



Strain Gage Adhesives

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General Information and Selection Guide

Because a strain gage can perform no better than the adhesive with which it is bonded to the test member, the adhesive is a vitally important component in every strain gage installation. Although there is no single adhesive ideally suited to all applications, Micro-Measurements offers a wide selection of adhesives to cover the spectrum of stress analysis testing, and for use in transducer manufacturing. Micro-Measurements adhesives are specially formulated and selected for highest performance under the recommended environmental conditions, and are packaged to provide for ease of mixing and application.

Each adhesive is accompanied by specific instructions for its proper handling — storage, mixing, application, curing, and, if appropriate, post-curing. The adhesive containers are also dated to assure freshness of the contents.

Note: It is usually misguided economy to attempt installing strain gages with outdated adhesive, or adhesive that has not been stored as recommended. It should also be noted that conventional industrial and consumer adhesives are not generally suitable for bonding strain gages.

Since different adhesives are intended for different types of applications and different environmental conditions, it is obviously important to select the most appropriate adhesive for each strain measurement task. The table below lists all of the Micro-Measurements adhesives, while the table on the following page is provided as a guide for selecting the most appropriate adhesive for compatibility with a particular strain gage series and test environment.

TYPES AND FEATURES	
M-Bond 200	Most widely used general-purpose adhesive. Easiest to handle. Fast room-temperature curing.
M-Bond AE-10	General-purpose adhesive that is highly resistant to moisture and most chemicals. Room-temperature curing.
M-Bond AE-15	Similar to AE-10. Recommended for more critical applications, including transducer gaging. Moderately elevated-temperature curing.
M-Bond 610	Used primarily in stress analysis applications over a wide temperature range, and in precision transducers. Elevated-temperature curing.
M-Bond 600	Similar to 610, but faster reacting. Can be cured at somewhat lower temperatures than 610.
M-Bond 43-B	Normally used in precision transducers. Highly resistant to moisture and chemical attack. Elevated-temperature curing.
M-Bond GA-2	Special-purpose adhesive primarily used on very rough and irregular surfaces. Room-temperature curing.
M-Bond GA-61	Special-purpose adhesive with a higher operating temperature range than GA-2, and more viscous. Also used to fill irregular surfaces and to anchor leadwires. Elevated-temperature curing
M-Bond A-12	Special-purpose, very high-elongation adhesive. Used only when other adhesives cannot meet elongation requirements. Elevated-temperature curing.
M-Bond 300	Special-purpose polyester adhesive used primarily when low-temperature curing is required. Sensitive to solvents. Not recommended as a general-purpose adhesive.
M-Bond 450	Special-purpose, high-performance epoxy for higher-temperature transducer applications.
Denex #3 Adhesive	One-part epoxy for lab and transducer work requiring minimal creep. Elevated temperature curing.
EpoxyLite 813	Used for long term, high temperature applications requiring a filled glueline. Wider temperature range than GA-61.
P Adhesive	Single-part solvent thinned polyimide adhesive. Excellent for long-term high temperature applications.
GC Cement	Single-part ceramic cement used for free-filament gages. Recommended for use on low TCE materials, such as carbon.
H Cement	One-part ceramic cement/coating used for free filament strain gages. Good adhesion to most metals.
PBx Cement	Two-part ceramic cement/coating used for free-filament strain gages. Good adhesion to most metals.
Sauereisen #8 Cement	Single-part chemical setting zircon-based cement used for free-filament strain gages. High electrical insulation and thermal conductivity.

General Information and Selection Guide

The two most important considerations for proper adhesive selection are compatibility with the backing material of the strain gage, and the operating temperature range over which the bond is expected to perform.

The chart below defines the recommended adhesive(s) for use with a particular strain gage series over various operating temperature ranges. When more than one adhesive is listed for a particular gage/test condition, preference would be given to the adhesive that is easiest to apply while still meeting all of the other performance criteria.

In addition to the primary adhesive selection criteria presented here, other factors (such as test duration, cyclic endurance required, and accuracy required) may have to be considered in the test profile. Detailed selection criteria are addressed in Tech Note TN-505, "Strain Gage Selection — Criteria, Procedures, Recommendations". There are many times when the interaction of test characteristics is too complex for selecting the proper adhesive from a chart with a high degree of confidence. In these cases, contact our Applications Engineering Department for recommendations.

RECOMMENDED ADHESIVES/STRAIN GAGE SERIES			
TYPE OF TEST OR APPLICATION	OPERATING TEMPERATURE RANGE	GAGE SERIES	M-BOND ADHESIVE
General Static or Static-Dynamic Stress Analysis	-50° to +150°F [-45° to +65°C]	CEA, EA	200 or AE-10 or AE-15
		WA, SA, WK, SK	AE-15 or 610
	-50° to +400°F [-45° to +205°C]	WA, SA, WK, SK	600 or 610
	-452° to +450°F [-269° to +230°C]	WK, SK	610
	<600°F [<315°C]	WK	610
High Elongation (Post-Yield)	-50° to +150°F [-45° to +65°C]	CEA, EA	200 or AE-10
		EP	AE-15 or A-12
Dynamic (Cyclic) Stress Analysis	-100° to +150°F [-75° to +65°C]	ED	200 or AE-10
		WD	AE-10 or AE-15
	-320° to +500°F [-195° to +260°C]	WD	600 or 610
Transducer Gaging	-50° to +150°F [-45° to +65°C]	CEA, EA	AE-10 or AE-15
	-50° to +200°F [-45° to +95°C]	N2A, J2A	600 or 610 or 43-B
	-50° to +300°F [-45° to +150°C]	WA, SA, TA, TK, J5K	610, 450, P Adhesive
	-320° to +350°F [-195° to +175°C]	WK, SK, TK, J5K	610, 450, P Adhesive
High Temperature Gaging	-452° to +700°F [-269° to +370°C]	WK, RK	P Adhesive
	-320° to +1600°F [-195° to +870°C]	ZC	H Cement

Strain Gage Adhesive



OTHER ACCESSORIES USED IN AN M-BOND 200 INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- GSP-1 Gauze Sponges
- CSP-1 Cotton Applicators
- PCT-2M Gage Installation Tape



RoHS
COMPLIANT

DESCRIPTION

For routine experimental stress analysis applications under temperate environmental conditions, M-Bond 200 adhesive is ordinarily the best choice. This adhesive is very easy to handle, and cures almost instantly to produce an essentially creep-free, fatigue-resistant bond, with elongation capability of five percent or more.

