

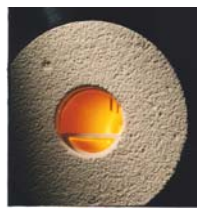
Orton Thermoanalytical Instruments are used to measure the changes in material properties when they are heated or cooled. Orton instruments are designed specifically for high temperature raw materials and finished products such as ceramics, glass, refractories, metals, and composites. Orton instruments are used in QC and R&D applications.

Dilatometers - Thermodilatometric Analysis (TDA)

Orton dilatometers are designed to measure the dimensional changes of ceramics, glasses, metals, carbon composites, cermets, minerals, and polymers as a function of temperature for R&D, QC, and educational applications. The dilatometer records reversible and irreversible changes in length (expansion and shrinkage) during heating and cooling. Samples are measured for determining firing ranges and firing schedules, measuring thermal expansion ranges for glaze fits, and measuring thermal expansion ranges for R&D, QC or product certification. Orton standard dilatometers are used for various ASTM testing procedures to measure the Coefficient of Thermal Expansion (CTE), softening point, glass transition temperature, curie point, crystalline transformation, phase transition, shrinkage, warping, bloating, sintering rate, isothermal creep, stress relaxation. Standard dilatometers are made for various temperature ranges from -150°C to 1,600°C.



Thermal Reaction Studies – Gradient Furnace



The Orton Gradient Furnace is the most **POWERFUL**, most **COST EFFECTIVE** laboratory instrument for studying the **REACTIONS** of a material as a function of a temperature range. After **ONE** firing, you can study the effects of a temperature range on properties such as shrinkage, sintering, density, porosity, absorption, surface area, color, degree of crystallization, phase development, electrical properties, magnetic properties, and others. In **ONE FIRING**, the Orton Gradient



Furnace prepares a range of samples with known thermal histories for measuring and studying the effects of temperature on reactions and physical properties. Orton Gradient Furnaces are made for operation between room temperature and 1,600°C.

Glass Testing Instruments

Glass manufacturers, researchers, and technologists are interested in specific temperature points, such as the softening point, annealing point, strain point, liquidus point, transition temperature, and are also interested in various temperature ranges of viscosities. Orton manufactures eight instruments designed for determining specific temperature points, specific temperature / viscosity ranges, liquidus temperatures, and thermal expansion data. The graph to the right is a viscosity versus temperature curve for a standard glass composition and shows the various points and ranges of interest.

