# EpoxyMount

Epoxy Mounting Resin

## Description

EpoxyMount is a clear, 2-hour, room temperature curing, cold mounting epoxy resin for potting/encapsulation of metallographic samples. It exhibits excellent adhesion, very low shrinkage, and low viscosity, allowing it to penetrate open pores and cavities to maximize edge retention and support.

**Mixing Ratio* (by WEIGHT)**
10:3 (Resin:Hardener)

**Mixed Viscosity**
350-500 cP

**Curing Schedule (Room Temperature) ***
2 hours/120 minutes
(1.25" diameter x 1" height)

**Pot Life**
25 minutes @ 100 g

**Peak Exothermic Curing Temperature ***
66 °C (150 °F)

**Durometer Hardness**
87D

**Chemical Properties**
Non-soluble in water (cured)
Soluble in Allied Epoxy Dissolver (#145-50210)

**Shrinkage**
0.00008%, Inch/Inch

**Izod Impact/Tensile Strength**
0.94/7600 psi

**Glass Transition Temperature**
140 °C (284 °F)

**Light Refractive Index**
1.519

* At optimum mixing ratio; larger volume mixtures cure at higher temperatures and more rapidly.

## Eliminating Bubbles & Air Pockets

To fill open pores and cavities and eliminate bubble formation, vacuum impregnation and/or a pressure chamber can be used. Open air pockets within a sample do not provide adequate support to the material at the interface and can collect debris during grinding and polishing. Debris will contaminate the polishing cloths, leaving scratches on the polished surface.

## WARNING!

GHS03 GHS05 GHS07 GHS08 GHS09

**Refer to the SDS document for additional safety information.**

## Instructions:

1) To improve mounting material adhesion and prevent outgassing, clean the sample using micro organic soap, isopropyl alcohol, and/or an ultrasonic cleaner. Air/heat dry to remove all moisture before mounting.
2) Weigh AND mix components in a SINGLE plastic cup (do not use wax lined or paper cups), using a scale with 0.1 g precision.
3) Mix thoroughly by scraping both the sides and bottom of the mixing cup for approximately 2-3 minutes, until the mixture appears homogenous.
4) Pour the mixture over the sample in the mounting cup.
5) If using a vacuum, place the cup into the chamber and vacuum for 3-5 minutes at 25-30 inHg. Release the vacuum slowly.
6) Let the mount harden/cure. For best results, cure the mount in a pressure chamber at 25-30 psi.

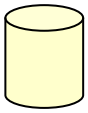
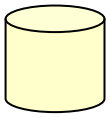
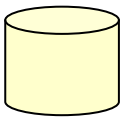
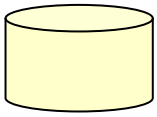
VacuPrep™

Pressure Chamber

**Add heat for 45-minute cure time:** After pouring the mixture over the sample, run a vacuum cycle (if desired), and then heat it on a hot plate or in an oven at 38 °C (100 °F) for 10-15 minutes. This is not recommended for heat sensitive specimens.

**Crystallization:** When stored in cool conditions, crystallization of the resin (Part A) may occur. To dissolve the crystals, loosen the cap and heat the bottle to 38 °C (100 °F) for 30 minutes. Allow it to cool to room temperature before using.

Rev: 4/2015

| Mount Size | Cure Time (Hours)* | Mixing Ratio | Max Temperature |
|---|---|---|---|
|  1"/25 mm | 2-3 | 10:3.5 | 120 °F (49 °C) |
|  1.25"/32 mm | 1.5-2 | 10:3 | 150 °F (65 °C) |
|  1.5"/38-40 mm | 1-1.5 | 10:3 | 150 °F (65 °C) |
|  2"/50 mm + | 1-2 | 10:2.5 | 150+ °F (71 °C) |

* Mixing ratio and room temperature will influence performance and the data in the table above. Room temperature of 77 °F (25 °C) will yield these numbers. If mixture of components by weight is not done precisely, these numbers will also vary.

Cure time can be accelerated by heating mixed & poured mount to 100 °F (38 °C) for 10-15 minutes. Placing molds into a shallow bath of water will reduce exothermic heat.

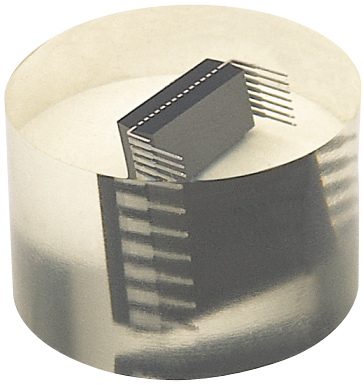
**Note:** The use of "disposable mounting cups" is not recommended unless they are cooled in water to avoid melting the cup itself.

# Notes About Encapsulating Samples in Epoxy

## Measuring
When measuring components of epoxy, be sure to do so by weight. If the ratio is off more than 0.5 grams, this will affect the curing characteristics, peak temperature, cure time and hardness. Be sure to measure both parts in the same cup.

## Mixing
When mixing the epoxy, be sure to use cups resistant to absorption. If using paper cups the hardener may absorb into the cup, which will affect the cure time and hardness. Also be sure the components are mixed thoroughly. Scrape the bottom and sides of the mixing cup well. The mixture will first appear cloudy, and then it will become clear, without striations.

