# TMA 402 *****F3******Hyperion*® Polymer Edition

## Thermomechanical Analysis – TMA - Tailor-Made for Low-Temperature Applications

### **TMA Analysis for Polymers**

Polymers undergo changes in their thermomechanical properties during heating and cooling. TMA analyses can give insights into molecular orientation and quenching effects during cooling. It allows the design of adhesives and other hybrid joints and quality control of shrink films. TMA analyses can hereby provide valuable insight into the composition, structure, production conditions or application possibilities for various materials.

### **Determination of Viscoelastic Properties like Relaxation, Creep and Stress/Strain**

The TMA 402 **F3** Hyperion® Polymer Edition now offers not only to keep the force constant and to measure the length change, but also to change the displacement and measure the corresponding force. This is for example used in a stress relaxation test. Here, a sample is stretched by a specific amount at a defined temperature. During the test, the deformation is kept constant and the progression of the force is recorded. This force continuously decreases as a result of material relaxation. Stress-relaxation is ultimately defined by the residual stress measured after a defined exposure period. The data can be depicted graphically in a stress-time diagram. It is then possible to read off both the stress-relaxation behavior and the values for the relaxation rate and time.

### **Mechanical Cooling to -70°C**

The TMA 402 **F3** Hyperion® Polymer Edition is specifically designed for polymer applications. It comes with a compact, highly reactive furnace capable of covering a temperature range  from -70°C to 450°C using a mechanical cooling system without the need for LN₂.