SHIMADZU
Excellence in Science

Thermomechanical Analyzer

TMA-60 Series

This instrument varies the sample temperature in accordance with a program, and the changes in the sample dimensions are measured while applying a constant pressure to the sample during this process.

Melting	Glass transition	Crystallization	Hardening Polymerization Reaction	Sublimation Evaporation Dehydration	Thermal decomposition	Thermal expansion Thermal contraction	Investigation of thermal history	Specific heat

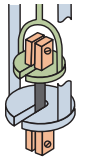
Two Available Analyzers — Select in Accordance with the Measurement

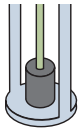
TMA-60
Total expansion

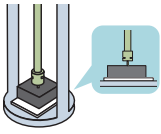
Simple to use for a variety of measurements

With the TMA-60, three types of measurement can be performed tension measurement, expansion measurement, and penetration measurement.
The sample support tube and the detection probe can be attached and removed with one touch, so the instrument can be used for diverse forms of measurement, and it can be maintained with ease.

Tension measurement | Expansion measurement | Penetration measurement





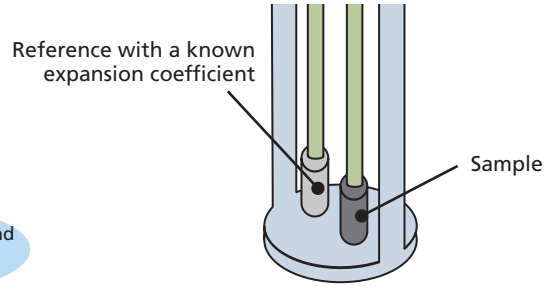


Can be attached and removed by the customer

TMA-60H
Differential expansion

Can be used for low expansion measurements

With the TMA-60H, differential expansion measurement can be carried out using a reference with a known expansion coefficient, enabling higher accuracy measurement.



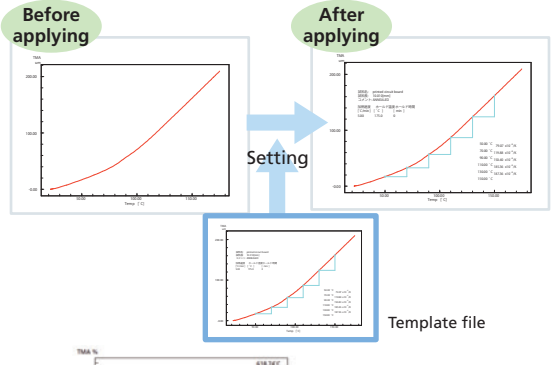
Loading modes that can be selected

Constant loading rate mode	Constant extension rate mode	Shrinkage stress mode
Load is varied at a constant rate	Extension is varied at a constant rate	Load is generated while maintaining a constant displacement
Measurement of expansion coefficient		Measurement of shrinkage stress

For More Comfortable Day-to-Day Measurement Work

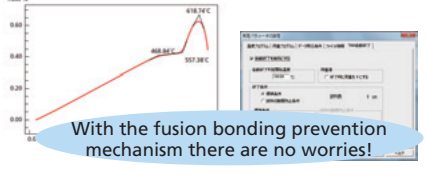
Automatic analysis using the "Template Function"

Corrections, analysis, and layout setting of reports can be carried out automatically using the unique "Template Function."
This can be used not only during analysis, but also prior to measurement. It will be automatically applied when measurement is completed, and saved.



Fusion bonding prevention mechanism

A safety mechanism is provided to prevent fusion bonding between the measurement rod and the sample when materials such as glass are heated. When the displacement exceeds a set range due to melting of the sample, the analysis is immediately stopped, and the load is removed from the sample.

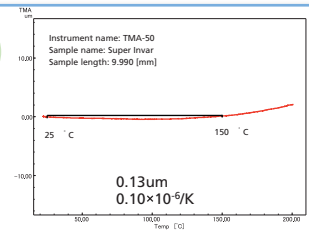


Can be Used for a Wide Range of Measurements

High accuracy measurement of low expansion materials

A new high-accuracy low-drift displacement sensor has been adopted, dramatically improving measurement accuracy.
Even the low expansion metal Super Invar can be measured.

Supports this measurement



Measurement of thermal expansion of low expansion metals

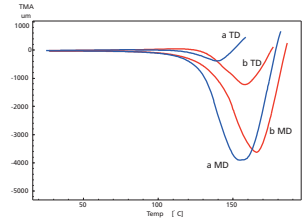
Large changes can be measured over a wide dynamic range

Measurement can be carried out over a wide span of ±5 mm, with high-accuracy measurement from very small to large deformation.
Samples with large deformation, such as separators in lithium ion batteries, can be measured.

Film shrinkage stress can be measured

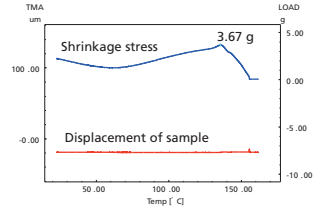
Shrinkage stresses can be measured with high sensitivity and high controllability.

Supports this measurement



Measurement of Li ion battery separators

Supports this measurement



Measurement of film shrinkage stress

Compact Design

We have achieved a compact design with a small footprint (W367 mm, D624 mm).

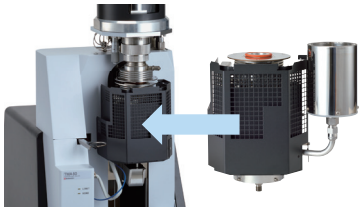
Example of System Configuration

For measurement below room temperature

Cooling Options

Cooling furnace LTB-60

- Enables TMA measurement over the temperature range of -150 to 500 °C
- Uses liquid nitrogen
- Use after manually pouring liquid nitrogen

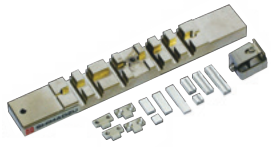


The cooling furnace LTB-60 can be used in place of the normal heating furnace

Optional Accessories

Tension chuck for fiber

Used for tension measurement of samples in fiber form.



Sample punch for TMA

(P/N: 222-12875-91 4×10 mm)
(P/N: 222-12875-92 4×15 mm)
(P/N: 222-12875-93 4×20 mm)

Used to cut out film samples for tensile measurement with TMA.

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