



# TMA 800

*Thermomechanical Analyzer*

## Description

The **TMA 800** is based on the proven vertical performance design utilizing a Oil Float Suspension System. Focusing on the stability needed for solid performance for coefficient of thermal expansion and other thermomechanical tests. The TMA 800 is capable of giving excellent data on a diverse range of materials. Operating over a wide temperature and under a range of modes to provide superior performance.

A main source of mechanical stress and failure in electronics components and other products is thermal expansion. Determining the precise glass-transition temperature where materials begin to soften and stress relief effects can begin to occur, or the point at which delamination can happen, are critical factors affecting the performance of electronics. The new **TMA 800** is a simple, easy-to-use, rugged Thermomechanical Analyzer that is ideal for measuring expansion of small components and low expansion rates of circuit boards, component materials, and much more.

The TMA is a perfect solution for determining coefficients of expansion accurately and efficiently. The rugged, all-metal furnace is designed to deliver thousands of hours of safe, failure free operation at temperatures ranging from -90 °C to 800 °C. The motorized furnace lift provides smooth, precise furnace repositioning after loading, and it is linked with position sensors to ensure safe operation. And its height-to-width aspect ratio enables accurate measurements of any size sample from a few microns to a centimeter tall or more.

## The Difference

While most TMA units on the market use a U-shaped geometry as a convenience feature, this can result in friction in the system, uneven force application, noise and sample deformation. Our direct, vertical inline system has the lowest friction and provides the best results.

When a sample is softening, you want to control the force that comes in contact with it. Even noise from the force motor can result in penetration into or deformation of the sample. That is the advantage of our Oil Float Suspension System a feature unique to the TMA 800. The float suspension fully supports the weight of the probe and force coil, so you apply just the amount of force required. Plus, it acts to dampen any vibration in the environment and your sample.

Interchangeable probes allow you to switch quickly between expansion, flexure, and various penetration probes all of which can be used with industry-standard test methods. An extension accessory includes a tool for convenient mounting of delicate films and fibers.



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The TMA is fully computerized with most functions under keyboard control. The temperature sensor is precalibrated to give precise temperature readout, while calibrations to improve accuracy under difficult sampling or fast-scanning conditions are simple to follow. Plus, you get software-enabled realtime data display, automatic zero and reading of sample height, curve optimization, comparison, and calculation; program archiving; and much more.

The TMA is an outstanding solution for labs needing to inexpensively meet regulatory requirements for thermal expansion in the electronics and other sensitive industries.

Here are just a few ways the system is optimized for thermal analysis:

- The cold sink's surface is cooled by a heat exchanger that allows a chiller to be attached by a single bolt.
- The furnace is 40 mm high, providing an extremely wide uniform temperature zone.
- Linear variable differential transformer (LVDT) position sensor provides sensitivity to small changes and the ability to track large-dimensional changes.
- The submerged float supports the weight of the sample probe and core rod, plus dampens noise all while protecting your quartz ware.
- Core rod and probe are fully supported by our unique oil float suspension system

### Key Benefits

- Accurate Coefficients of Thermal Expansion
- Sensitive Detection of Transitions
- Simplicity of Operation

### Specifications

Thermocouple Type Type K Nickel-Chromel

Temperature Range 0 °C to 800 °C

Temperature Accuracy 1 °C

Temperature Precision 1 °C

Cooling options: Chiller, running water

Testing Geometries: Expansion, Tensile, Penetration, 3 Point Bending, Compression, Dilatometer

Probe control: Oil float System and Electronic Force

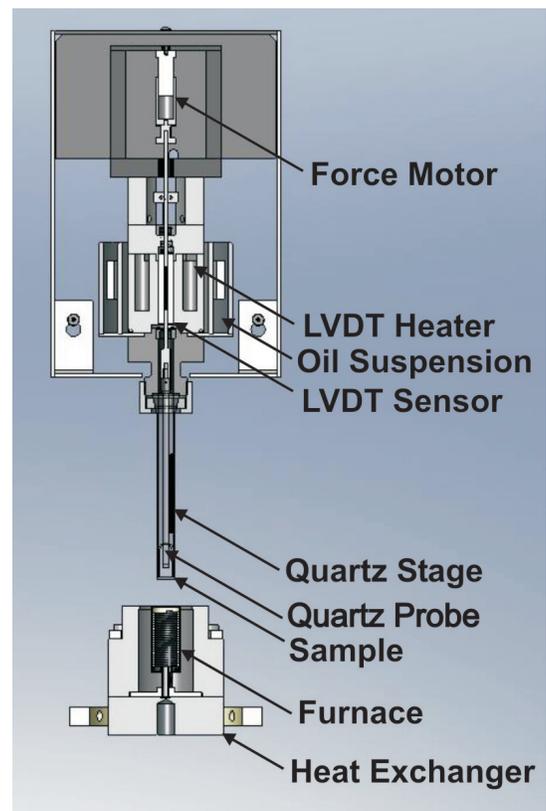
Maximum Load 2 N

Force Resolution .1 mN

Force Reproducibility .1 mN

Probe Type: Fused quartz

Probe Movement 12 mm



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