



Two Component Mix Ratios & Why They Are Important

A mix ratio for a two component epoxy or urethane system is the ratio used to determine the amount of resin and catalyst (may also be referred to as hardener or curing agent) required to obtain a full cure of the system. These ratios are determined by the chemicals that make up both the resin and the catalyst and must be followed or curing difficulties can occur. Some common cure problems are:

- No Cure
- Soft Cure
- High Exotherm During Reaction Causing Shrinkage

Mix ratios can be expressed by weight, by volume, or PHR (parts per hundred). Due to differences in density between resins and catalysts the ratio by weight and the ratio by volume will be different in many cases. The most common expressions for materials that are to be mixed by hand are by weight or PHR (PHR is also a measurement by weight). When this is the case, the correct amounts of resin and catalyst are measured out on a scale and mixed together. Lets work through an example.

20-3001 is a popular epoxy potting system. It's mix ratio is 1:1 by volume or 83 PHR of 20-3001 Catalyst (100:83 by weight). Measurements by weight are more accurate and therefore recommended over volumetric proportioning.

A user will need to estimate the amount of mixed material required for an operation. It is also important to know the working time (pot life) of the product so that too much material is not mixed together and wasted. Let's assume 150 grams of resin are measured out on a scale. To determine the amount of catalyst we need for a proper cure we will use the following equation:

$$\text{PHR}/100 \times \text{Weight of Resin} = \text{Weight of Catalyst}$$

Since we have a PHR of 83 our calculations would look like this:

$$83/100 \times 150\text{g Resin} = 124.5\text{g Catalyst}$$

In order to achieve a proper cure with 150 grams of resin we would need 124.5 grams of catalyst.

When using highly filled epoxy or urethane systems it is imperative that you mix both the resin and the catalyst (if the catalyst is also filled) prior to measuring and mixing. Over time the filler in these systems have a tendency to settle. If they are not mixed prior to being used a catalyst rich or resin rich mix can occur. It is also important that you mix the two components together thoroughly as this can also lead to curing problems.

If you have any questions or concerns regarding mixing or mix ratios please feel free to contact Epoxies, Etc...

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