M-Bond 200 is a cyanoacrylate that has been pretested and certified for use in bonding strain gages. It is an excellent general-purpose adhesive for laboratory and short-term field applications. The procedure for making a strain gage installation with M-Bond 200 is illustrated and described in detail in Instruction Bulletin B-127 included in each kit of adhesive.

The user should note that the performance of the adhesive can be degraded by the effects of time, humidity conditions, elevated temperature, and moisture absorption. Because of the latter effect, strain gage installations should always be covered with a suitable protective coating. When necessitated by more rigorous test requirements and/or environmental conditions, consideration should be given to one of the M-Bond epoxy adhesives, using the "Recommended Adhesives/Strain Gage Series" chart.

CHARACTERISTICS

Cure Requirements:

One-minute thumb pressure, followed by a minimum two-minute delay before tape removal. Bond strength increases rapidly during first five minutes. Cure time must be extended under conditions of low temperature (<70°F [$<21^{\circ}\text{C}$]) or low humidity (<40% RH).

Operating Temperature Range:

Short Term: -300° to $+200^{\circ}\text{F}$ [-185° to $+95^{\circ}\text{C}$].

Long Term: -25° to $+150^{\circ}\text{F}$ [-32° to $+65^{\circ}\text{C}$].

Elongation Capabilities:

>5% at $+75^{\circ}\text{F}$ [$+24^{\circ}\text{C}$], 3% at $+75^{\circ}\text{F}$ [$+24^{\circ}\text{C}$] when used with CEA or EA/Option E strain gages.

Shelf Life:

Minimum 3 months at $+75^{\circ}\text{F}$ [$+24^{\circ}\text{C}$] after opening, with cap replaced immediately after each use. Shelf life refers to the duration of time, beginning on date of shipment, over which properly stored adhesive should be expected to meet published specifications.

Note: To ensure a proper seal, wipe bottle spout clean and dry before replacing cap.

May be stored unopened up to 3 months at $+75^{\circ}\text{F}$ [$+24^{\circ}\text{C}$] or 6 months at $+40^{\circ}\text{F}$ [$+5^{\circ}\text{C}$].

Note: Condensation rapidly degrades adhesive performance and shelf life; after refrigeration, allow adhesive to reach room-temperature before opening. Refrigeration after opening is not recommended.

PACKAGING OPTIONS

Kit:

1 bottle [1 oz/28g] Adhesive
1 brush-cap bottle [30ml] Catalyst
polyethylene dispenser cap

Bulk:

Adhesive — 1 bottle [1oz/28g]
Adhesive — 5 tubes [2g each]
Adhesive — 16 bottles [1oz/28g each]
Catalyst — 12 brush-cap bottles [30ml each]

Strain Gage Adhesive



OTHER ACCESSORIES USED IN AN M-BOND AE-10 INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- GSP-1 Gauze Sponges
- CSP-1 Cotton Applicators
- PCT-2M Gage Installation Tape
- HSC Spring Clamp
- GT-14 Pressure Pads and Backup Plates



RoHS
COMPLIANT

DESCRIPTION

Two-component, 100%-solids epoxy system for general-purpose stress analysis. Transparent, medium viscosity. Cure time as low as six hours at +75°F [+24°C] may be used. Elevated-temperature postcure is recommended for maximum stability, and/or tests above room temperature.

Highly resistant to moisture and most chemicals, particularly when postcured. For maximum elongation, bonding surface must be roughened. Cryogenic applications require very thin gluelines.

CHARACTERISTICS

Operating Temperature Range:

Long Term: -320° to +200°F [-195° to +95°C].

Elongation Capabilities:

1% at -320°F [-195°C];
6% to 10% at +75°F [+24°C];
15% at +200°F [+95°C].

Shelf Life:

Minimum 12 months at +75°F [+24°C]; or 18 months at +40°F [+5°C]. If crystals form in resin jar, heat to +120°F [+50°C] for 30 minutes. Cool before mixing.

Pot Life:

15 to 20 minutes at +75°F [+24°C]. Can be extended by cooling jar or by spreading adhesive on clean aluminum plate.

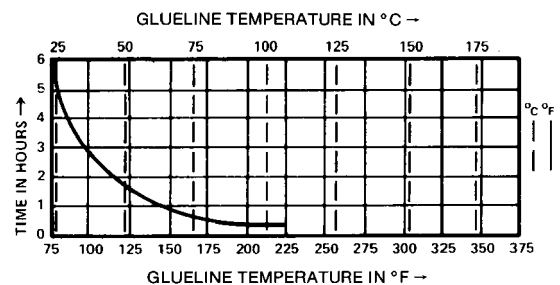
Clamping Pressure:

5 to 20psi [35 to 140kN/m²].

Cure Requirements:

Preferred Room-Temperature Cure: 24-48 hours at +75°F [+24°C].

Recommended Postcure: 2 hours at 25°F [15°C] above maximum operating temperature.



PACKAGING

Kit:

6 mixing jars [10g ea] Resin
1 bottle [15ml] Curing Agent 10
6 calibrated pipettes
6 stirring rods

Bulk:

200g Resin
40g Curing Agent 10
3 calibrated pipettes

References: Instruction Bulletin B-137, "Strain Gage Applications with M-Bond AE-10, AE-15, and GA-2 Adhesive Systems", included in each kit.

