

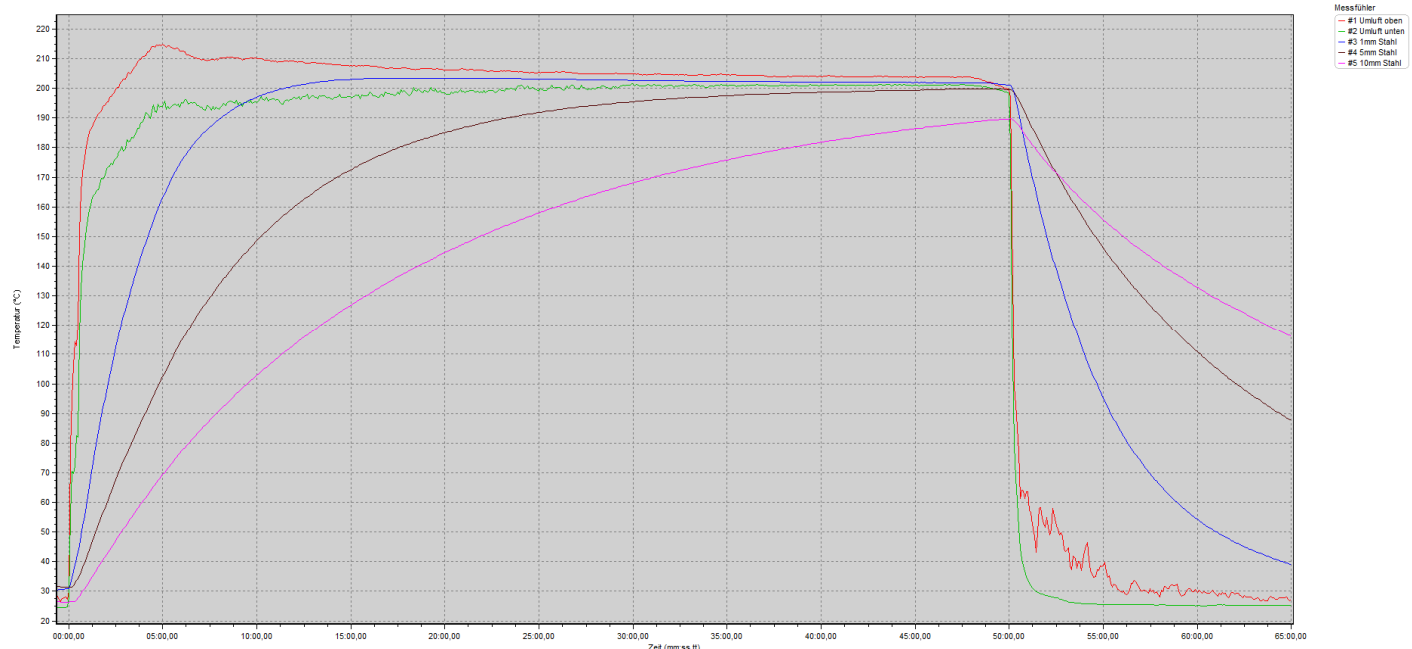
Baking and curing of powder coatings

The baking conditions stipulated by the powder coating manufacturer and the temperature profile of the object to be coated during the baking process in the furnace must be known and taken into consideration accordingly.

The baking conditions can be found on the product-specific technical data sheet.

Furnace temperature measurements (air circulation and object) can be used to define and/or check the process parameters required for the coating in order to define the holding times for different temperature settings.

If a system is newly installed, the correct measurement procedure must be carried out by the system manufacturer during the course of the handover.



According to the measurement protocol, it is evident that the substrate thickness has a significant influence on the process parameters. Not only the curing of the thickest substrate has to be ensured but also that the overbaking of the thinnest substrate is as insignificant as possible.

Insufficient cross-linking (underbaking)	
Fault	Test methode
Poor adhesion	Cross cutting, scratch test
Brittle coating layer	Scratch test (splintered coating layer)
Deterioration of mechanical resistance	Impact resistance, mandrel bending test
Deterioration of corrosion protection	Condensation water test, salt spray test
Deterioration of chemical resistance	Test following exposure to the respective reagent
Insufficient matting	Gloss level measurement

Overbaking	
Fault	
Yellowing (embrittlement in extreme cases)	Visual, colour measurement
Gloss level deviation	Gloss level measurement
Insufficient adhesion of two coating layers	Recoatibility with cross cutting

Rule of thumb for calculating the **baking time** in conventional baking furnaces

- a) Curing time of the powder coating system
- b) 6 minutes for the “first” millimetre of substrate thickness
- c) 3 minutes for each “additional” millimetre of substrate thickness

According to the “rule of thumb”, for example, a powder coating system with baking conditions of 10 min. at an object temperature of 180°C and a set furnace temperature of 200°C would require the following process parameters for a substrate thickness of 5 mm.

a) 10 minutes b) + 6 minutes c) + 12 minutes = 28 minutes

Different substrate thicknesses and higher air speeds in the furnace may have a positive influence on this calculation in terms of the temperature setting and/or holding time.

Please do not hesitate to contact us for further information.