



# M-Bond 200 Installations

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<http://www.measurementsgroup.com>

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Also available in printed form as Measurements Group Instruction Bulletin B-127

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# M-Bond 200 Installations

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## Introduction

Micro-Measurements certified [M-Bond 200](#) is an excellent general-purpose laboratory adhesive because of its fast room-temperature cure and ease of application. When properly handled and used with the appropriate strain gage, M-Bond 200 can be used for high-elongation tests in excess of 60 000 microstrain, for fatigue studies, and for one-cycle proof tests to over +200° F (+95° C) or below -300° F (-185° C).



*M-Bond 200 Kit*

The normal operating temperature range is -25° to +150° F (-30° to +65° C). M-Bond 200 is compatible with all Micro-Measurements strain gages and most common structural materials. When bonding to plastics, it should be noted that for best performance the adhesive flowout should be kept to a minimum. For best reliability, it should be applied to surfaces between the temperatures of +70° and +85° F (+20° to +30° C), and in a relative humidity environment of 30% to 65%.

M-Bond 200 catalyst has been specially formulated to control the reactivity rate of this adhesive. The catalyst should be used sparingly for best results. Excessive catalyst can contribute many problems; e.g., poor bond strength, age-embrittlement of the adhesive, poor glueline thickness control, extended solvent evaporation time requirements, etc.

Since M-Bond 200 bonds are weakened by exposure to high humidity, adequate protective coatings are essential. This adhesive will gradually become harder and more brittle with time, particularly if exposed to elevated temperatures. For these reasons, M-Bond 200 is not generally recommended for installations exceeding one

or two years.



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# M-Bond 200 Installations

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## Installation Accessories

For proper results, the procedures and techniques presented in this bulletin should be used with qualified [Micro-Measurements installation accessory products](#).

*M-LINE* accessories used in this procedure are:

- [CSM-1A 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-2A Cellophane Tape](#)

Various installation techniques are described on professionally prepared [videotapes](#) available from the Measurements Group.



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## Shelf Storage Life

Unopened M-Bond 200 adhesive has a shelf life of nine months when stored under normal laboratory conditions. Life can be extended if upon receipt the unopened material is refrigerated [+40 deg F (+5 deg C)]. Due to possible condensation problems which will degrade adhesive performance, care should be taken to ensure that the M-Bond 200 has returned to room-temperature equilibrium before opening. Refrigeration after opening is not recommended.

## Handling Precautions

*M-Bond 200 is a modified alkyl cyanoacrylate compound. Immediate bonding of eye, skin or mouth may result upon contact. Causes irritation. The user is cautioned to: (1) avoid contact with skin; (2) avoid prolonged or repeated breathing of vapors; and (3) use with adequate ventilation. For additional health and safety information, consult the Material Safety Data Sheet which is available upon request from the Measurements Group.*



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# M-Bond 200 Installations

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## Gage Installation Techniques

### Getting Started

The installation procedure presented here is somewhat abbreviated and is intended only as a guide in achieving proper gage installation with M-Bond 200.

Micro-Measurements [Instruction Bulletin B-129](#) presents recommended procedures for surface preparation, and lists specific considerations which are helpful when working with most common structural materials.

### Application of M-Bond 200 Adhesive



From [VideoTech Library](#) VS-101



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# M-Bond 200 Installations

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## Gage Installation Techniques

### Step 1 of 11

Thoroughly degrease the gaging area with solvent, such as [CSM-1A Degreaser](#) or [GC-6 Isopropyl Alcohol](#). The former is preferred, but there are some materials (e.g., titanium and many plastics) which react with chlorinated solvents. In these cases GC-6 Isopropyl Alcohol should be considered.



All degreasing should be done with uncontaminated solvents - thus the use of "one-way" containers, such as aerosol cans, is highly advisable.