Strain Gage Adhesive



OTHER ACCESSORIES USED IN AN M-BOND AE-15 INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- GSP-1 Gauze Sponges
- CSP-1 Cotton Applicators
- PCT-2M Gage Installation Tape
- HSC Spring Clamp
- GT-14 Pressure Pads and Backup Plates



RoHS
COMPLIANT

DESCRIPTION

Two-component, 100%-solids epoxy system for general-purpose stress analysis. Transparent, medium viscosity. Cure time as low as six hours at +125°F [+50°C]. Recommended for more critical applications, including transducers. It has a longer pot life than M-Bond AE-10 which allows more time for multiple gage installations.

Elevated-temperature postcure is recommended for maximum stability, and/or tests above room temperature. Highly resistant to moisture and most chemicals, particularly when postcured. For maximum elongation, bonding surface must be roughened. Cryogenic applications require very thin gluelines.

CHARACTERISTICS

Operating Temperature Range:

Long Term: -452° to +200°F [-269° to +95°C].

Transducers: to +175°F [+80°C].

Elongation Capabilities:

2% at -320°F [-195°C];

10% to 15% at +75°F [+24°C];

15% at +200°F [+95°C].

Shelf Life:

Minimum 12 months at +75°F [+24°C]; or 18 months at +40°F [+5°C]. If crystals form in resin jar, heat to +120°F [+50°C] for 30 minutes. Cool before mixing.

Pot Life:

1-1/2 hours at +75°F [+24°C].

Clamping Pressure:

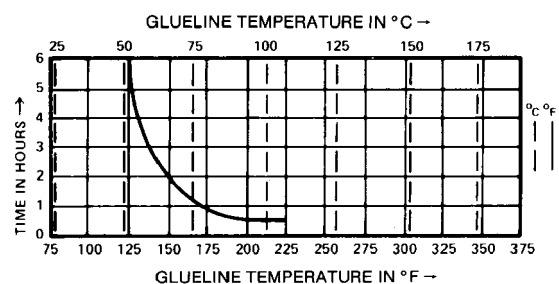
5 to 20psi [35 to 140kN/m²].

Cure Requirements:

Recommended PostCure: 2 hours at 25°F [15°C] above maximum operating temperature.

Optimum Performance Transducer Postcure:

1 hour at +200°F [+95°C].



PACKAGING OPTIONS

Kit:

- 6 mixing jars [10g ea] Resin
- 1 bottle [15ml] Curing Agent 15
- 6 calibrated pipettes
- 6 stirring rods

Bulk:

- 200g Resin
- 25g Curing Agent 15
- 3 calibrated pipettes

References:

Instruction Bulletin B-137, "Strain Gage Applications with M-Bond AE-10, AE-15, and GA-2 Adhesive Systems", included in each kit.

Strain Gage Adhesive



OTHER ACCESSORIES USED IN AN M-BOND 610 INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- GSP-1 Gauze Sponges
- CSP-1 Cotton Applicators
- MJG-2 Mylar® Tape
- TFE-1 Teflon® Film
- HSC Spring Clamp
- GT-14 Pressure Pads and Backup Plates



RoHS
COMPLIANT

DESCRIPTION

Two-component, solvent-thinned, epoxy-phenolic adhesive for high-performance applications, including high-precision transducers. Solids content 22%. Widest temperature range general-purpose adhesive available. Low viscosity, capable

of gluelines <0.0002 in [0.005mm]. Extremely thin, hard, void-free gluelines minimize creep, hysteresis, and linearity problems. Cure must begin within four hours of application.

CHARACTERISTICS

Operating Temperature Range:

Short Term: -452° to +700°F [-269° to +370°C].

Long Term: -452° to +500°F [-269° to +260°C].

Transducers: to +450°F [+230°C].

Elongation Capabilities:

1% at -452°F [-269°C];

3% at +75°F [+24°C];

3% at +500°F [+260°C].

Shelf Life:

Minimum 9 months at +75°F [+24°C]; or 15 months at +40°F [+5°C].

Pot Life:

6 weeks at +75°F [+24°C]; 12 weeks at +40°F [+5°C].

Clamping Pressure:

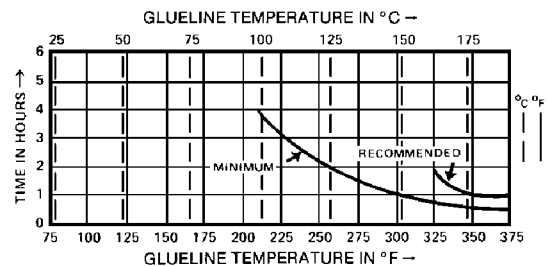
10 to 70psi [70 to 480kN/m²].

30 to 40psi optimum [200 to 275kN/m²].

Cure Requirements:

Recommended Postcure: 2 hours at 50° to 75°F [30° to 40°C] above maximum operating temperature or cure temperature, whichever is higher.

High Precision Transducer Postcure: 2 hours at +400° to +450°F [+205° to +230°C] after wiring.



PACKAGING OPTIONS

Kit:

- 4 bottles [11g ea] Curing Agent
- 4 bottles [14g ea] Resin
- 4 brush caps for dispensing mixed adhesive
- 4 disposable mixing funnels

Single Mix Kit:

- 1 bottle [11g ea] Curing Agent
- 1 bottle [14g ea] Resin
- 1 brush cap for dispensing mixed adhesive
- 1 disposable mixing funnel

References:

Instruction Bulletin B-130, "Strain Gage Installations with M-Bond 43-B, 600 and 610 Adhesive Systems," included in each kit.

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Strain Gage Adhesive



OTHER ACCESSORIES USED IN AN M-BOND 600 INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- GSP-1 Gauze Sponges
- CSP-1 Cotton Applicators
- MJG-2 Mylar® Tape
- TFE-1 Teflon® Film
- HSC Spring Clamp
- GT-14 Pressure Pads and Backup Plates



RoHS
COMPLIANT

DESCRIPTION

Similar to M-Bond 610 except with more reactive curing agent. Shorter shelf life, pot life, and working time than M-Bond 610, but has lower temperature cures and faster

reaction time. Cure must begin within 30 minutes of application (up to 4 hours for M-Bond 610).

