Twin Pack Mixing & Dispensing

Twin Pack Mixing

Twin packs consist of pre-weighed resin and hardener contained in a tough flexible film and separated by a removable clip and rail.

Once the clip and rail is removed the resin and hardener can be thoroughly mixed within the bag and is then ready for use.

Mixing will normally take around 3 minutes depending on the operator and viscosity of the material. Twin packs are ideal for small to medium production runs, prototyping and on site or field use.

Spillage & Cleaning

All equipment contaminated with mixed material should be cleaned before the material has hardened. Robnor ResinLab TS130 is suitable non-flammable cleaning agent, although other solvents may be found suitable. TS130 will also remove cured material provided it is allowed to soak for a number of hours.

Yet with the addition of another chemical "table salt", the water freezes at much lower temperatures. The closer a high purity resin gets to the point where it changes from a liquid to a glassy crystalline solid state the greater the chance minute crystals will start to form. These crystals act as seeds and in combination with other factors can rapidly change the liquid to a solid.

Low Viscosity

Low viscosity resins are very low in molecular weight and short chained. The lower the viscosity the easier the liquid epoxy can move and orient itself around seed crystals. High molecular weight, high viscosity materials are longer chained and less prone to crystallise. Storing a "seed" free liquid at low (0°C) temperatures will slow molecular motion and impede crystal formation and growth. Diluents and modifiers generally increase the rate of crystal formation and growth, however there are significant differences on the tendency to crystallise between diluents. Other additives, such as pigments, fillers and wetting agents, can also affect the rate of crystal formation and growth. Generally, if one prevents the introduction of seed crystals into a resin handling system, crystallisation will be a rare event unless one is handling high purity resins.

Impurities

Impurities, usually minute particulate matter, can often act as "seeds" in unfilled systems, initiating the formation of resin crystals which then continue to propagate. Fillers rarely initiate crystallisation due to their large size and high content, actually they often act to inhibit crystallisation.

Extreme Cold

While cold does impede growth by slowing movement, extreme cold (-40°C) accelerates crystal formation once seed crystals have formed and if low enough can cause complete crystallisation by itself.

Temperature Cycles

Temperature cycles as little as 20-30°C can create a vicious circle that is the most common cause of crystallisation. Once the material is warmed molecular motion is enhanced allowing liquid epoxy to orient itself around "seed" crystals. Subsequent exposure of an "oriented" material to cold temperature will then accelerate crystal growth. Once started the crystallisation typically goes to completion resulting in a solid mass. The temperature fluctuations that occur between daytime and nighttime temperatures can initiate and/or accelerate the crystal growth process. These can occur during transit, while sitting on a loading dock or the production floor.

Solutions

Crystallisation in base resins and two component formulations is a major inconvenience but not an insurmountable problem. Heating these materials several hours at 50-60°C easily reverses the phenomenon. All the crystals must be completely melted as any microscopic unmelted crystals will act as "seeds" and cause the crystallisation to return in days. Along with the gentle heating the material should also be stirred and the container sides and bottom scrapped to assure all crystals have been melted and the heat is being evenly distributed. If crystals reappear, merely apply heat and remelt. One component systems should not be heated as product damage or curing may occur. Controlling and monitoring shipping and storage conditions is critical for minimising temperature fluctuations. Good housekeeping is another factor as container spouts, spigots and closures must be kept free of resin buildup to prevent crystal formation here as well. While epoxy compounders and end users have heightened their awareness to crystallisation it still remains very difficult to accurately predict or eliminate. If crystallisation remains a recurrent problem, products less prone to crystallise may have to be evaluated as alternatives.

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