

## Dynamic Thermo-Mechanical Analysis (DTMA)



### Principle

Dynamic Thermo Mechanical Analysis (DTMA) is an analytical method to determine the thermo-mechanical properties of plastics under a dynamic load and during heating and cooling.

The tests provide a modulus of elasticity (or storage modulus  $G'$ ), a loss modulus  $G''$  and a dampening modulus (Tan Delta) in function of frequency and time.

DTMA allows to detect very small transitions that cannot be detected by DSC.

### Method

A standardised sample is installed between movable and fixed clamps.

3 possibilities:

- Single or Dual Cantilever clamp
- 3-point bending
- Tension mode

By means of the mobile clamp a well-defined oscillation is introduced into the sample, raising the temperature step by step.

### Applications

Determination of:

- glass transition
- transition stages in plastics
- creep and relaxation behaviour at different temperatures

In function of the temperature, frequency and tension, the following data are measured:

- E-modulus ( $E'$  – Storage modulus)
- Viscosity modulus ( $E''$  – Loss modulus)
- Dampening modulus (Tan delta)