CHARACTERISTICS

Operating Temperature Range:

Short Term: -452° to +700°F [-269° to +370°C].

Long Term: -452° to +500°F [-269° to +260°C].

Elongation Capabilities:

1% at -452°F [-269°C];

3% at +75°F [+24°C];

3% at +500°F [+260°C].

Shelf Life:

Minimum 3 months at +75°F [+24°C]; or 9 months at +40°F [+5°C].

Pot Life:

2 weeks at +75°F [+24°C]; 4 weeks at +40°F [+5°C].

Clamping Pressure:

10 to 70psi [70 to 480kN/m²].

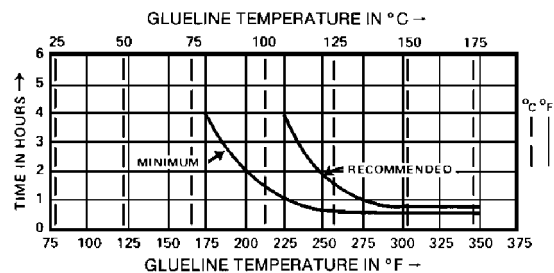
30 to 40psi optimum [200 to 275kN/m²].

Cure Requirements:

Moderately Elevated-Temperature Cure Required.

Recommended Postcure:

1 to 2 hours at 50°F [30°C] above maximum operating temperature.



PACKAGING

Kit:

4 bottles [11g ea] Curing Agent

4 bottles [8g ea] Resin

4 brush caps for dispensing mixed adhesive

4 disposable mixing funnels

Single Mix Kit:

1 bottle [11g ea] Curing Agent

1 bottle [8g ea] Resin

1 brush cap for dispensing mixed adhesive

1 disposable mixing funnel

References:

Instruction Bulletin B-130, "Strain Gage Installations with M-Bond 43-B, 600 and 610 Adhesive Systems" included in each kit.

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Strain Gage Adhesive



OTHER ACCESSORIES USED IN AN M-BOND 43-B INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- GSP-1 Gauze Sponges
- CSP-1 Cotton Applicators
- MJG-2 Mylar® Tape
- TFE-1 Teflon® Film
- HSC Spring Clamp
- GT-14 Pressure Pads and Backup Plates



RoHS
COMPLIANT

DESCRIPTION

Single-component, solvent-thinned, epoxy adhesive normally used in transducer applications; solids content 25%. May be used both as an adhesive and as a protective

coating. Capable of forming very thin, hard, void-free gluelines similar to M-Bond 610. Highly resistant to moisture and chemical attack.

CHARACTERISTICS

Operating Temperature Range:

Short Term: -452° to +350°F [-269° to +175°C].

Long Term: -452° to +300°F [-269° to +150°C].

Transducers: to +250°F [+120°C].

Elongation Capabilities:

1% at -452°F [-269°C];

4% at +75°F [+24°C];

2% at +300°F [+150°C].

Shelf Life:

Minimum 9 months at +75°F [+24°C]; or 18 months at +40°F [+5°C].

Pot Life:

Minimum 9 months at +75°F [+24°C]; or 18 months at +40°F [+5°C].

Clamping Pressure:

15 to 100psi [100 to 700kN/m²].

40 to 50psi [275 to 350kN/m²] optimum.

Cure Requirements:

Recommended: 2 hours at +375°F [+190°C], or as an alternate cure for aluminum alloy transducers, 2 1/2 hours at +300°F [+150°C]

Recommended Transducer Postcure: 2 hours at +400°F [+205°C], or as an alternate postcure for aluminum alloy transducers 2 1/2 hours at +350°F [+175°C].

PACKAGING

Kit:

4 brush-cap bottles [30ml ea] premixed adhesive

Single Bottle:

1 brush cap bottle [30ml] premixed adhesive

References:

Instruction Bulletin B-130, "Strain Gage Installations with M-Bond 43-B, 600 and 610 Adhesive Systems", included in each kit.

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Strain Gage Adhesive



OTHER ACCESSORIES USED IN AN M-BOND GA-61 INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- GSP-1 Gauze Sponges
- CSP-1 Cotton Applicators
- MJG-2 Mylar® Tape
- TFE-1 Teflon® Film
- HSC Spring Clamp
- GT-14 Pressure Pads and Backup Plates



RoHS
COMPLIANT

DESCRIPTION

Two-component, partially filled, 100%-solids epoxy adhesive for general-purpose stress analysis. Very high viscosity. Widely used to fill irregular surfaces and to anchor leadwires.

Forms a very hard, chemical-resistant material when fully cured. Glueline thickness is generally <0.002 in [0.05mm].

CHARACTERISTICS

Operating Temperature Range:

Short Term: -100° to +600°F [-75° to +315°C].

Long Term: -100° to +500°F [-75° to +260°C].

Elongation Capabilities:

1% at -100°F [-75°C];

2% at +75°F [+24°C];

1% at +500°F [+260°C].

Shelf Life:

6 months minimum at +75°F [+24°C]; refrigeration recommended.

Pot Life:

10 hours at +75°F [+24°C]; increased by refrigeration, indefinite by freezing.

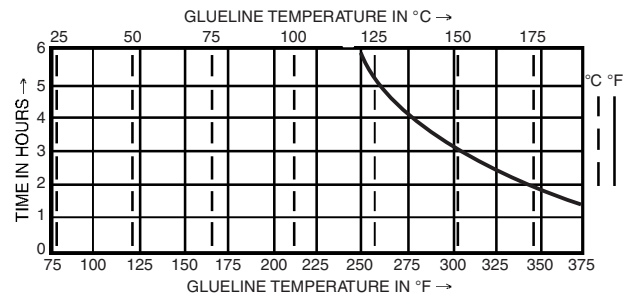
Clamping Pressure:

10 to 30psi [70 to 200kN/m²].

