

THERMOMECHANICAL ANALYSIS

MANUFACTURER : TA Instruments

MODEL : Q400

Specifications

- Temperature range (max): -150 to 1000°C
- Temperature precision: ± 1 °C
- Furnace cool down time (air cooling): <10 min from 600°C to 50°C
- Maximum sample size - solid: 26 mm (L) X 10 mm (D)
- Maximum sample size - film/fiber: 26 mm (L) X 1.0 mm (T) X 4.7 mm (W) (static operation) and 26 mm (L) X 0.35 mm (T) X 4.7 mm (W) (dynamic operation)
- Measurement precision: $\pm 0.1\%$
- Sensitivity: 15 nm
- Displacement resolution: <0.5 nm
- Dynamic baseline drift: <1 μ m (-100 to 500°C)
- Force range: 0.001 to 2 N
- Force resolution: 0.001 N
- Frequency range: 0.01 to 2 Hz
- Atmosphere (static or controlled flow): inert, oxidizing or reactive gases
- Operational modes: standard, stress/strain, creep, stress relaxation, dynamic TMA (DTMA), modulated temperature TMA (MTMA)
- Deformation modes: compression (expansion, macro-expansion, penetration), 3-point bending, tension

Applications

- Measure sample dimensional changes under conditions of controlled temperature, time, force and atmosphere
- Resolve overlapping thermal events and characterize viscoelastic properties of sample under transient (stress/strain), dynamic and modulated temperature

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Example

TMA curve for a cured epoxy thermoset

