

Instructions for ELECTRELEASE™ E4 and ELECTRELEASE™ M



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SUCCESSFUL USE OF THIS PRODUCT REQUIRES A THOROUGH UNDERSTANDING OF ITS FUNCTION. IF IN DOUBT ABOUT HOW TO USE ELECTRELEASE, CALL EIC LABORATORIES FOR APPLICATIONS SUPPORT. EIC LABORATORIES ASSUMES NO LIABILITY FOR DAMAGE OR LOSS FROM USE OF THIS PRODUCT

OVERVIEW OF IMPORTANT PROCEDURES:

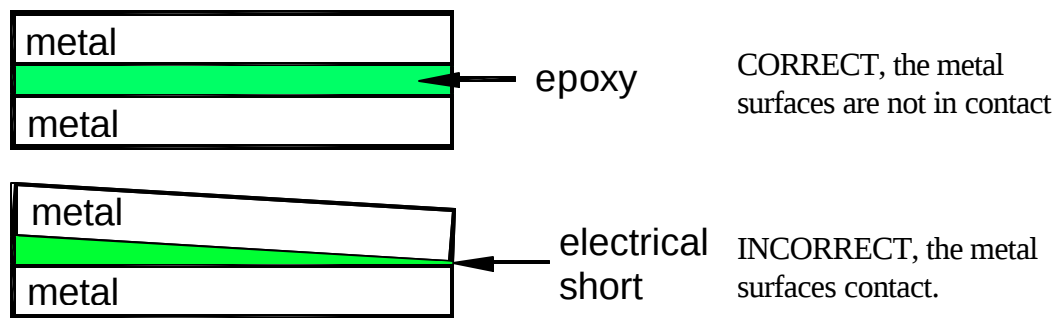
ELECTRELEASE™ electrically disbonding adhesives are similar to standard 2-part amine-cured epoxies, with four important exceptions.

1. The adhesive bond must incorporate two electrically isolated, electrically conductive elements. In the case of metallic substrates, these may be the substrates themselves. For non-conductive substrates, metal-foils or wire meshes may be placed in the bondline. At least one of these conductive elements must be continuous and span the entire area of the bond. It is at this interface that the electrical disbonding reactions occur. If the two conductive elements physically contact or otherwise electrically short, it will not be possible to electrochemically release the bond.
2. A small amount of ammonia gas is generated during mixing of the 2-part adhesive. It is important that the gas dissipate from the system prior to application (ca. 10 minutes). Failure to do so may reduce the strength of the cured epoxy. For this reason, the use of static mixers is not recommended.
3. While the adhesive can be cured at either ambient or elevated temperatures (24-48 hours at room temperature or 1 hour at 80°C), mixed temperature curing should not be used. Samples partially cured at room temperature (>1 hour) should not be finished at 80°C.
4. Gentle mixing should be used to blend the 2-part epoxy. Vigorous mixing will dissolve air into the mixture, resulting in the formation of a porous material with reduced bond strength.

TO FORM THE BOND:

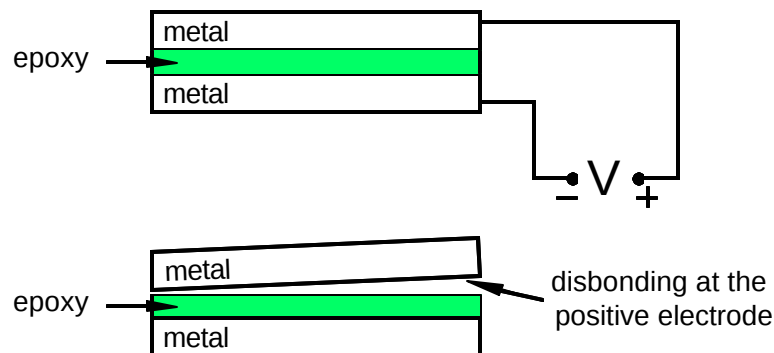
1. Substrates must be clean, dry and free of oil, grease, soap or detergent. Surfaces can be lightly roughened by sanding. Deep sanding is not necessary and may increase disbond times. For maximum bond strength, standard metal treatments such as acid-etch are recommended.
2. Depress the plunger into the double-barreled syringe to dispense required amount of two-part resin mixture. Depress both sides equally to dispense the correct mix ratio of 4:1. Initial material from freshly opened tube (1 or 2 drops) should be discarded.
3. Gently mix components until the mixture is uniform in appearance. A slight odor of ammonia will be apparent.
4. Allow the mixture to stand for about ten minutes before applying. Pot-life for **ELECTRELEASE E4** is about 40 minutes and slightly longer for **ELECTRELEASE M**.
5. Apply the mixed epoxy uniformly to one surface. Firmly press both surfaces together.
6. **ELECTRELEASE E4** cures in one hour at 80°C or in 24 hours at room temperature.
ELECTRELEASE M requires 2 hours at 80°C or 48 hours at room temperature to cure to full strength.

IMPORTANT: SUBSTRATES MUST BE ELECTRICALLY ISOLATED FROM EACH OTHER



TO DISBOND:

1. Connect the terminals of a voltage source to the metal substrates as shown below. A minimum of 10 V is required. **ELECTRELEASE E4** and **ELECTRELEASE M** disbond at the positive (anode) terminal.



2. The disbonding time depends on temperature, voltage, and the load on the bond. Typical values are 10 seconds at 45 V and 20 minutes at 15 V. Applying the voltage for longer times does no damage and the disbonding will be more complete.

WARNING: EXERCISE GREAT CAUTION WHEN DISBONDING HEAVY SUBSTRATES, SUPPORT STRUCTURES, AND PRESSURIZED OR SPRING-LOADED MECHANISMS. THE BOND CAN SEPARATE SUDDENLY. SEVERE INJURY OR DEATH CAN RESULT FROM FALLING OR FLYING OBJECTS.

3. To disbond at both interfaces, apply the disbonding voltage for the required length of time and then reverse the electrical connection and reapply the voltage for an equivalent length of time.
4. After the disbonding voltage has been applied for the requisite time, most substrates can be separated by hand. SEE WARNING ABOVE.
5. Large area substrates may require mechanical means to separate. If the bond area is greater than 10 square inches (65 square centimeters) we recommend contacting EIC Laboratories for technical support.
6. Residual **ELECTRELEASE M** on disbonded surfaces can be removed by swelling in methanol.