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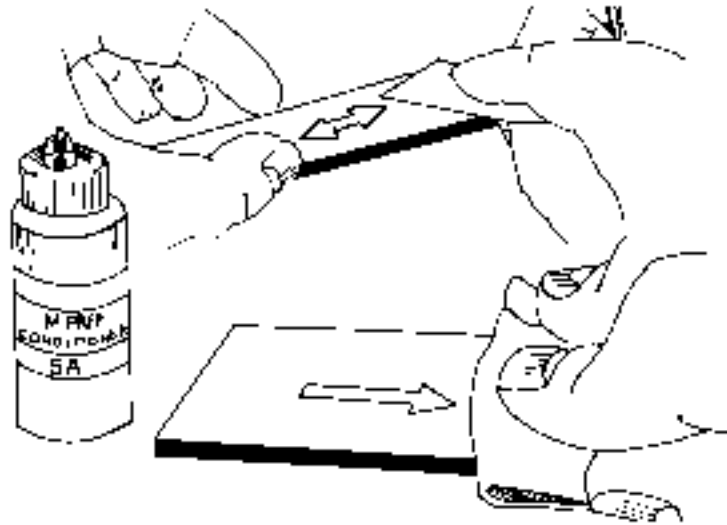
# M-Bond 200 Installations

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## Gage Installation Techniques

### Step 2 of 11

Preliminary dry abrading with 220- or 320-grit [silicon-carbide paper](#) is generally required if there is any surface scale or oxide. Final abrading is done by using 320- or 400-grit silicon-carbide paper on surfaces thoroughly wetted with [M-Prep Conditioner A](#). This is followed by wiping dry with a [gauze sponge](#). Repeat this wet abrading process, then dry by slowly wiping through with a gauze sponge.



With a [4H pencil](#) (on aluminum) or a ballpoint pen (on steel), burnish (do not scribe) whatever alignment marks are needed on the specimen. Repeatedly apply M-Prep Conditioner A and scrub with [cotton-tipped applicators](#) until a clean tip is no longer discolored. Remove all residue and Conditioner by again slowly wiping through with a gauze sponge. Never allow any solution to dry on the surface because this invariably leaves a contaminating film and reduces chances of a good bond.





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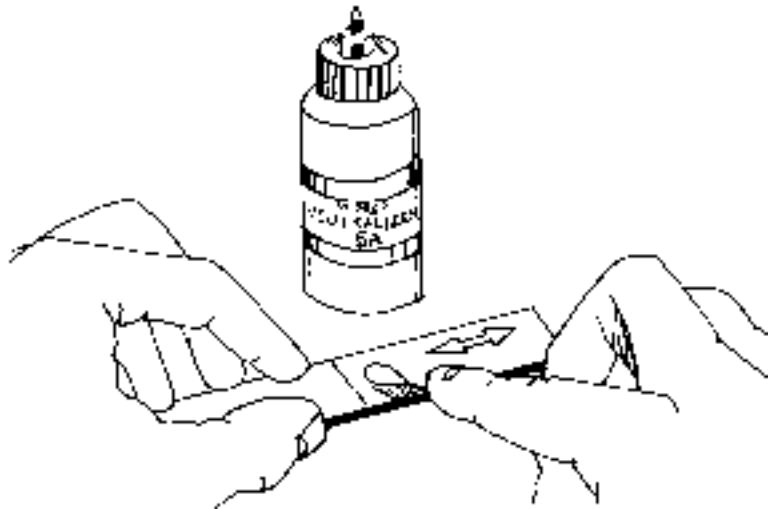
# M-Bond 200 Installations

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## Gage Installation Techniques

### Step 3 of 11

Now apply a liberal amount of [M-Prep Neutralizer 5A](#) and scrub with a [cotton-tipped applicator](#), as shown below.



With a single, slow wiping motion of a [gauze sponge](#), carefully dry this surface. Do not wipe back and forth because this may allow contaminants to be redeposited.



