

TJ2227 Conductive epoxy resin

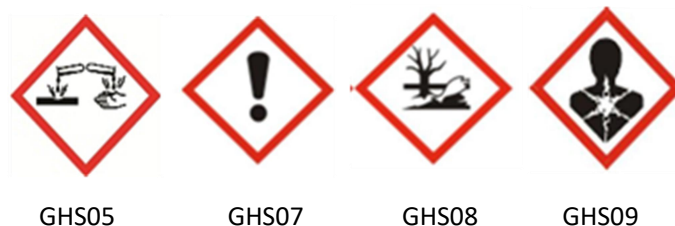
Introduction

This epoxy resin is a conductive cold mounting material, consisting of two components - resin and curing agent, both in liquid state; Mix the resin and curing agent in a certain proportion at room temperature (25°C). After 2-4 hours, it will solidify into a transparent hard material, and the material can be ground, polished and processed. This material can satisfy the mounting needs of various inorganic material samples. It has good edge protection performance and electrical conductivity, the shrinkage rate is also very low. TJ2227 is suitable for cold mounting sample preparation of SEM electron microscopy analysis various micro metallographic samples.



Safety Precautions

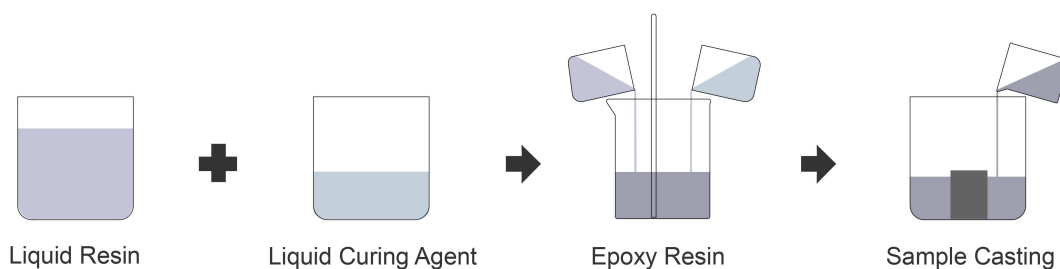
1. Avoid contact with resins, hardeners and mixed epoxy resins. Wear protective gloves when handling epoxy resins. If you have resin, hardener or mixed epoxy on your skin, remove it as soon as possible. Resin is not water soluble - use a waterless skin cleaner to remove the resin or mixed epoxy. Hardener is water soluble - use soap and warm water to wash the hardener off the skin. After using epoxy, wash thoroughly with soap and warm water. If you spill epoxy on clothes, replace it immediately.
2. Protect eyes from contact with resins, hardeners and mixed epoxy resins.
3. Resin may generate vapors after mixing, avoid inhalation.
4. Avoid accidental ingestion of epoxy resin. Wash hands thoroughly after using epoxy, especially before eating or smoking.

Warning!**Mixing ratio and characteristics**

It is important to use the correct and precise mixing ratio, so gravimetric method is recommended. The mixing ratio of different products is shown in the table below. Too much or too little hardener will cause the mounting compound not to fully develop its potential and is not recommended.

Mixing ratio (by weight)	2:1 (Resin:Curing agent) *
Mixed viscosity	360 cP
Curing time (22-25℃)	2-4 h *
Operation time	5-10min @ 100 g
Peak temperature	92℃*
Hardness	80 D
Chemical properties	Insoluble in water (after curing)
Solubility after solidification	Soluble in Trojan's special epoxy resin dissolver
Contractility	0.00019%,
Vitrification temperature	55-75℃
Edge Protection	good
Refractive index of light	1.519

* The above data is 30mm in diameter, 20mm in height, tested at 25℃

Operation method

Preparation In order to improve the adhesion of the mounting material and prevent the foreign matter in the material from seeping out, it is necessary to use alcohol or isopropyl alcohol for ultrasonic cleaning, and then use a dryer or blower to remove the liquid on the surface of the sample.

Mix Using a balance with an accuracy of 0.01 g, weigh and mix the resin and curing agent in a single plastic cup (do not use wax-lined cups or paper cups) and stir slowly (in order not to generate air bubbles). It needs to be stirred thoroughly. It is recommended to stir for 2-3 minutes (or about 200 times) until the mixture has no streaks.

Pouring Slowly pour the mixture into the mold without trapping air around the sample. A stir bar can be used to drain the mixture directly onto the sample.

Mounting Generally speaking, the higher the temperature, the faster the curing time. Therefore, if you want to accelerate the curing, you can put the mold in an oven to bake and heat it, and adjust the temperature of the oven to 50°C.

Release The cured epoxy would stick to the surface of the mold due to low shrinkage and adhesion to almost all types of surfaces. Before pouring the mixed epoxy into the mold, the sides and bottom of the mold can be treated with a liquid release agent to make it easier to remove the cured mount.

