

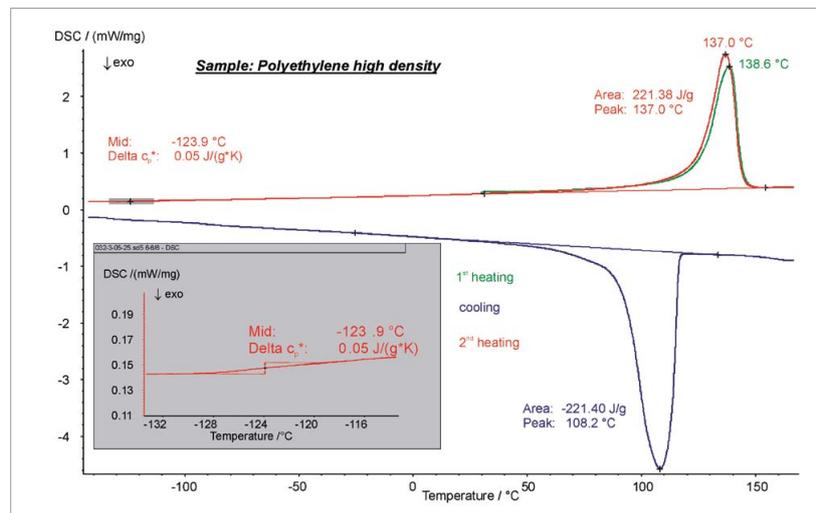
APPLICATION SHEET

POLYMERS – POLYMER MANUFACTURING

POLYETHYLENE HIGH DENSITY

Polyethylene is a thermoplastic commodity heavily used in consumer products (over 60M tons are produced worldwide every year). Polyethylene high density (HDPE) is defined by a density of greater or equal to 0.941 g/cm³. HDPE has a low degree of branching and thus stronger intermolecular forces and tensile strength. HDPE can be

produced by chromium/silica catalysts, Ziegler-Natta catalysts or metallocene catalysts. The lack of branching is ensured by an appropriate choice of catalyst (e.g. Chromium catalysts or Ziegler-Natta catalysts) and reaction conditions.



Instrument

DSC 200 **F3** Maia®

Test Conditions

Temperature range	25 ... 180 ... -150 ... 180°C
Heating/cooling rates	20 K/min
Atmosphere	Nitrogen at 20 ml/min
Sample mass	10.36 mg
Crucible	Al, pierced lid

Results

The DSC curves of both heatings show a melting peak at 137°C - 138.6°C. It is related to the crystallization peak at 108.2°C of the cooling (blue curve). In the second heating (red curve), a glass transition was detected at -123.9°C (midpoint) with a change in heat capacity of only 0.05 J/(g*K).