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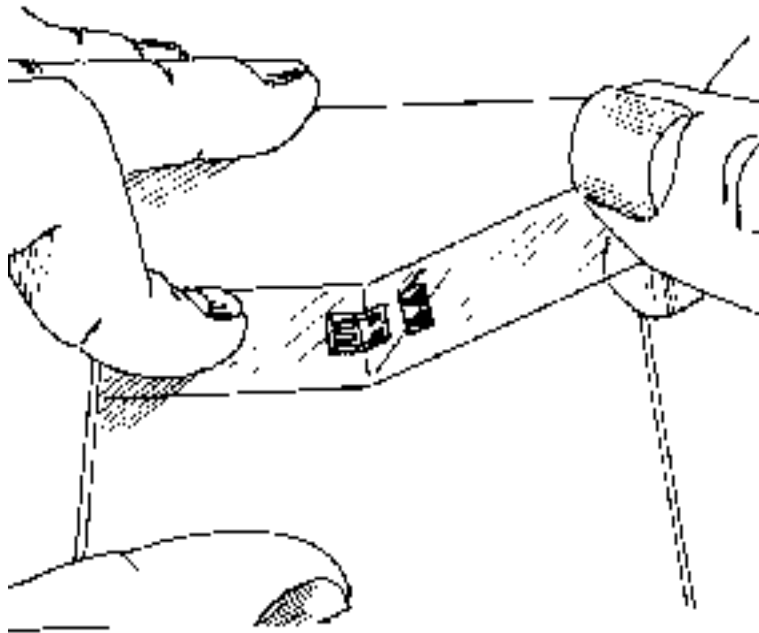
# M-Bond 200 Installations

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## Gage Installation Techniques

### Step 4 of 11

Using [tweezers](#) to remove the gage from the transparent envelope, place the gage (bonding side down) on a chemically clean glass plate or gage box surface. If a [solder terminal](#) is to be incorporated, position it on the plate adjacent to the gage as shown. A space of approximately 1/16 in (1.6 mm) should be left between the gage backing and terminal. Place a 4- to 6-in (100- to 150-mm) piece of Micro-Measurements [PCT-2A cellophane tape](#) over the gage and terminal. Take care to center the gage on the tape. Carefully lift the tape at a shallow angle (about 45 degrees to specimen surface), bringing the gage up with the tape as illustrated here.



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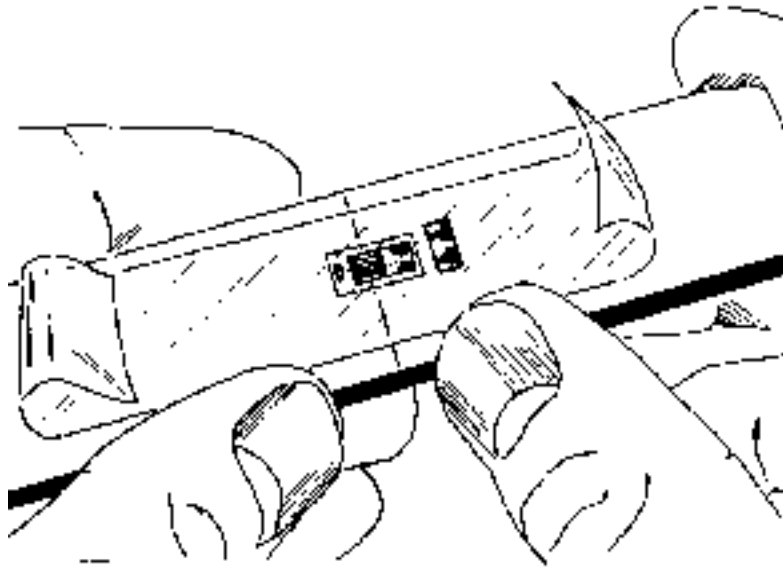
# M-Bond 200 Installations

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## Gage Installation Techniques

### Step 5 of 11

Position the gage/tape assembly so that the triangle alignment marks on the gage are over the layout lines on the specimen.



If the assembly appears to be misaligned, lift one end of the tape at a shallow angle until the assembly is free of the specimen. Realign properly, and firmly anchor down at least one end of the tape to the specimen. Realignment can be done without fear of contamination by the tape mastic if Micro-Measurements [PCT-2A cellophane tape](#) is used, because this tape will retain its mastic when removed.



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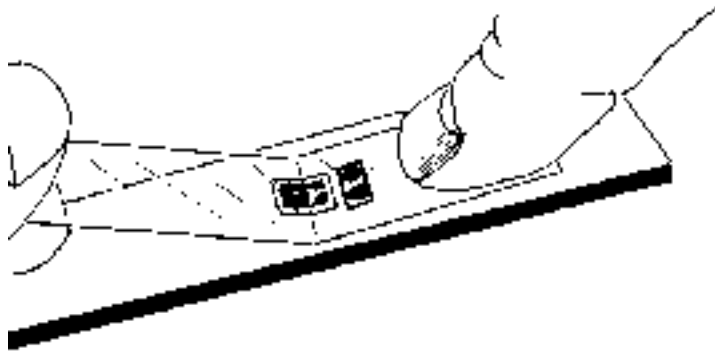
# M-Bond 200 Installations