Eliminate air bubbles To fill the pores and eliminate air bubbles after curing, a vacuum or pressure cooker can be used. Connected pores within the sample do not provide sufficient support for the material at the surface and would introduce debris during the grinding and polishing process. The debris may contaminate the polishing cloth and can leave scratches on the surface of the cloth.

If you use a vacuum mounting machine, put the cup into the vacuum chamber and keep it in a vacuum state (vacuum degree below -0.8bar) for 3-5 minutes. Then slowly release the vacuum, repeating 2-3 cycles as needed.

Other information

Second glue-pouring: This is for sample areas where the epoxy cannot be adequately filled into the structure that needs to be supported. Second glue-pouring is to expose the pores of the sample by grinding after the sample is mounted, and then re-embed the entire sample in epoxy resin, and use a vacuum mounting machine to extract the air bubbles to fully fill the epoxy resin. thereby providing support for the structure. For Second glue-pouring, ensure that sufficient epoxy resin is used for complete curing and hardening.

Sample Removal: If the specimen needs to be removed from cured epoxy or incompletely cured epoxy; it can be dissolved using Trojan's Epoxy Dissolver. If the specimen is previously ground or cut, the time required to

dissolve the epoxy resin can be reduced.

Mixing ratio:

Diameter	Time	Recommended Ratio
 1"/25mm	3-4h	2:1.05
 1.25"/30-32mm	2-3h	2:1
 1.5"/38-40mm	1.5-2h	2:1
 2"/50mm	1-1.5h	2:0.95

* The mixing ratio and room temperature will affect the performance and the data in the table above.

The data in the table above applies to a room temperature of 25°C. If the room is colder, curing time and hardness will be affected. If heated, the curing time will be accelerated. Heating the mixed and poured mounted specimen at 38°C (100°F) for 10-15 minutes will speed up the curing time. The greater the mass, the higher the exothermic temperature reached during curing and the faster the epoxy cures. Keep this in mind when mounting heat-sensitive samples in larger mounting molds. Placing the mold in water will also reduce the heat release. However, if additional heat is applied, the epoxy may shrink and the epoxy may turn yellow. The exact temperature needed to test cured and uncured samples is required. If the mixing ratio deviates by more than 10%, then the curing properties, peak temperature, curing time and hardness will change. Be sure to measure the mixing ratio of epoxy resin and hardener in the same container.

Note: "Single-use plastic mounting molds" are not recommended unless they are cooled in water to avoid melting of itself during the mounting and cooling process.

Note: If more than 200g is poured at one time, the sample will generate too much heat during mounting, which may cause the epoxy resin to explode, and cause damage to the sample and mounting mold. Reducing the amount of mixing and pouring can help reduce heat and achieve better curing. It is recommended that the mixing amount should not exceed 100g at one time, and the pouring height should not exceed 20mm. Using conductive molds, such as steel molds, would reduce heat.

Fault Resolution

Problem	Reason	Solution
Uncured or Softened After Mounting	Incorrect mix ratio	Adjust the mixing ratio according to the size of the mold, adding more or less hardener
	Insufficient mixing	Mixing and blending for up to 5 minutes to obtain complete homogeneity (no streaks)
	Incompatible molds	Use insulated molds to accommodate heat-emitting mounts
	Sample mass too small to cure	Mix more epoxy for larger mounted specimens
Surface Viscosity is too High	Incorrect mix ratio	Adjust the mixing ratio according to the size of the mold, add more or less curing agent
	Insufficient mixing	Mixing and blending for up to 5 minutes to obtain complete homogeneity (no streaks)
	Damp/high humidity	Mounting in an environment with low humidity
	Excessive release	Reduce the amount of release agent
Surface Gaps/Holes	Insufficient vacuum	Extend or reuse vacuum pump cycle times
	Excessive contraction	Add a small amount of curing agent, and place the sample in cold water during the curing process to reduce the temperature
Internal Voids/Bubbles	Insufficient vacuum	Extend or reuse vacuum pump cycle times
		Use a pressure cooker after vacuuming
Cracking	Excessive contraction	Add a small amount of curing agent, and place the sample in cold water during the curing process to reduce the temperature
Deformation, Blistering or Discoloration	Incorrect mix ratio	Adjust the mixing ratio according to the size of the mold, add more or less curing agent
	Excessive quality	Add a small amount of curing agent, and place the sample in cold water during the curing process to reduce the temperature
	Excessive contraction	
	Mold is not suitable	Larger sizes can use silicone (cooled by immersion in water) and steel molds to conduct excess heat
Viscous	Incorrect mix ratio	Adjust the mixing ratio according to the size of the mold, add more or less curing agent
	Curing time is too short	
	The release agent is not suitable	Add more release agent or use a different type of release agent

	Rough mold surface	Clean the inner wall of the mold until smooth, or use a new mold
Surface Defects, Unclean Mold	Rough mold surface	Clean the inner wall of the mold until smooth, or use a new mold
	Mold is not clean	Clean excess debris and particles from the mold
Insufficient Internal Clearance/Adhesion of the specimen	Contaminated samples	Before mounting, clean the dirt and oil stains on the sample