

Overbake Resistance of Powder coatings

BACKGROUND

Overbake resistance of powder coating is an important aspect when selecting a product, designing an oven, or writing a specification.

HI TEMPERATURE RESISTANCE VS OVERBAKE

High temperature resistance is the term used when checking a coating at a temperature higher than the recommended cure temperature. Overbake is checked by checking a longer time at the recommended cure temperature.

CHEMISTRY OF OVERBAKING

Raw materials based on carbon, for example resins and organic pigments, will break down at high temperatures.

When a coating is baked too long or at too high of a temperature, the polymer or pigments break down causing a drop in gloss, change in color, or yellowing.

It is not recommended to expose a typical powder coating above 410°F.

COMPARISON

Chemistry	Overbake Resistance
Epoxy	Poor
Hybrid	Good
Polyester	Excellent

OVERBAKE EVALUATION

100% Overbake is defined as twice the amount of time in an oven at the recommended cure temperature.

After overbaking, the coating is evaluated primarily for gloss and color. These properties are usually checked visually by comparing to a panel or part at the recommended bake schedule. In lab these can be checked with a gloss meter or spectrophotometer.

Polyester TGICs and Polyester Urethanes typically have excellent overbake resistance which means there is no change in color or gloss. In contrast, epoxies have poor overbake resistance because they tend to yellow.