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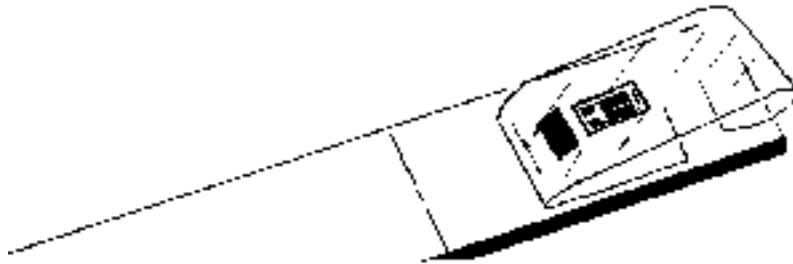
## Gage Installation Techniques

### Step 6 of 11

Lift the gage end of the tape assembly as shown here at a shallow angle to the specimen surface (about 45 degrees) until the gage and terminal are free of the specimen surface.



Continue lifting the tape until it is free from the specimen approximately 1/2 in (10 mm) beyond the terminal. Tuck the loose end of the tape under and press to the specimen surface (as shown below) so that the gage and terminal lie flat, with the bonding surface exposed.



Note: *Micro-Measurements gages have been treated for optimum bonding conditions and require no pre-cleaning before use unless contaminated during handling. If contaminated, the back of any gage can be cleaned with a [cotton-tipped applicator](#) slightly moistened with [M-Prep Neutralizer 5A](#).*



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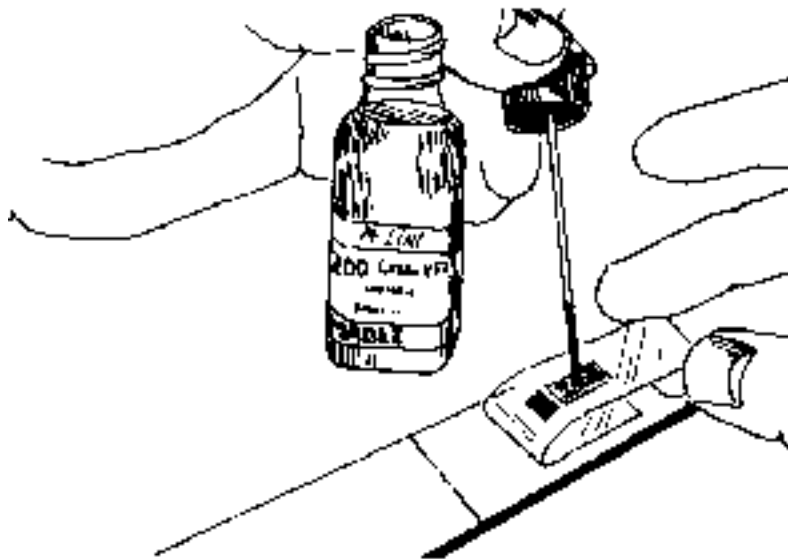
# M-Bond 200 Installations

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## Gage Installation Techniques

### Step 7 of 11

M-Bond 200 catalyst can now be applied to the bonding surface of the gage and terminal. M-Bond 200 adhesive will harden without the catalyst, but less quickly and reliably. Very little catalyst is needed and should be applied in a thin, uniform coat. Lift the brush-cap out of the catalyst bottle and wipe the brush approximately 10 strokes against the lip of the bottle to wring out most of the catalyst. Set the brush down on the gage and swab the gage backing.



Do not stroke the brush in a painting style, but slide the brush over the entire gage surface and then the terminal. Move the brush to the adjacent tape area prior to lifting from the surface. Allow the catalyst to dry at least one minute under normal ambient conditions of +75 deg F (+24 deg C) and 30% to 65% relative humidity before proceeding.



