

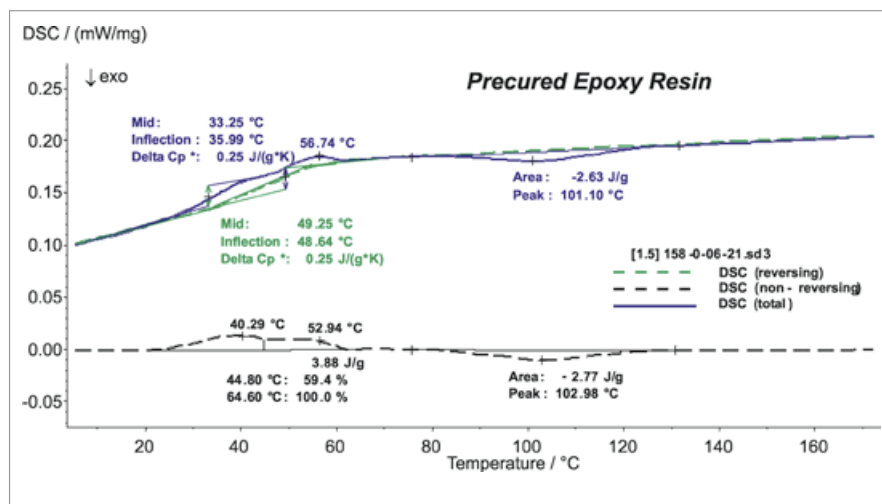
# APPLICATION SHEET

## POLYMERS – AUTOMOTIVE

### EPOXY RESIN (PRE-CURED)

Epoxy or polyepoxide is a thermosetting epoxide polymer that cures (polymerizes and crosslinks) when mixed with a catalyzing agent or “hardener”. Most common epoxy resins are produced from a reaction between epichlorohydrin and bisphenol-A. The first commercial attempts to prepare resins from epichlorohydrin occurred in 1927 in the United States. Credit for the first synthesis of bisphenol-A based

epoxy resins is shared by Dr. Pierre Castan of Switzerland and Dr. S.O. Greenlee in the United States in 1936. The applications for epoxy based materials are extensive and include coatings, adhesives and composite materials such as those using carbon fiber and fiberglass reinforcements, (although polyester, vinyl ester, and other thermosetting resins are also used for glass-reinforced plastic).



#### Instrument

DSC 204 **F1** Phoenix®

#### Test Conditions

Temperature range	0 ... 170°C
Heating/cooling rates	2 K/min (modulated)
Atmosphere	Nitrogen (20 ml/min)
Sample mass	11.01 mg
Crucible	Al with lid
Sensor	τ sensor

#### Results

The specific heat flow rate was measured with the DSC 204 **F1** Phoenix® employing the temperature-modulation software. It can clearly be seen that the glass transition, relaxation and post-curing effects can be separated from each other by the temperature modulation software. The relaxation/melting effects can be seen at 40 and 53°C (black curve, non-reversing part). Post-curing occurred at 103°C (peak temperature). In the reversing part, the glass transition can be seen at 49°C. In the entire DSC curve, all effects are superimposed.