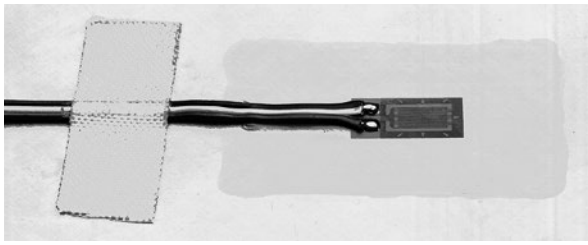
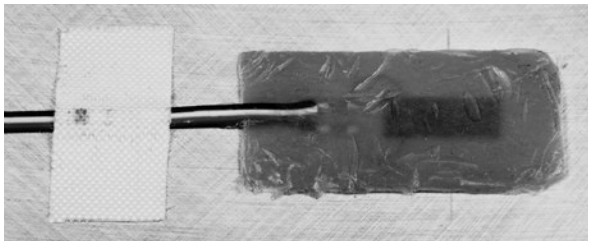
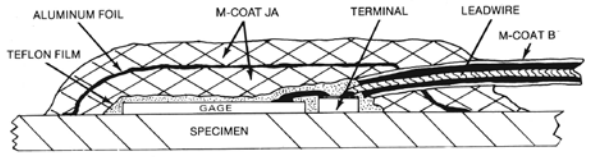
General Information



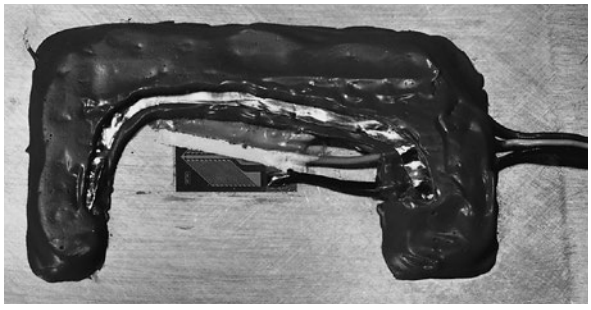
M-Coat A—General-purpose “transparent” polyurethane.



M-Coat W-1—Microcrystalline wax.



Cross-sectional view of typical long-term installation.



Recommended protective coating system for gage installations that must operate submerged in water for long periods of time.

Strain gage performance is easily degraded by the effects of moisture, chemical attack, or mechanical damage. As a result, gages require varying degrees of protection according to the severity of the environment in which they must operate. While it is often practical to operate fully encapsulated gages without additional protection, in laboratory applications, open-faced gages should always be covered with a suitable coating as soon as possible after installation.

The coating compounds described on the following pages have been formulated specifically for use in protecting strain gage installations from damaging environmental conditions. The range of materials is adequate for handling the majority of gage protection requirements. In an air-conditioned laboratory, for instance, a single layer of M-Coat A would ordinarily provide sufficient protection against moisture, fingerprints, and other contaminants. When the gage installation must operate in a more severe environment, alternate coatings or combinations of coatings can be employed as illustrated above.

To serve as a preliminary guide for coating selection, the chart on the next page gives recommended coating systems for a variety of typical environments. The effectiveness of these materials and procedures has been experimentally validated on numerous occasions. However, application technique is also an important factor in the performance of any gage protection system. It is therefore good practice, particularly in the case of long-term installations, to verify by test that the system performs as required.

APPLICATION NOTES FOR PROTECTIVE COATINGS

1. For long-term tests, or in particularly hostile environments, carefully clean the surface before applying any protective coating. Coating extending into uncleaned areas will eventually loosen.
2. When several layers of coating are required, extend each overcoat beyond the previous layer.
3. Incomplete protection around leadwires is a common cause of moisture penetration into gage installations. (Many commercial leadwire insulations contain pinholes.)
4. Seal wire splices with HST-1 Heat Shrinkable Tubing.
5. Before applying any protective coating to an unprotected installation that has been exposed to high humidity, dry the installation thoroughly.
6. If the coating is a room-temperature-curing type, the moisture absorption rate can be decreased by postcuring at an elevated temperature.
7. Generally, a thick coating offers a more resistant path to moisture absorption than a thin one.
8. For a further vapor barrier, apply an intermediate layer of metal foil (aluminum, such as M-Coat FA-2, or stainless steel), or TFE Teflon® film (first treated with TEC-1 Tetra-Etch® compound for optimum bond). Since moisture can only penetrate around the edges of the foil or film, the path to the gage is much longer
9. To evaluate protective coatings for long-term testing, monitor the zero-shift of the gage. Resistance-to-ground measurements can also indicate deterioration.

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Tetra-Etch is a Registered Trademark of W.L. Gore.

General Information

PLANNING FOR RELIABLE STRAIN GAGE INSTALLATIONS		
ENVIRONMENT	**PREFERRED**	**ALTERNATE**
TYPICAL LABORATORY		
50%, or lower, relative humidity	M-Coat A	M-Coat C, or M-Coat D, or M-Coat F
FIELD APPLICATIONS		
Outdoor installations, shielded from rain and snow	M-Coat F	M-Coat JA
HIGH HUMIDITY, WATER SPLASH		
Laboratory and field applications under damp or wet conditions	**Short Term:** 3140 RTV **Long Term:** M-Coat W-1 Wax	**Short Term:** 3145 RTV **Long Term:** M-Coat F
WATER IMMERSION		
Short-term, fresh water or salt water	Teflon® + M-Coat B (on vinyl-insulated leadwires) + M-Coat JA	M-Coat W-1 Wax
Long-term, fresh water	Per diagram and photo on previous page	M-Coat W-1 Wax, or M-Coat F
Long-term, salt water	Per diagram and photo on previous page + metal cap and conduit for leadwires	None
High-pressure water	Per diagram and photo on previous page	M-Coat F, or M-Coat W-1 Wax for short-term
STEAM		
+212°F (+100°C), long-term installation	Hermetically sealed metal cap, and conduit for leadwires	None
CONCRETE SURFACES		
Long-term	Per diagram and photo on previous page, preceded by M-Bond AE-10	M-Bond GA-61 to seal concrete surface
OILS AND GASOLINE		
Commercial oils, to +180°F (+80°C), gasoline, and kerosene	M-Coat D + two or three layers of M-Coat B	3145 RTV + M-Coat B
Synthetic oils, to +200°F (+95°C)	Two or three layers of M-Bond 43B	M-Bond GA-61
HIGH-TEMPERATURE AIR		
To +500°F (+260°C), with good mechanical protection	**Short Term:** M-Bond GA-61	3145 RTV