## Curing
Epoxy cure times vary with mass. The larger the mass, the higher the exothermic temperature reached during curing and the faster the epoxy cures. Keep this in mind when mixing heat sensitive samples in larger mounting cups. Epoxies are normally cured at room temperature, defined as 77 degrees F. If the room is colder, the cure time and hardness will be affected. If heat is applied, the cure time will be accelerated.



## Vacuum/Removing Bubbles
Vacuum impregnation is used to remove entrapped air when encapsulating samples in epoxy. The vacuum pulls air from the mount, displacing it with epoxy, providing complete bonding and support. This maintains sample integrity during abrasive preparation, reducing the chances of cracking or delamination. The time required to remove all the air bubbles will depend on the vacuum capacity. When pulling vacuum, do not let the epoxy foam over the edge of the mounting cup, or the mount may not cure properly.

After the epoxy has been properly measured and mixed in a ****PLASTIC** mixing cup, place it into the vacuum chamber. Replace the cover and close the stopcock. Turn on the vacuum and allow it to run continuously for 3-5 minutes after the vacuum gauge reaches the range of 25 in. Hg (+/- 2). Once full vacuum is reached, turn the pump off. Slowly open the stopcock to release the vacuum. **Note:** Releasing vacuum too rapidly may cause air to penetrate the mount or the epoxy to splash out of the cup.

Remove the mixing cup from the chamber and carefully pour the epoxy into the mounting cup(s). Place mounting cup(s) into the chamber and apply vacuum, as described above. Care should be taken to ensure that samples maintain correct placement in mounting cup(s).

****Tip:** Plastic mixing cups reduce the chance of hardener loss and allow proper hardening of mounted specimens.

## Back-Filling
Some samples have areas where there is no way to get epoxy into the structure that needs support. Back-filling is a process where the sample is mounted, then ground to expose the air pocket. The entire sample is then remounted in epoxy and vacuum is used to pull the air from the pocket which is displaced with epoxy, providing support to the structure. When back-filling, be sure to use enough epoxy to fully cure and harden.

## Sample Removal
If a sample needs to be removed from the cured epoxy or epoxy that has not fully cured; it may be dissolved using Allied's **Epoxy Dissolver #145-50210**. The time required to dissolve the epoxy can be reduced if the excess is ground or cut prior.

When the correct resin system has been selected for the application, proper processing steps are required to ensure quality encapsulation of the sample. Improper processing may result in an embedment with cosmetic and functional defects. In the majority of cases, these problems can be remedied with relative ease. The table below identifies common types of defects, their probable cause, and effective techniques for overcoming them.

| | Probable Causes | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Common Embedment Defects** | Incorrect Mixing Ratio | Insufficient Mixing | Wrong Resin Choice | Resin Too Thick | Mass Too Large | Cure Temperature Too Low | Cure Temperature Too High | Cure Time Too Short | Cure Inhibition | Insufficient Vacuum | Excessive Shrinkage | Contamination | Moisture/High Humidity | Incompatible Insulation | Poor Mold Design | Mold Surface Rough | Mold Dirty | Insufficient Mold Release | Excessive Mold Release | **Corrective Action(s)** |
| Uncured Resin | • | • | | | | • | | • | • | | | • | | | | | | | | 1, 2, 3, 6, 8, 9 |
| Undercured (casting too soft) | • | • | • | | | • | | • | | | | | | | | | | | | 1, 2, 3 |
| Material Liquefies Under Heat | • | | | | | | | | | | | • | • | • | | | | | • | 2, 8, 9 |
| Tacky Surface | • | • | | | | | | | • | | | | • | | | | | | | 1, 2, 3, 6 |
| Surface Soft Spots | • | • | | | | | | | | | | | | | | | • | | • | 1, 2, 3, 10 |
| Surface Blemishes | • | • | | | | | | | | | | | • | | | • | | • | • | 1, 2, 3, 10 |
| Surface Voids | | | | | | | | | | • | | | | | • | • | | | | 7, 10 |
| Interior Voids | | | • | • | | | • | | | • | | | • | | | | | | | 5, 7 |
| Cracking | | | • | | | • | • | • | | | • | | | | • | | | • | | 1, 2, 3, 4, 5 |
| Distortion | | | | | • | | • | | | | • | | | | • | | | | | 4, 5 |
| Charring/Discoloration | | | | | • | | • | | | | | | | | | | | | • | 5 |
| Lack of Adhesion | | | | | | | | | | | | • | | | | | | | | 8 |
| Sticking | | | | | | | | | | | | | | | • | • | | • | | 10 |
| Poor Insulation Resistance | • | • | • | | | • | | • | | | | | | | | | | | | 1, 2, 3 |

**Corrective Actions(s):**

1. Mix components thoroughly in one mixing cup.
2. Check mixing process. Cure fresh sample with correct ratio.
3. Blend combined components completely until homogeneous (no striations).
4. Heat components, mold and/or resin to reduce viscosity or use less viscous resin.
5. Extend cure time.
6. Vacuum (de-air) resin prior to pouring.
7. Keep parts, mold and resin system clean.
8. Dry components completely before encapsulating.
9. Clean mold surface before using.
10. Use mold release sparingly. Apply to entire surface.