MATERIALS RESEARCH FACILITY

UK Atomic Energy Authority

Linseis L75V PT: Dilatometer

The Dilatometer is used to measure the thermal expansion of materials as a function of temperature.

A controlled atmosphere furnace heats or cools a sample to a target temperature whilst a push-rod transfers the vertical expansion of the sample into a high resolution strain gauge.

From this the relative increase in length and the coefficient of thermal expansion (CTE) can be calculated.

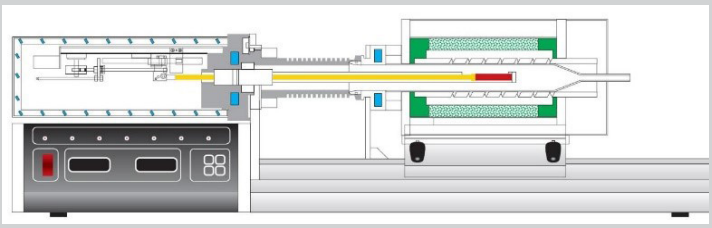
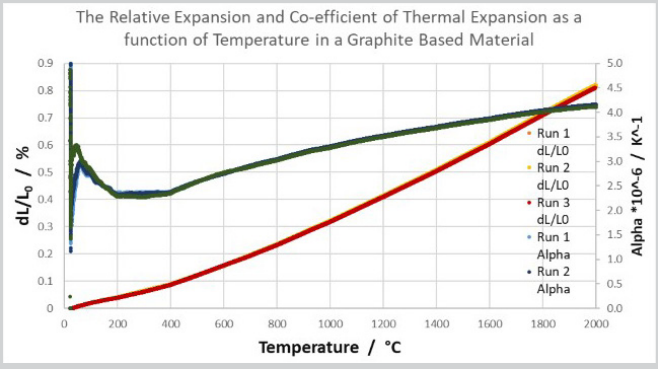


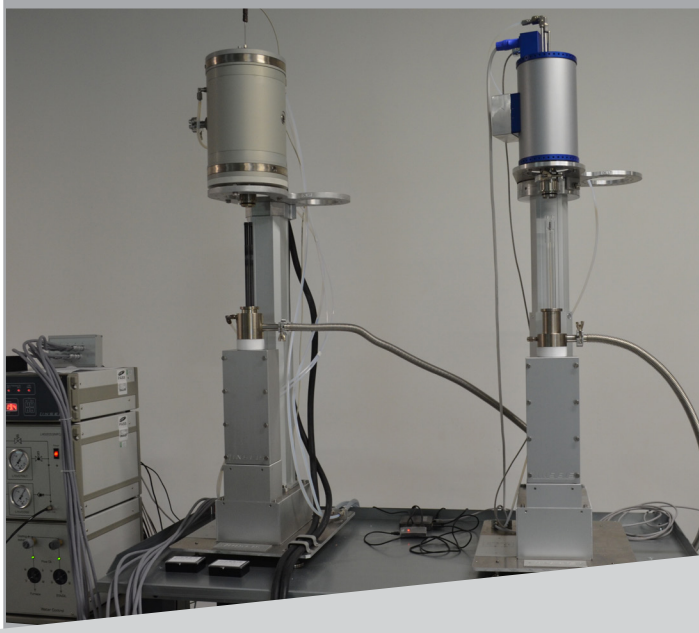
Diagram of the Dilatometer with key components highlighted: sample position in red, push-rod in yellow and furnace in green.



Expansion of a graphite based material heated up to 2000°C at 15°C/min with 3 repeats. Also shown is the value for the coefficient of thermal expansion, α, derived for the three runs as a function of temperature.

TECHNICAL SPECIFICATIONS

- High temperature furnace: RT to 2000°C
- Low temperature furnace: -150°C to 500°C
- Vertical push-rods for minimal friction on expansion and guaranteed push-rod contact
- Measurement range: ±2.5mm, resolution: 0.03nm
- Variable force contact rods
- Dual push-rod setup for either higher through-put or direct reference measurement
- Choice of atmosphere: Inert / Oxidising / Reducing / Vacuum
- CTE accuracy: ±0.5%
- Max data acquisition rate: 2MHz
- Temperature accuracy: ±0.5°C or 0.25%
- Standard: ASTM E831 / ASTM D696



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