

Thermo Mechanical Analyzer / Stress Strain

EXSTAR TMA/SS7000
SERIES

Thermo
Mechanical
Analyzer
Stress
Strain



The New World in TMA/SS

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

Automatic Gas Control Unit*

- Mass flow controllers for precise flow control

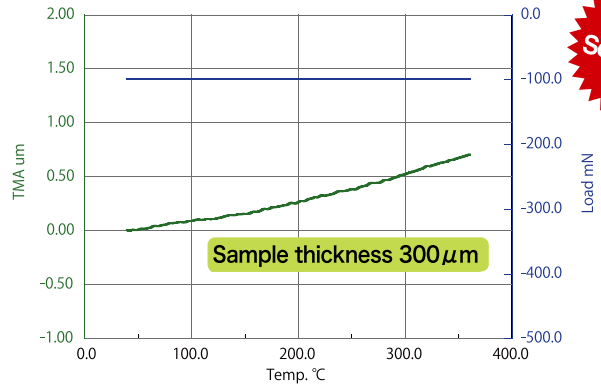
The New Cooling Systems*

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

System Expandability*

- The optional Cooling Systems, Swelling Measurement, Humidity Control and High Mass, High Volume TGA allow configurations for all application needs

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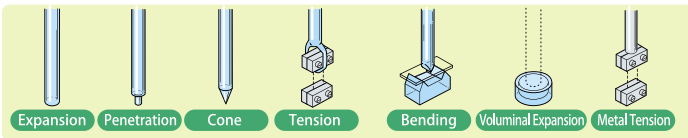
Measurement of thin glass plate

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 $\pm 5\text{mm}$; Load range $\pm 5.8\text{N}$; 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	TMA/SS7100	TMA/SS7300
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*
Alumina Expansion Probe		
Probe supporting method	Cantilever	
Measurement range	$\pm 5\text{mm}$	
RMS noise / sensitivity	0.005 μm / 0.01 μm	
Load range / Resolution	$\pm 5.8\text{ N}$ / 9.8 μN	
Scanning rates	0.01 to 100°C / min	
Maximum sample dimensions	Expansion, Penetration: 10(ϕ) \times 25(L) mm Tension: 5(W) \times 1(T) \times 25(L) mm	Expansion: 10(ϕ) \times 25(L) mm
Sample length	Automated measurement	
Atmosphere	Air, Inert gas Swelling measurement* Vacuum (to 1.3Pa)* Humidity control measurement*	Air, Inert gas Vacuum (to 1.3Pa)*
Stress control mode	Constant: $\pm 5.8\text{N}$, Constant rate loading: 9.8×10^{-2} to 9.8×10^6 mN/min, Sinusoidal loading: 0.001 to 1 Hz, Combination: maximum 40steps	
Strain control mode	Constant: $\pm 5000\ \mu\text{m}$, Constant rate strain control: 0.01 to $10^6\ \mu\text{m}/\text{min}$ Sinusoidal strain Control: 0.001 to 1Hz, Combination: maximum 40steps	
Gas purge control	Flow Meter* Gas Controller* Mass Flow Controller*	
Cooling unit	LN ₂ Dewar Vessel Electrical Cooling Unit*	Auto LN ₂ Gas Cooling Unit* Auto Air Cooling Unit*
Dimensions	390(W) \times 550(D) \times 740(H) mm	

* optional

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