

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Note: It is usually misguided economy to attempt installing strain gages with outdated adhesive, or adhesive that has not been stored as recommended.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 highly resistant to moisture and most chemicals. Room-temperature curing.
M-BOND GA-2	Special-purpose adhesive primarily used on very rough and irregular surfaces. Room-temperature curing.
RTC-2 EPOXY	General-purpose, room-temperature curing adhesive for lab and field applications with high-elongation strain gages. Also excellent for strain measurement at cryogenic temperatures.
M-BOND A-12	Special-purpose, very high-elongation adhesive. Used only when other adhesives cannot meet elongation requirements. Elevated-temperature curing.
M-BOND AE-15	Similar to AE-10. Recommended for more critical applications, including transducer gaging. Moderately elevated-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.
EPOXYLITE 813	Used for long term, high temperature applications requiring a filled glueline. Wider temperature range than GA-61.
EPY-500	Two-part, heat-curing, filled epoxy system with a wide temperature range.
QA-500	Two-component, clear liquid and powder adhesive for use with strain gages. Has excellent moisture and chemical resistance.
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 450	Special-purpose, high-performance epoxy for higher-temperature transducer applications.
DENEX #3	One-part epoxy for lab and transducer work requiring minimal creep. Elevated temperature curing.
P	Single-part solvent thinned polyimide adhesive. Excellent for long-term high temperature applications.
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.
NCC-3	Ceramic cement for bonding free-filament strain gages. Has superior bond strength to super-alloy materials, stainless steel, and titanium. Not for use on mild steel.
WC-16	Ceramic cement for bonding free-filament strain gages to materials with low thermal expansion coefficients. Not for use on iron-based alloys.
HG-1	Ceramic cement for bonding free-filament strain gages to most metals. Thermal expansion coefficient closely matches that of steel.
GC	Single-part ceramic cement used for free-filament gages. Recommended for use on low TCE materials, such as carbon.
PBX	Two-part ceramic cement/coating used for free-filament strain gages. Good adhesion to most metals.
SAUERISEN DKS-8	Single-part chemical setting zircon-based cement used for free-filament strain gages. High electrical insulation and thermal conductivity.

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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)	C2A, L2A, W2A, CEA, EA	200 or AE-10 or AE-15 or RTC-2 Epoxy
		WA, SA, WK, SK	AE-15 or 610
	-50° to +400°F (-45° to +205°C)	WA, SA, WK, SK	AE-10 or 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 or RTC-2 Epoxy
		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 or 450 or P Adhesive or Denex #3
	-320° to +350°F (-195° to +175°C)	WK, SK, TK, J5K	610 or 450 or P Adhesive or Denex #3
HIGH TEMPERATURE GAGING	-452° to +700°F (-269° to +370°C)	WK, RK	P Adhesive
	-320° to +1600°F (-195° to +870°C)	ZC, ZWP, ZWN, ZWH	NCC-3 or WC-16 or HG-1 or GC or PBX or DKS-8

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