EpoxySet

Epoxy Mounting Resin

WARNING!

GHS05 GHS07 GHS08 GHS09

Refer to the SDS document for additional safety information.

Description

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
300 cP

Curing Schedule (Room Temperature)
6-10 hours *
(1.25" diameter x 1" height)

Pot Life
2 hours @ 100 g

Peak Exothermic Curing Temperature
54 °C (130 °F) *

Durometer Hardness
89D

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

Glass Transition Temperature
55-75 °C (131-167 °F)

Light Refractive Index
1.519

* 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.

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 2-hour 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 1 hour. This is not recommended for heat sensitive specimens.

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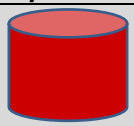
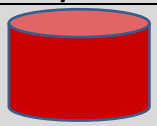
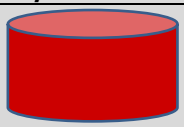
Back-Filling: Some samples have areas where there is no way to get epoxy into the structure that needs support. Back-filling is a process where the sample is mounted, then ground to expose the air pocket. The entire sample is then remounted in epoxy and vacuum is used to pull the air from the pocket 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.

Mount Size	Cure Time (Hours)*	Mixing Ratio	Max Temperature	Weight (g)**	
				Resin	Hardener
 1"/ 25 mm	8 – 10	100:13	93 ºF (34 ºC)	12.87	1.67
 1.25"/ 32 mm	6 – 8	100:12	133 ºF (56 ºC)	20.31	2.44
 1.5"/ 38 - 40 mm	4 – 6	100:11	99 ºF (37 ºC)	29.51	3.25
 2"/ 50 mm	3 – 4	100:8.5 - 10	109 ºF (43 ºC)	41.67	4.17

***** 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 the room is colder, the cure time and hardness will be affected. If heat is applied, the cure time will be accelerated. Cure time can be accelerated by subjecting the mixed and poured mount to 100 °F (38 ºC) heat for 10-15 minutes. 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. Placing molds into a shallow bath of water will also reduce exothermic heat. If additional heat is applied, however, the epoxy may shrink and yellowing of the epoxy can occur. The exact temperature needed to cure an uncured sample would need to be tested. If the mixing ratio is off by more than 0.5 grams, the curing characteristics, peak temperature, cure time and hardness will vary. Be sure to measure both parts in the same cup.

****** Per one (1) mount

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

Note: If pouring more than 200g at a time, the heat may be too great for the sample and the mount could cause smoking and fuming of the epoxy as well as degradation of the sample and the mold. Reducing the amount that is mixed and poured may help reduce heat and allow for a better cure. It is recommended to mix only about 150g or 0.5 lb. at a time and to pour no more than can cover 0.5"-1" segments. Use of a conductive mold, like a steel cylinder, would also reduce heat.

Epoxy Troubleshooting

Problem	Cause	Solution
Uncured or Soft Mount	Incorrect Mixing Ratio	Adjust the mixing ratio per mold size and add more or less hardener as needed.
	Insufficient Mixing	Mix for up to 5 minutes for complete homogeneity (no striations).
	Incompatible Mold	Use an insulating mold to contain the heat necessary to harden the mount.
	Mount Mass Too Small to Harden	Mix more epoxy to create a larger mount.
Tacky Surface	Incorrect Mixing Ratio	Adjust the mixing ratio per mold size and add more or less hardener as needed.
	Insufficient Mixing	Mix for up to 5 minutes for complete homogeneity (no striations).
	Moisture/High Humidity	Cure the mount in a less humid environment.
	Excessive Mold Release	Use mold release sparingly.
Surface Gaps/Holes	Insufficient Vacuum	Extend or repeat the vacuum cycle.
	Excessive Shrinkage	Add less hardener and soak the mold in a water bath during the cure cycle to reduce heat.
Interior Voids/Bubbles	Insufficient Vacuum	Extend or repeat the vacuum cycle.
		Add a pressure cycle after the vacuum cycle.
Cracking	Excessive Shrinkage	Add less hardener and soak the mold in a water bath during the cure cycle to reduce heat.
Mount Warping, Bubbling or Discoloration	Incorrect Mixing Ratio	Adjust the mixing ratio per mold size and add more or less hardener as needed.
	Mount Mass Too Large	Add less hardener and soak the mold in a water bath during the cure cycle to reduce heat.
	Excessive Shrinkage	
	Incompatible Mold	Use silicone with a water bath or steel molds for large mounts to conduct away excess heat.
Sticking	Incorrect Mixing Ratio	Adjust the mixing ratio per mold size and add more or less hardener as needed.
	Cure Time Too Short	
	Insufficient Mold Release	Add more mold release or use a different kind.
	Rough Mold Surface	Buff the inner walls of the mold until smooth or use a new mold.
Blemishes	Rough Mold Surface	Buff the inner walls of the mold until smooth or use a new mold.
	Dirty Mold	Clean mold of excess debris and particulates.
Interior Gaps/Lack of Adhesion to Sample	Sample Contamination	Properly clean the sample of dirt and oils before mounting.