Cure Requirements:

Elevated-Temperature Cure Required.

Recommended Postcure: 1 hour at 50°F [30°C] above maximum operating temperature not to exceed +600°F [+315°C].



PACKAGING

Kit:

3 jars [10g ea] Resin

3 jars [5g ea] Hardener

3 stirring rods

References: Instruction Bulletin B-128, "Strain Gage Applications with M-Bond GA-61 Adhesive", included in each kit.

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Strain Gage Adhesive



OTHER ACCESSORIES USED IN AN M-BOND GA-2 INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- GSP-1 Gauze Sponges
- CSP-1 Cotton Applicators
- PCT-2M Gage Installation Tape
- HSC Spring Clamp
- GT-14 Pressure Pads and Backup Plates



RoHS
COMPLIANT

DESCRIPTION

Two-component, partially filled, 100%-solids epoxy system for general-purpose stress analysis. Higher viscosity than AE systems. Elevated-temperature cure recommended for best

performance and resistance to chemical attack. Often used to fill irregular surfaces. Uneven gluelines easily detectable by nonuniformity of bond color.

CHARACTERISTICS

Operating Temperature Range:

Long Term: -320° to +200°F [-195° to +95°C].

Elongation Capabilities:

4% at -320°F [-195°C].
10% to 15% at +75°F [+24°C] after 40-hour RT cure or 6-hour RT cure with postcure.

Shelf Life:

Minimum 12 months at +75°F [+24°C]; or 18 months at +40°F [+5°C].

Pot Life:

15 minutes at +75°F [+24°C]. Can be extended by cooling jar or by spreading adhesive on clean aluminum plate.

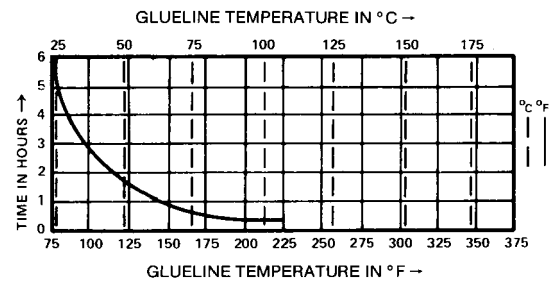
Clamping Pressure:

5 to 20psi [35 to 140kN/m²]. The black filler provides a visual indication of nonuniform bond areas caused by uneven clamping pressure.

Cure Requirements:

Preferred Room-Temperature Cure: 40 hours at +75°F [+24°C].

Recommended Postcure: 2 hours at 25°F [15°C] above maximum operating temperature.



PACKAGING

Kit:

- 6 mixing jars [15g ea] Resin
- 6 calibrated pipettes
- 1 bottle [15ml] Curing Agent 10-A
- 6 stirring rods

References: Instruction Bulletin B-137, "Strain Gage Applications with M-Bond AE-10, AE-15, and GA-2 Adhesive Systems," included in each kit.

Strain Gage Adhesive



OTHER ACCESSORIES USED IN AN M-BOND A-12 INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- GSP-1 Gauze Sponges
- CSP-1 Cotton Applicators
- PCT-2M Gage Installation Tape
- HSC Spring Clamp
- GT-14 Pressure Pads and Backup Plates



RoHS
COMPLIANT

DESCRIPTION

Two-component, 100%-solids epoxy system. Not intended as a general-purpose strain gage adhesive. Should be used only when maximum elongation requirements of a test

exceed the capabilities of other M-Bond adhesive systems. Mixed adhesive gritty with large solid particles present; large particles must be removed prior to gage installation.

CHARACTERISTICS

Operating Temperature Range:

Long Term: -50° to +180°F [-45° to +80°C].

Elongation Capabilities:

15% to 20% at +75°F [+24°C].

Shelf Life:

Minimum 1 year at +75°F [+24°C].

Pot Life:

Approximately 1 hour.

Clamping Pressure:

5 to 20psi [35 to 140kN/m²].

Cure Requirements:

2 hours at +165°F [+75°C] or 2 weeks at +75°F [+24°C].

PACKAGING

Kit:

- 1 tube each Part A and Part B
- 5 disposable mixing cups
- 5 wooden stirring sticks

References: Application instructions for M-Bond A-12 are included in each kit.

Strain Gage Adhesive



OTHER ACCESSORIES USED IN AN M-BOND 300 INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- GSP-1 Gauze Sponges
- CSP-1 Cotton Applicators
- PCT-2M Gage Installation Tape
- HSC Spring Clamp
- GT-14 Pressure Pads and Backup Plates



RoHS
COMPLIANT

DESCRIPTION

Special-purpose, two-component polyester adhesive. Not recommended as a general-purpose strain gage adhesive, but useful when a low-temperature-curing adhesive is required. While possessing the high shear strength required

of a strain gage adhesive, peel strength and solvent sensitivity are relatively poor. Should not be used for impact strain measurements, or with solvent-thinned protective coatings.

CHARACTERISTICS

Operating Temperature Range:

Long Term: -40° to +300°F [-40° to +150°C].

Elongation Capabilities:

1% to 2% at +75°F [+24°C].

Shelf Life:

Minimum 4 months at +75°F [+24°C].

Pot Life:

15 to 20 minutes at +40°F [+5°C]; 5 to 8 minutes at +75°F [+24°C].

Clamping Pressure:

5 to 20psi [35 to 140kN/m²].

Cure Requirements:

24 hours at +40°F [+5°C];
18 hours at +60°F [+15°C];
12 hours at +75°F [+24°C].

