

Syneresis

A few thickened adhesives (VT and GEL grades) occasionally exhibit syneresis. Syneresis appears as a thin film or puddles of low-viscosity adhesive on top of the thicker adhesive. Sour cream and yogurt are familiar products that also exhibit syneresis.

The composition of the low-viscosity syneresis liquid is chemically identical to the thickened material. It has the same chemical and bonding properties but the viscosity is much lower.

Time and colder temperatures (like refrigeration) can promote syneresis. Therefore, First In, First Out (FIFO) inventory control is recommended. Refrigeration is not recommended for syneresis-prone materials. In fact, mild heating can reverse the syneresis in some products.

Once syneresis has occurred, mixing is the most common method of returning the mixture to a homogeneous state. Mixing can be accomplished with a traditional paddle or spatula (being careful to minimize air entrapment) or mixing can be accomplished through the use of a static mixer.

A static mixer is a tube containing a series of static mixing vanes. When the resin flows through the static mixer, it folds upon itself until mixed. Static mixers are commonly used to mix two-part adhesives because they do not add air to the adhesive. Static mixers are an excellent way of restoring a product that underwent syneresis to its original state. A static mixer used for syneresis mixing does not have to be replaced frequently. A stainless steel static mixer can be incorporated into the permanent dispensing fluid line.

Pressure pots are not recommended for adhesives that may undergo syneresis. The feed tube in the pressure pot creates a well in the resin. The well encourages syneresis – this is similar to sour cream where syneresis occurs much more rapidly after the first spoonful than before. For pail-size products, the product should be ordered in straight-sided pails and a ram pump should be used to dispense the adhesive. The ram plate flattens the adhesive and applies a consistent pressure across the top of the pail. No well forms, which minimizes the occurrence of syneresis.

Contact Dymax Application Engineering for more information on syneresis.

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