

Specifications:

EpoxySet is a colorless, clear, 8-hour, room temperature curing, cold mounting epoxy resin for potting/encapsulation of metallographic samples. It exhibits excellent adhesion, very low shrinkage, and minimal viscosity, allowing it to penetrate open pores and cavities to maximize edge retention and support.

Mixing Ratio* (by WEIGHT)

100:12 (Resin:Hardener)

Mixed Viscosity (CPS)

300

Curing Schedule (Room Temp 77 °F/25 °C)*

6-10 hours
1.25" dia. X 1" mold

Pot Life

2 hours @ 100 grams

Curing Temperature*

54 °C/130 °F

Hardness (Shore)

89 D

Chemical Properties

Non-soluble in water (cured)
Soluble in Epoxy Dissolver (#145-50210)

Shrinkage

0.00008%, Inch/Inch

Izod Impact/Tensile Strength

0.94/7600 psi

Light Refractive Index

1.519

*Optimum mixing ratio, larger volume mixtures cure at higher temperatures and more rapidly. See product (resin) label for details

Eliminating Bubbles & Air Pockets

To fill open pores/cavities and eliminate bubble formation, vacuum impregnation can be used. Open air pockets within a sample do not provide adequate support to the material at the interface and can lead to cloth contamination as debris transfers from the cavity to the next polishing cloth, leading to scratches in the polished surface.

WARNING!

Please be aware and read the following



Alkaline Corrosive Liquid

Contents are highly corrosive. Keep containers stored in well ventilated place in the original containers.

Skin Irritant

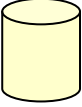
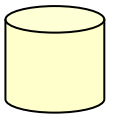
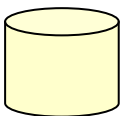
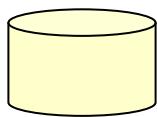
In case of contact with skin, immediately wash with soap and warm water. Consult the MSDS for additional information.

Use:

- 1) To improve adhesion and product performance, degrease/clean the sample prior to mounting using acetone, isopropyl alcohol, or an ultrasonic cleaner. Air dry, or heat dry, to evaporate residual moisture.
- 2) Weigh AND mix components in a SINGLE cup (do not use wax lined or paper cups).
- 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 and allow it to cure/harden.
- 5) If a vacuum is used, place the mounting cup into the chamber, and vacuum for about 3-5 minutes with 25 in/Hg (torr).

#175-30000
VacuPrep™ Epoxy
Impregnation System
10" (254 mm)
diameter chamber



<u>Mount Size</u>	<u>Cure Time (Hours)*</u>	<u>Mixing Ratio</u>	<u>Max Temperature</u>
 1"/25 mm	8-10	100:13	93° F (34° C)
 1.25"/32 mm	6-8	100:12	133° F (56° C)
 1.5"/38-40 mm	4-6	100:11	99° F (37° C)
 2"/50 mm +	3-4	100:8.5-10	109° F (43° 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 subjecting mixed & poured mount to 100-110 ° F heat for 30 minutes. Placing molds into a shallow bath of water will also 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

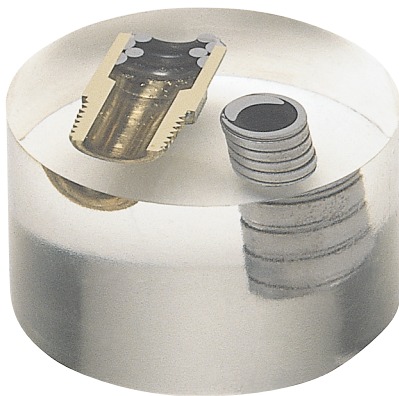
When measuring components of epoxy, be sure to do so by weight. If the ratio is off more than 0.5 grams, this will affect the curing characteristics, peak temperature, cure time and hardness. Be sure to measure both parts in the same cup.

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	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.