

Technical Information
Electronic and Engineering Materials & Secondary Insulation

TI- 4000
Procedure for Handling Crystallized
Epoxy Resin

TI - 4000 PROCEDURE FOR HANDLING CRYSTALLIZED EPOXY RESIN

What is Crystallization?

The crystallization of liquid epoxy resins often comes as a surprise to many of us. When a drum or can of epoxy resin is opened the resin could be turbid or even solid. This phase change from liquid epoxy to semi or solid state is crystallization. This phase change is similar to when water freezes and changes from liquid to solid. When the temperature is increased it returns to its original liquid state. The water is exactly the same as it was before and after crystallization and there is no property change as the water goes through these changes. The same is true for liquid epoxy resins.

Solutions

Crystallization is typically more an inconvenience than a problem. Increasing the temperature of the liquid or filled system slowly to 50 – 60 °C (122 – 140°F) will allow the crystals to liquefy.

Crystallization may be seen as cloudiness, free floating crystals, crystal masses, or a completely solid mass. The resin crystals have a slightly higher density than the liquid epoxy, they will normally settle to the bottom. Initial indication would be the resin looks foggy, hazy or turbid to milky. After a while, a white sedimentation begins to build on the bottom which can then build until the entire contents are solidified.

In order to reconstitute the epoxy the resin system should be slowly heated to 50 - 60°C (122 - 140°F). Make sure the temperature is being transferred throughout out the resin. Hold the resin at this temperature until the material becomes clear or in the case of filled materials when the viscosity is in the normal range. Mix as necessary to insure the material a homogenous 50 – 60°C (122 – 140°F) and crystalline free. This process does not damage the resin or affect its performance.

Exercise the necessary precautions for handling hot liquids including but not limited to venting containers.

Reconstitution of crystallized resins and hardeners should **NOT** be attempted with latent catalyst (one component) and solvent containing systems, due to exothermic and flammability hazards.

Good house keeping is the best way to prevent crystallization. Keep containers clean and store resin and hardeners properly do not allow temperature fluctuations.

Causes

Causes can be purity of resin system, fillers, pigments, additives, diluents and fluctuating temperature. Usually the presence of an initiating seed is required to start crystallization phenomenon.

Epoxy experts have assured us crystallization is unpredictable and there are no fixed rules. Limiting temperature fluctuations however will reduce the tendency to crystallize. If crystallization does occur, simply warming the resin to the melt point of the crystals is an easy way to deal with this common phenomenon.

The above properties are typical values and are not intended for specification use.

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