

Thermo Mechanical Analyzer
TMA7000 SERIES

HITACHI
Inspire the Next

TMA7000 SERIES

The New World in TMA

High Sensitivity – Great Flexibility

- New technology for measurement optimization
- Low noise, high sensitivity TMA signal
- Wide measurement range ($\pm 5\text{mm}$)
- Stress-Strain, Creep, Stress-Relaxation and DMA Measurements

The New Cooling Systems

- The integrated LN₂ gas control unit guarantees cooling efficiency
- The electrical cooling unit helps to reduce running costs

Automatic Gas Control Unit

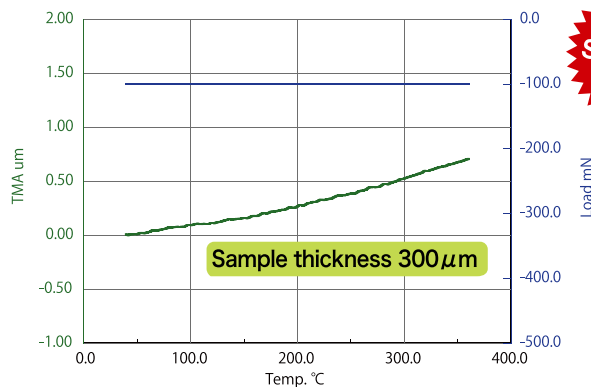
- Mass flow controllers for precise flow control

System Expandability

- The optional Cooling Systems, Humidity Control Furnace, Swelling Measurement, Vacuum Measurement and High Volume TG Measurement Accessory allow configurations for all application needs



Thermo Mechanical Analyzer



High Sensitivity

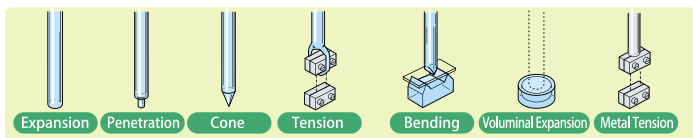
Measurement of thin glass plate

Dramatically improves basic performance

- Our newly developed optimization technology minimizes the noise level of the TMA signal and doubles sensitivity.
- Optimized to measure minor changes of low-expansion material and thin films.

Designed to meet all Application needs

- Wide dynamic ranges: Measurement range ± 5 mm Load range ± 5.8 N Maximum sample size 10mm diameter and 25mm length.
- Stress-Strain, Creep, Stress-Relaxation, and DMA measurements increase the value of use above the conventional TMA measurements such as thermal expansion, glass transition and softening.
- The complete range of measurement probes covers all application needs



Complete Cooling Unit

- The **LN₂ Dewar Vessel** attached to the furnace can easily perform measurements from -170°C.
- The powerful **Auto LN₂ Gas Cooling Unit** uses the cold nitrogen gas to allow heating and cooling in the temperature range from -150°C to 600°C automatically. New furnace design and improved control electronics increase cooling efficiency by more than 30%.
- High performance, easy handling and minimal running costs are the key features of the unique **Electrical Cooling Unit** in the temperature range of -60°C to 450°C.
- The **Auto Air Cooling Unit** uses compressed air to cool the furnace automatically down to room temperature after measurement to improve sample throughput.



Auto LN₂ Gas Cooling Unit



Electrical Cooling Unit

Model name	TMA7100	TMA7300
Temperature range	-170 to 600°C	Ambient to 1500°C
Sample cylinder	Quartz, Metal*	Alumina
Probe	Quartz Expansion Probe Quartz Cone Probe* Quartz Bending Probe* Volume Expansion Accessory*	Quartz Penetration Probe* Quartz Tension Probe* Metal Tension Probe*
Probe supporting method		Alumina Expansion Probe
Measurement range		Cantilever
RMS noise / sensitivity		± 5 mm
Load range / Resolution		0.005 μ m / 0.01 μ m
Scanning rates		± 5.8 N / 9.8 μ N
Maximum sample dimensions	Expansion, Penetration: 10(ϕ) \times 25(L) mm Tension: 5(W) \times 1(T) \times 25(L) mm	0.01 to 100°C /min
Sample length		Expansion: 10(ϕ) \times 25(L) mm
Atmosphere	Air, Inert gas Swelling measurement*	Vacuum (to 1.3Pa)* Humidity control measurement*
Stress control mode		Automated measurement
Strain control mode		Air, Inert gas Vacuum (to 1.3Pa)*
Gas purge control		Constant: ± 5.8 N, Constant rate loading: 9.8×10^{-2} to 9.8×10^6 mN/min, Sinusoidal loading: 0.001 to 1 Hz, Combination: maximum 40steps
Cooling unit	LN ₂ Dewar Vessel Electrical Cooling Unit*	Constant: ± 5000 μ m, Constant rate strain control: 0.01 to 10 ⁶ μ m/min Sinusoidal strain Control: 0.001 to 1Hz, Combination: maximum 40steps
Dimensions		Flow Meter* Gas Controller* Mass Flow Controller*
		Auto LN ₂ Gas Cooling Unit* Auto Air Cooling Unit*
		Auto Air Cooling Unit*
		390(W) \times 550(D) \times 740(H) mm

* optional

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