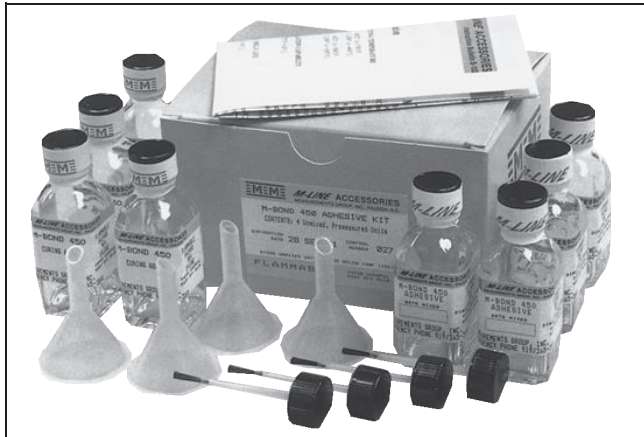
PACKAGING

Kit:

- 6 mixing jars [10g ea] Resin
- 6 calibrated pipettes
- 1 bottle [6g] Catalyst
- 6 stirring rods

References: Instruction Bulletin B-133, "Strain Gage Installations with M-Bond 300 Adhesive", included in each kit.

Strain Gage Adhesive



OTHER ACCESSORIES USED IN AN M-BOND 450 INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- GSP-1 Gauze Sponges
- CSP-1 Cotton Applicators
- MJG-2 Mylar® Tape
- TFE-1 Teflon® Film
- HSC Spring Clamp
- GT-14 Pressure Pads and Backup Plates



RoHS
COMPLIANT

DESCRIPTION

High-performance, two-component, solvent-thinned epoxy system specially formulated for high accuracy, elevated-temperature transducer applications.

CHARACTERISTICS

Operating Temperature Range:

Short Term: -452° to +750°F [-269° to +400°C].

Long Term: -452° to +500°F [-269° to +260°C].

Elongation Capabilities:

>5% at +75°F [+24°C].

Shelf Life:

Minimum 6 months at +75°F [+24°C].

Pot Life:

6 weeks at +75°F [+24°C].

Clamping Pressure:

60 to 100psi [415 to 690kN/m²].

Cure Requirements:

Step 1: Air dry at +75°F [+24°C] 10 to 30 minutes.

B-Stage: +225°F [+105°C] for 30 minutes.

Cure: +350°F [+175°C] for 1 hour.

Recommended Postcure: 1 hour at 50°F [30°C] above maximum operating temperature in 50°F [30°C] increments from +350°F [+175°C], dwelling 1 hour at each step.

PACKAGING

Kit:

4 bottles [12.5g ea] Curing Agent

4 bottles [12.5g ea] Resin

4 brush caps for applying adhesive

4 disposable mixing funnels

References: Instruction Bulletin B-152, "Instructions for the Application of Micro-Measurements M-Bond 450 Adhesive", included in each kit.

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Strain Gage Adhesive



OTHER ACCESSORIES USED IN A DENEX #3 INSTALLATION:

- CSM-1 Degreaser or GC-6 Isopropyl Alcohol
- Silicon Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- MJG-2 Mylar® Tape
- TFE-1 Teflon® Film
- HSC Spring Clamp
- GT-14 Pressure Pads and Backup Plates



RoHS
COMPLIANT

DESCRIPTION

Single-component, solvent thinned epoxy adhesive used in laboratory and transducer applications where negligible creep can be tolerated. Can be solvent thinned (acetone) for

easy application. Lower creep at elevated temperatures. Can be B-staged or dried prior to clamped curing.

CHARACTERISTICS

Operating Temperature Range:

−452° to +400°F [−269° to +204°C].

Elongation Capability:

1% at +75°F [+24°C].

Shelf Life:

Minimum 1 year at +75°F [+24°C].

Pot Life:

Minimum 1 year at +75°F [+24°C].

Clamping Pressure:

30-50psi [200 to 350kN/m²].

Cure Requirements:

Laboratory Use: 1 hour at +250°F [+120°C], followed by 1 hr at +350°F [+175°C].

Transducers: 4 hours at +325°F [+160°C].

Postcure (Unclamped):

Laboratory Use: 1 hour at 75°F [40°C] above maximum operating temperature.

Transducers: 4 hours at +350°F [+175°C].

PACKAGING OPTIONS

Kit:

- 1 brush cap bottle [1oz/30ml] of premixed adhesive.
- 4 brush cap bottles [1oz/30ml each] premixed adhesive.
- 1 bottle [32oz/950ml] premixed adhesive.

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Strain Gage Adhesive



OTHER ACCESSORIES USED IN AN EPOXYLITE 813 INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- GSP-1 Gauze Sponges
- MJG-2 Mykar® Tape
- TFE-1 Teflon® Film
- HSC Spring Clamp
- GT-14 Pressure Pads and Backup Plates



RoHS
COMPLIANT

DESCRIPTION

Two-part, 100%-solids, epoxy adhesive. Similar to GA-61, but serviceable to +600°F [+315°C]. Excellent adhesion to metals, ceramics, and most composites.

CHARACTERISTICS

Operating Temperature Range:

-320° to +600°F [-195° to +315°C].

Elongation Capabilities:

1% at +75°F [+24°C].

Shelf Life:

Minimum 6 months at +75°F [+24°C].

Pot Life:

6-8 hours at +75°F [+24°C].

Clamping Pressure:

30 to 70psi [200 to 350kN/m²].

Cure Requirements:

4 hours at +350°F [+175°C].

Recommended Postcure (Unclamped):

1 hour at 25°F (15°C) above maximum operating temperature.

PACKAGING OPTIONS

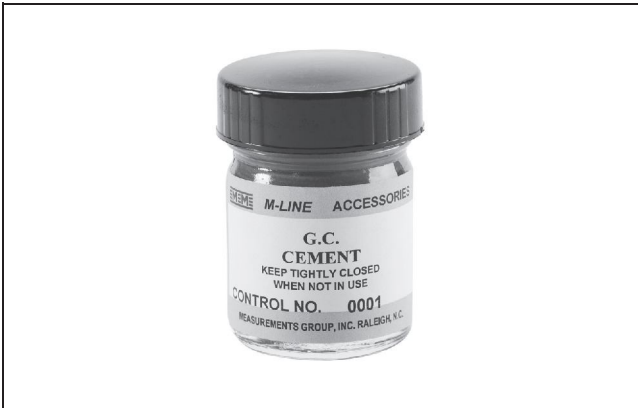
Kits:

6 bottles Part A [0.5oz/18gm] Resin.

