

## MECHANICAL CHARACTERIZATION

### Dynamic Mechanical Analyser (DMA)

#### TA Instruments RSA-G2

RSA-G2 is an advanced platform for mechanical analysis of solids. It is capable of applying a variety of deformation types and collect material parameters, providing a wealth of information about material performance characteristics.

The RSA-G2 imposes a mechanical deformation to a specimen and measures the resulting stress response.

Thanks to its advanced design, characterized by separated motor and transducer, the instrument provides very accurate measurements of stress and strain.

The RSA-G2 features a variety of sample clamps that provide multiple modes of deformation.

The instrument is provided by a convection oven for precise and accurate temperature control that allows to perform:

- Test at room temperature
- Test at isothermal temperature
- Test in temperature ramp
- Test in air or in inert atmosphere, as argon or nitrogen gas

It is possible to characterize different materials, plastics or metals, performing tailor-made tests to investigate mechanical properties and simulate the exercise conditions.

#### Materials

##### Plastic and Rubber

- Rigid plastics
- Flexible plastics
- Elastomers
- Fibre
- Films

##### Metals

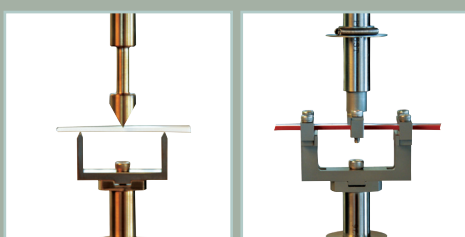
- Thin metallic samples
- Flexible samples
- Metallic foils

## Specifications

- Minimum force  
0.0005 N
- Maximum force  
35 N
- Force resolution  
0.00001 N
- Dynamic displacement  
 $\pm 0.000005$  to  $\pm 1.5$  mm
- Displacement resolution  
1 nm
- Modulus range  
 $10^3$  to  $3 \cdot 10^{12}$  Pa
- Modulus precision  
 $\pm 1\%$
- Frequency range  
 $2 \cdot 10^{-5}$  to 100 Hz
- Temperature range  
Room temperature to 500° C
- Heating/Cooling rate  
0.1 to 60°C/min
- Isothermal stability  
 $\pm 0.1^\circ\text{C}$

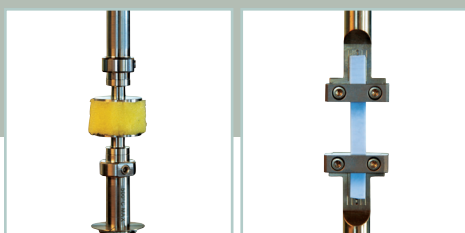
## Investigated properties

- Modulus of Elasticity
- Complex Modulus
- Storage and Loss Moduli
- Damping properties
- Compliance
- Frequency effects
- Creep and recovery
- Stress Relaxation
- Temperature-time superposition
- Glass transition
- Orientation effects
- Stress-Strain curves
- Dynamic Fatigue
- Toughness
- Viscoelasticity of materials
- Thermal transitions



BENDING

DUAL AND SINGLE  
CANTILEVER



COMPRESSION

TRACTION

