

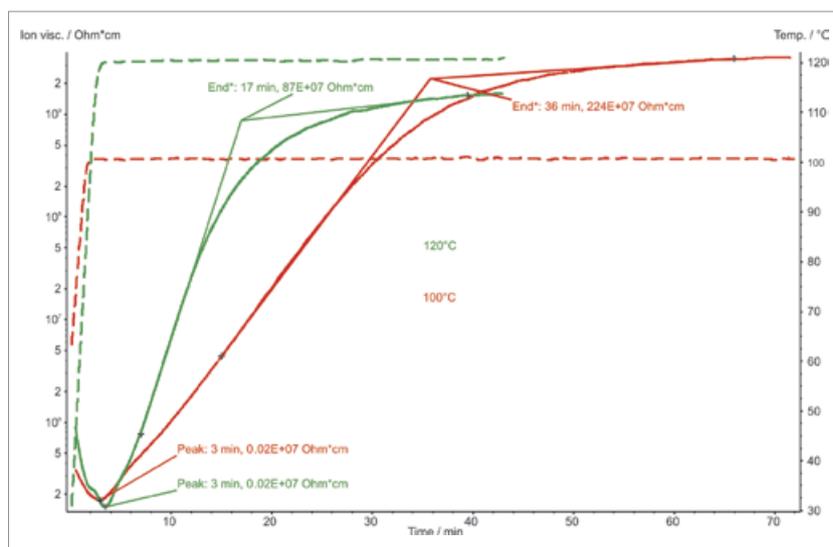
APPLICATION SHEET

POLYMERS – AUTOMOTIVE

POLYIMIDE RESIN

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 thermo-setting resins are also used for glass-reinforced plastic).



Instrument

DEA 230/2 *Epsilon*

Test Conditions

Temperature range	30 ... 80°C, isotherm 30 ... 120°C, isotherm
Heating rate	10 K/min
Sample preparation	resin:hardener = 100: 3
Sensor	IDEX (comb structure and electrode distance of 115 µm)
Frequency	1 kHz
Atmosphere	air (static)

Results

At the beginning of both tests, the ion viscosity decreased. This effect is due to softening of the sample because of the increase in temperature. After 3 minutes, the ion viscosity increased; this corresponds to the beginning of curing. The increase in ion viscosity is sharper for the measurement at 120°C compared to the measurement at 100°C, indicating a more reactive curing. Furthermore, the reaction finished earlier at 120°C than at 100°C (endset time of 17 minutes to 36 minutes). At the end of the measurements, the ion viscosity of the cured samples is higher at 100°C than at 120°C because of the influence of the temperature on the viscosity of the cured samples.