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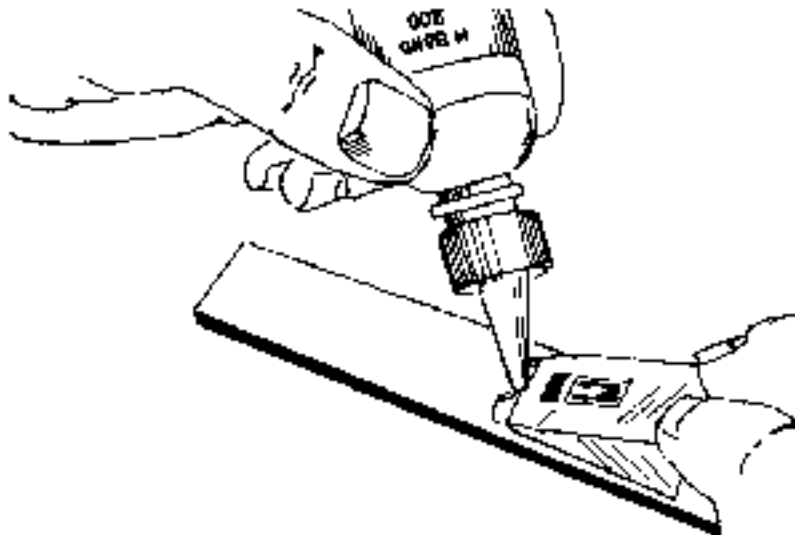
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## Gage Installation Techniques

**Note:** *The next three steps must be completed in the sequence shown, within 3 to 5 seconds. Read Steps 8, 9, and 10 before proceeding.*

### Step 8 of 11

Lift the tucked-under tape end of the assembly, and, holding in the same position, apply one or two drops of M-Bond 200 adhesive at the fold formed by the junction of the tape and specimen surface.



This adhesive application should be approximately 1/2 in (13 mm) outside the actual gage installation area. This will insure that local polymerization, taking place when the adhesive comes in contact with the specimen surface, will not cause unevenness in the gage glueline.



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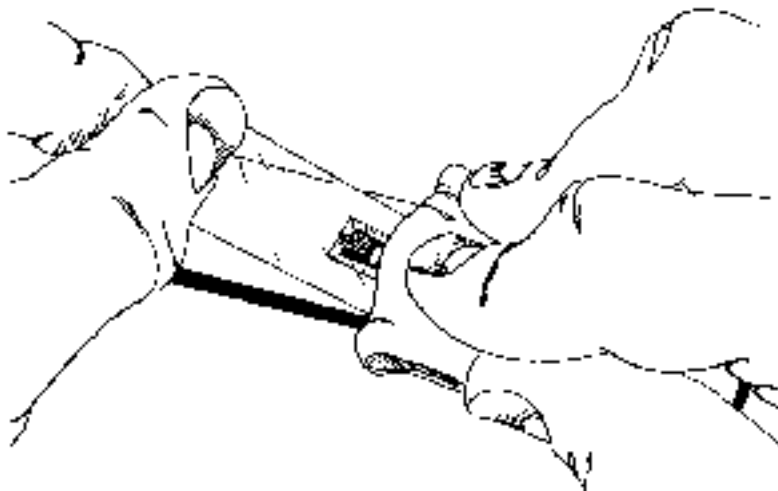
# M-Bond 200 Installations

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## Gage Installation Techniques

### Step 9 of 11

Immediately rotate the tape to approximately a 30-degree angle so that the gage is bridged over the installation area. While holding the tape slightly taut, slowly and firmly make a single wiping stroke over the gage/tape assembly with a piece of [gauze](#) ...



... bringing the gage back down over the alignment marks on the specimen. Use a firm pressure with your fingers when wiping over the gage. A very thin, uniform layer of adhesive is desired for optimum bond performance.



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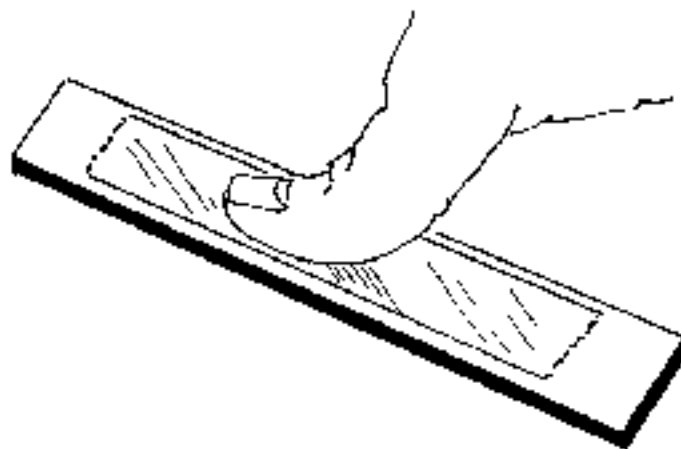
# M-Bond 200 Installations

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## Gage Installation Techniques

### Step 10 of 11

Immediately upon completion of wipe-out of the adhesive, firm thumb pressure must be applied to the gage and terminal area.



