graph below shows shear strength developed with time on Aluminum (etched & abraded) lapshears @ 25°C with an average bondline gap of 0.1 to 0.2 mm and tested according to ISO 4587.



TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 5 hours @ 25 °C:

Physical Properties:

Glass Transition Temperature, ASTM E 228, °C	60
Elongation, ISO 527-2, %	8
Tensile Strength, ISO 527-2	N/mm ² 39 (psi) (5,700)
Shore Hardness, ISO 868, Durometer D: Cured @ 22°C for 16 to 18 hours followed by 2 hours @ 65°C	74 to 84

Electrical Properties:

Dielectric Breakdown Strength, IEC 60243-1, kV/mm	20
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Direction 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 use, simply insert the cartridge into the application gun and start the plunger into the cylinders using light pressure on the trigger. Next, remove the cartridge cap and expel a small amount of adhesive to be sure both sides are flowing evenly and freely. If automatic mixing of resin and hardener is desired, attach the mixing nozzle to the end of the cartridge and begin dispensing the adhesive. For hand mixing, expel the desired amount of the adhesive and mix thoroughly. Mix for approximately 15 seconds after uniform color is obtained.
4. For maximum bond strength apply adhesive evenly to both surfaces to be joined.
5. Application to the substrates should be made promptly. Larger quantities and/or higher temperatures will reduce this working time.
6. Join the adhesive coated surfaces and allow to cure at 25 °C for 24 hours for high strength. Heat up to 93 °C will speed curing.
7. Keep parts from moving during cure. Contact pressure is necessary. Maximum shear strength is obtained with a 0.1 to 0.2 mm bond line.
8. Excessive uncured adhesive can be cleaned up with ketone type solvents.

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 Henkel 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 1.4