6 bottles Part B [0.25oz/7gm] Powder.

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Strain Gage Cement



OTHER ACCESSORIES USED IN A GC CEMENT INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- GSP-1 Gauze Sponges
- GT-11 Camel's Hair Brush
- SPT-1 Double Blade Spatula



RoHS
 COMPLIANT

DESCRIPTION

Single-part ceramic cement for bonding free-filament strain gages (wire and foil). Recommended for installations on low-TCE materials such as carbon.

CHARACTERISTICS

Operating Temperature Range:

-320° to +2000°F [-195° to +1093°C].

Elongation Capabilities:

0.5% at +75°F [+24°C].

Shelf Life:

Minimum 1 year at +75°F [+24°C].

Pot Life:

1 year at +75°F [+24°C].

Temperature Coefficient of Expansion:

1.5ppm/°F [2.7ppm/°C].

Cure Requirements:

Precoat: Air-dry 30 minutes at +75°F [+24°C], then 30 minutes at +200°F [+95°C] followed by 30 minutes at +300°F [+150°C].

Final Coat: Air-dry 30 minutes at +75°F [+24°C], then 30 minutes at +200°F [+95°C] followed by 30 minutes at +300°F [+150°C], and final 1 hour at +600°F [+315°C].

PACKAGING OPTIONS

Kits:

1 bottle [1oz/30ml] premixed.

Strain Gage Cement



OTHER ACCESSORIES USED IN AN H CEMENT INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- GSP-1 Gauze Sponges
- GT-11 Camel's Hair Brush
- SPT-1 Double Blade Spatula
- H Cement Thinner

DESCRIPTION

Single-part ceramic cement/coating. Excellent electrical-insulation properties, even at +1600°F [+870°C]. Good adhesion to most metals.

CHARACTERISTICS

Operating Temperature Range:

-452° to +1600°F [-269° to +870°C].

Elongation Capabilities:

0.5% at +75°F [+24°C].

Shelf Life:

Minimum 1 year at +75°F [+24°C].

Pot Life:

Minimum 1 year at +75°F [+24°C].

Temperature Coefficient of Expansion

7.0ppm/°F [13ppm/°C].

Cure Requirements:**Precoat:**

Air-dry 30 minutes at +75°F [+24°C], then 30 minutes at +200°F [95°C] followed by 30 minutes at 350°F [177°C].

Final Coat:

Air-dry 30 minutes at +75°F [+24°C], then 30 minutes at +200°F [95°C] followed by 30 minutes at 350°F [177°C], and final 1 hour at +600°F [+315°C].

PACKAGING OPTIONS

Kits:

1 bottle [1oz/30ml] Cement

H Cement Kit A: 2 bottles [1oz/30ml] Cement

1 bottle [0.5oz/15ml] Thinner

1 bottle [2oz/60ml] Conditioner A

1 bottle [2oz/60ml] Neutralizer 5A

1 package 100-count CSP-1 Cotton Swabs

1 package 200-count GSP-1 Gauze Sponges

12 sheets [2in x 4.5in/50mm x 115mm] of 400-grit Silicon-Carbide Paper

H Cement Kit B: Same as H Cement Kit A except 6 bottles [1oz/30ml] Cement

Strain Gage Adhesive



OTHER ACCESSORIES USED IN A P ADHESIVE INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- CSP-1 Cotton Swabs
- GSP-1 Gauze Sponges
- MJG-2 Mylar® Tape
- TFE-1 Teflon® Film
- HSC Spring Clamp
- GT-14 Pressure Pads and Backup Plates



RoHS
COMPLIANT

DESCRIPTION

Single-part, solvent-thinned, polyimide adhesive. Results in a strong, thin, near-creep-free, adhesive layer.

CHARACTERISTICS

Operating Temperature Range:

−452° to +700°F [−270° to +370°C].

Upper limit:

+800°F [+425°C] for 1 to 2 hours.

Elongation Capabilities:

±2% at +75°F [+24°C].

Shelf Life:

Minimum 4 months at +75°F [+24°C].

Pot Life:

Minimum 4 months at +75°F [+24°C].

Clamping Pressure:

20 to 40psi [140 to 280kN/m²].

Cure Requirements:

For two minutes, expose the adhesive on the strain gage and test article to an infrared lamp or other heat source until the materials are dry. Monitor the temperature of the surface and do not allow materials to exceed +250°F [+120°C].

After clamping, cure 2 hours at +250°F [+120°C], increase temperature to +300°F [+150°C] for 2 hours, increase temperature to +340°F [+170°C] for 2 hours and finish cure with 4 hours at +380°F [+195°C].

Recommended Postcure (Unclamped):

1 hour at +300°F [+150°C], followed by 2 hours at +400°F [+205°C], and then 4 hours at +500°F [+260°C].

PACKAGING OPTIONS

Kits:

1 brush-cap bottle [1oz/30ml]

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Strain Gage Cement



OTHER ACCESSORIES USED IN A PBX CEMENT INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- GSP-1 Gauze Sponges
- GT-11 Camel's Hair Brush
- SPT-1 Double Blade Spatula

DESCRIPTION

Two-part ceramic cement/coating with excellent electrical insulating properties up to +1200°F [+650°C]. Recommended as a high-temperature cement and coating

for free-filament strain gages (wire and foil) and thermocouple applications. Provides good adhesion to most metals.

CHARACTERISTICS

Operating Temperature Range:

-452° to +1200°F [-269° to +650°C].

Elongation Capabilities:

0.5% at +75°F [+24°C].

Shelf Life:

Minimum 1 year at +75°F [+24°C].

Pot Life:

Minimum 1 year at +75°F [+24°C].

