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## **EPOXY CRYSTALLIZATION**

### **INTRODUCTION**

An unpredictable and therefore perplexing phenomenon affecting the shipping and storage of epoxy resins is crystallization. Crystallization is the formation of solid crystals from a uniform liquid resin. Crystallization starts out slowly from single tiny seed crystals. In a clear liquid, these crystals may appear as tiny specks or cloudiness. The crystals eventually settle to the bottom of the container due their higher density than the resin. In the final stage, complete solidification of the resin may occur.

What can be confusing is the random occurrence of crystallization in containers of product from the same batch subjected to identical conditions from mix to pack to ship to receipt. One container may have evidence of crystallization, while the container directly next to it on the shelf may be completely free of crystals.

### **SOLUTIONS**

Fortunately, crystallization occurs infrequently and is a reversible, physical change - not a chemical one. Reversal of crystallization is straightforward - heat to 120° - 140°F and either stir or otherwise agitate the solid or sludge-like matter until it reverts back to a liquid state. Before heating however, loosen the cover or cap of the container and place in a well-ventilated area. Since the crystals settle to the bottom, be certain that there are no remaining crystals which may then act as seeds for recrystallization. Finally, clean any lids and container threads which may as a source of new epoxy seeds. Storage at constant room temperature at or above 25°C (77°F) is recommended.

Do not heat one-component epoxy systems. Please contact Leepoxy Plastics for further assistance.

### **CAUSES OF CRYSTALLIZATION**

Crystallization is affected by several factors: the relative purity of the reactive resin, any thermal shock from hot to cold, and/or cool temperature, usually below 55°F, for prolonged periods. There is no direct correlation involving any one or any combination of the above conditions so we are reduced to generalities. The higher the purity of the epoxy resin, the greater the thermal shock, and the longer the dwell time at the cold temperatures, the more susceptible the product is to crystallization. Unfilled resins tend to crystallize more than filled resins. Low viscosity-fully reactive resins tend to crystallize more than higher viscosity resins.