

Resin Research EPOXY SYSTEMS

Crystallization of Liquid Epoxy Resins

During the past winter we've had several complaints about the viscosity of Resin Research Epoxy Resin. This is not a problem with the resin. The Epoxy Resin should always leave our warehouse in perfect condition.

In certain conditions, the Epoxy appears "frozen"; solid or slushy in appearance. This condition is not of concern – it is crystallisation of liquid Epoxy and is a well- known condition occurring particularly with pure forms of epoxy where less additives change its state. Some component parts of Epoxy form crystal structures, especially if the resin has undergone several changes of temperature. This happens when storage is in cooler conditions – even for a few hours – or when the Epoxy is cooled during extended delivery.

The initial signs of crystallisation are when the Epoxy is less clear, cloudy or having a bluish milky appearance. This opacity is the first sign of small crystals floating in the resin. These then increase in size, as crystals do, turning the solution to a more solid state with clumps of resin solidifying. These clumps can then sink to the bottom of the resin. The resin also begins to pour less easily and seems thick and jellified.

Just as water freezes and changes its state from liquid to solid – and can be melted to return it to its liquid state – so with Epoxy. And just as water is not affected by its change in state – neither is Epoxy. The problem is this: water freezes at 0°C and melts again at above that temperature. Epoxy begins to crystallise at low temperatures, but its melting point is much higher – around 45° – 50°C. So:

- Keep Resin Research Epoxy warm at all times – store above 21°C whenever possible. Always store off the floor as concrete can act as a heat sink.
- If crystallisation occurs, place the container in warm or hot water at or above 50°C (120° F) and leave it there for several days if necessary, shaking or turning the bottle several times to ensure the bottom mass, if any, is incorporated - certainly until all signs of crystallisation revert and the resin is clear and liquid again. (It will then stay in this state for months or years and can be repeated as necessary without any effect on the quality or structural characteristics of the Epoxy). A hot water cupboard is ideal for maintaining temperatures, or on top of a boiler or radiator for an extended period to reincorporate the crystals.
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- Keep in mind the resin in a crystallised state will not have enough liquid epoxy to ensure correct mix ratios. It must be returned to a fully liquid state.
- Blend or shake the resin frequently at any temperature.
- Keep the container sealed always. Dust or contaminants are perfect initialisers of the process as crystal form around impurities.
- Remember, pure and unadulterated resins are more likely to crystallise.
- Lower viscosity resins, like Resin Research Quik Kick and 2000CE ultra, are also more likely to crystallise as their more liquid matrix makes it amenable to change.
- The process of re-incorporating crystals back into Epoxy may take some time at elevated temperatures. This will not affect the quality of the resin, or its reactivity, unless it remains at elevated temperatures, in which case the resin will be highly reactive. It is best to return it to an ambient temperature of between 20° and 25°C before use.
- Greg Louer, the creator of Resin Research, suggest a minute or so in the microwave oven is effective. This will not affect the molecular structure in the least. Try several periods of 30 seconds until the resin is clear again and stays in the state for several hours.

Remember, the process of heating the resin is completely safe and effective. It just takes time. Please understand that the resin leaves our factory in a perfect liquid state, as we store in elevated temperatures. Normally it should stay that way for weeks or even months, but subsequent changes may occur in conditions beyond our control. We cannot replace resin that crystallises or is returned after a period longer than a few days, unless it is delivered to you in a crystallised state.

Once the resin is back in its original state, it is perfectly safe and suitable for all applications at the recommended mix ratios.

Please call our Technical Department for further advice if required.

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