

APPLICATION SHEET

Polymers – Paints & Coatings

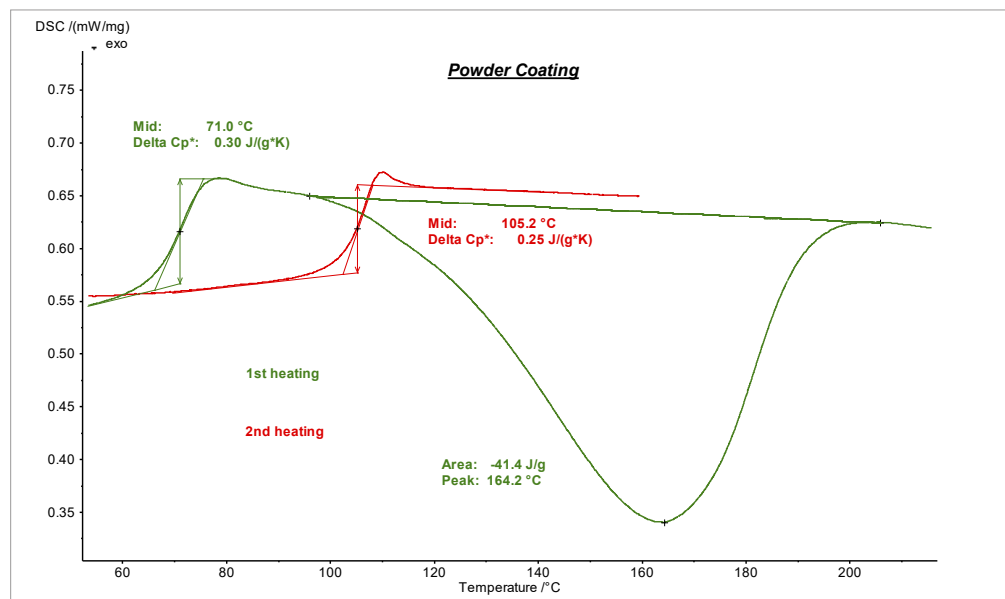
DSC

Epoxy Powder Coating

Introduction

Powder coatings are dry types of coatings which are applied as a free-flowing, dry powder. The main difference between a conventional liquid paint and a powder coating is that the powder coating does not require a solvent to keep the binder and filler parts in a liquid suspension form. The coating is typically applied electrostatically and is then cured under heat to allow it flow and form a "skin." The powder may be a thermoplastic or thermoset polymer. It is

usually used to create a hard finish that is tougher than conventional paints. Powder coatings are mainly used for coating of metals, such as "white goods", aluminum extrusions, and automotive and motorcycle parts. The most common polymers used for the production of powder coatings are polyester, epoxy or acrylics. During production, the polymer granules are mixed with hardener, pigments and other powder ingredients. The mixture is heated in an extruder, rolled flat, broken into small chips and then milled to make a fine grained powder.



Test Conditions

Temperature range: 25 ... 230°C, 25 ... 160°C
Heating/cooling rates: 20 K/min
Atmosphere: Nitrogen (20 ml/min)
Sample mass: 7.37 mg
Crucible: Al, pierced lid

Test Results

The endothermic step detected at 71.0°C (midpoint) during the first heating indicates the glass transition of the powder coating before curing. The exothermic peak at 164.2°C (peak temperature) results from curing of the sample. In the second heating, the glass transition was shifted to 105.5°C. Due to cross-linking, the step in specific heat was smaller than in the first heating (0.25 J/(g·K) to 0.30 J/(g·K)).