Temperature Coefficient of Expansion:

7.0ppm/°F [13ppm/°C].

Cure Requirements:

Precoat: Air-dry 30 minutes at +75°F [+24°C], then 30 minutes at +200°F [95°C] followed by 30 minutes at +300°F [150°C].

Final Coat: Air-dry 30 minutes at +75°F [+24°C], then 30 minutes at +200°F [+95°C] followed by 30 minutes at +300°F [+150°C], and final 1 hour at +600°F [+315°C].

PACKAGING OPTIONS

Kits:

1 jar powder [1lb/454gm]

1 bottle solvent [9oz/279ml]

Strain Gage Cement



OTHER ACCESSORIES USED IN A SAUEREISEN DKS-8 INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- CSP-1 Cotton Swabs
- GSP-1 Gauze Sponges
- GT-11 Camel's Hair Brush
- SPT-1 Double Blade Spatula



RoHS
 COMPLIANT

DESCRIPTION

Single-part chemical-setting, inorganic, Zircon-based cement supplied as a powder and mixed with water. High electrical-insulation and thermal-conductivity values. Used for installing high-temperature free-filament strain gages.

CHARACTERISTICS

Operating Temperature Range:

−452° to +2500°F [−269° to +1370°C].

Elongation Capabilities:

0.5% at +75°F [+24°C].

Shelf Life:

Minimum 1 year at +75°F [+24°C].

Pot Life:

Minimum 1 year at +75°F [+24°C].

Temperature Coefficient of Expansion:

2.6ppm/°F [4.7ppm/°C].

Cure Requirements:

18 to 24 hours at +75°F [+24°C]. Application of heat will accelerate cure time.

Recommended Postcure (Unclamped):

1 hour at 50°F [30°C] above maximum operating temperature.

PACKAGING OPTIONS

Kits:

1 bottle [4oz/115gm] powder

Strain Gage Adhesive



OTHER ACCESSORIES USED IN AN RTC EPOXY INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- CSP-1 Cotton Swabs
- GSP-1 Gauze Sponges
- MJG-2 Mylar® Tape
- TFE-1 Teflon® Film
- HSC Spring Clamp
- GT-14 Pressure Pads and Backup Plates



RoHS
COMPLIANT

DESCRIPTION

General-purpose, two-component, adhesive for lab and field applications with post-yield, high-elongation strain gages. Also excellent for cryogenic strain measurement applications.

CHARACTERISTICS

Operating Temperature Range:

−452° to +200°F [−269°C to +95°C].

Elongation Capabilities:

±15% at +75°F [+24°C].

Shelf Life:

Minimum 1 year at +75°F [+24°C].

Pot Life:

30 minutes at +75°F [+24°C].

Clamping Pressure:

5 to 20psi [35 to 140kN/m²].

Cure Requirements:

6 hours at +75°F [+24°C] or 1 hour at +175°F [+80°C].

Recommended Postcure (Unclamped):

1 hour at +120°F [+50°C] or 25°F [15°C] above maximum operating temperature.

PACKAGING OPTIONS

Kits:

1 jar Part A [2oz/56gm]

1 jar Part B [1oz/28gm]

1 jar Part A [11oz/308gm]

1 jar Part B [5oz/140gm]

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Strain Gage Adhesive



OTHER ACCESSORIES USED IN AN EPY-500 INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- GSP-1 Gauze Sponges
- CSP-1 Cotton Applicators
- MJG-2 Mylar® Tape
- TFE-1 Teflon® Film
- HSC Spring Clamp
- GT-14 Pressure Pads and Backup Plates



RoHS
 COMPLIANT

DESCRIPTION

EPY-500 is a two-part, heat-curing, filled epoxy system that is specially formulated for Micro-Measurements. This adhesive has reduced particle size, allowing a much thinner

glueline. The adhesive is compatible with all phenolic, epoxy-phenolic and polyimide strain gages.

CHARACTERISTICS

Operating Temperature Range:

–425° to +500°F [–269° to +260°C].

Shelf Life:

Minimum 9 months

Pot Life:

24 hours

Strain Limit – Single Cycle:

5% at +75°F [+24°C]; 1% at –320°F [–195°C].

Clamping Pressure:

10 to 15psi [70 to 105kN/m²].

Cure Requirements:

26 hours at +200°F [+93°C]; or 4 hours at +250°F [+121°C]; or 1 hour at +350°F [+176°C]; or 1/2 hour at +400°F [+204°C].

Recommended Post Cure:

1 hour at +450°F [+232°C].

PACKAGING OPTIONS

Small Kit:

5 [10g ea] packages

Large Kit:

2 [50g ea] packages

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Strain Gage Adhesive



OTHER ACCESSORIES USED IN A QA-500 INSTALLATION:

- CSM Degreaser or GC-6 Isopropyl Alcohol
- Silicon-Carbide Paper
- M-Prep Conditioner A
- M-Prep Neutralizer 5A
- GSP-1 Gauze Sponges
- CSP-1 Cotton Applicators
- MJG-2 Mylar® Tape
- TFE-1 Teflon® Film
- HSC Spring Clamp
- GT-14 Pressure Pads and Backup Plates


RoHS
COMPLIANT

DESCRIPTION

QA-500 is a specially formulated two-component, clear liquid and powder adhesive for use with strain gages. QA-500 has excellent moisture and chemical resistance.

CHARACTERISTICS

Operating Temperature Range:

–320° to +500°F [–195° to +260°C].

Shelf Life:

Minimum 9 months

Pot Life:

24 hours

Strain Limit – Single Cycle:

2%

Clamping Pressure:

20 to 30psi [140 to 210kN/m²].

Cure Requirements:

2 hours at +250°F [+121°C] minimum.

Postcure:

(clamps removed) 4 hours at +50°F [+28°C] above maximum operating or curing temperature, whichever is higher.

PACKAGING

Kit:

- 3 jars [7g ea] resin
- 3 jars [3g ea] hardener
- 3 stirring rods

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