This pressure should be held for at least one minute. In low humidity conditions (below 30%) or if the ambient temperature is below +70 deg F (+20 deg C), this pressure application time may have to be extended to several minutes. Where large gages are involved, or where curved surfaces such as fillets are encountered, it may be advantageous to use preformed pressure padding during the operation. Pressure-application time should again be extended due to the lack of "thumb heat" which helps to speed adhesive polymerization. Wait two minutes before removing tape.





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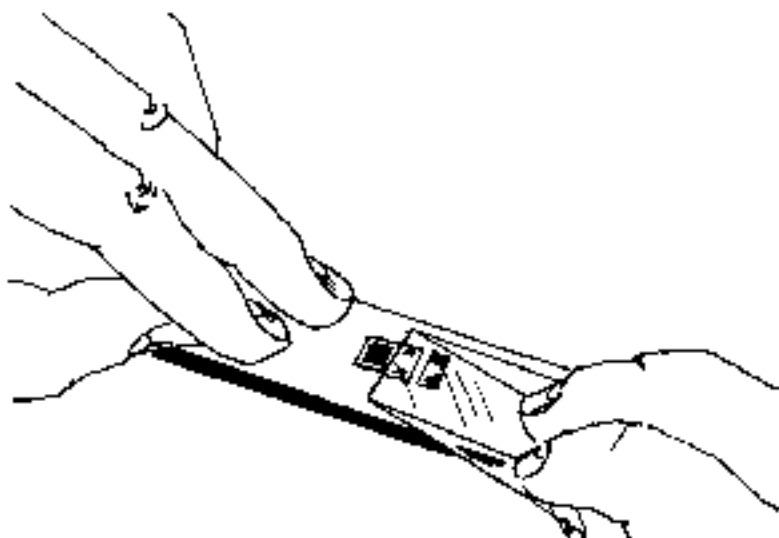
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## Gage Installation Techniques

### Step 11 of 11

The gage and terminal strip are now solidly bonded in place. To remove the tape, pull it back directly over itself, peeling it slowly and steadily off the surface.



This technique will prevent possible lifting of the foil on open-faced gages or other damage to the installation. It is not necessary to remove the tape immediately after gage installation. The tape will offer mechanical protection for the grid surface and may be left in place until it is removed for gage wiring.



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# M-Bond 200 Installations

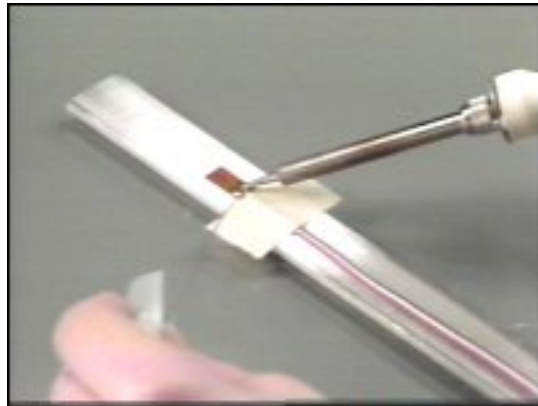
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## Gage Installation Techniques

### Final Inspection Procedure

1. Select appropriate [solder](#), referring to Micro-Measurements Catalog A-110, and attach leadwires. Prior to any soldering operations, open-faced gage grids should be masked with [PDT-1 drafting tape](#) to prevent possible damage.
2. Remove the solder flux with [M-LINE Rosin Solvent](#), RSK-1.
3. Select and apply protective coating according to the [protective coating selection chart](#) found in Catalog A-110.

#### Attaching Leadwires



From [VideoTech Library](#) VS-101

