

NPL In-house Designed High-Temperature Guarded Hot-Plate

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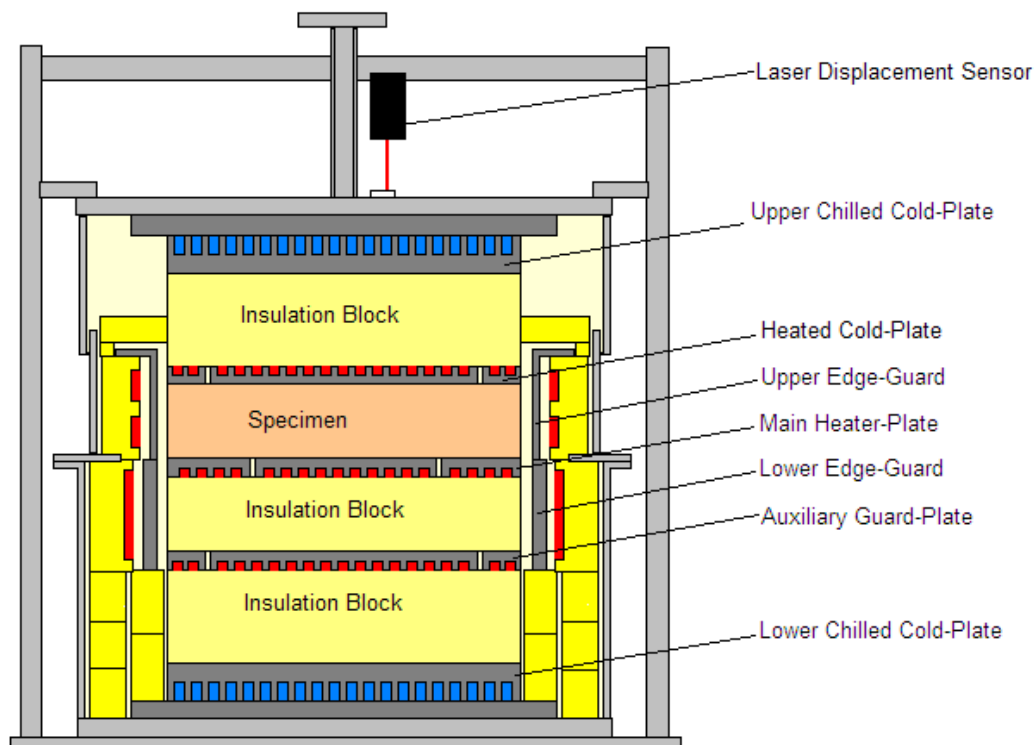
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EMRP SIB52 Thermo Stakeholder Meeting



Conforms to ISO 8302:1991, EN 12667:2001 and prEN/TS 15548-1:2011

- Single specimen
Ø305 mm × (25 mm to 60 mm)
- T: 140 °C to 800 °C
- λ : 0.02 Wm⁻¹K⁻¹ to 0.5 Wm⁻¹K⁻¹
- ΔT : 50 K
- Static lower module with sealed bottom
- Movable upper module, telescopic
- Central stack
- Lateral Guarded heater-plates
- Gaps filled with insulation
- Lower edge-guard
- Auxiliary guard-plate
- Upper edge-guard
- Static pressure load 3.7 kPa
- Laser displacement sensor for in-situ thickness measurement
- Overall uncertainty: 4% (k=2)

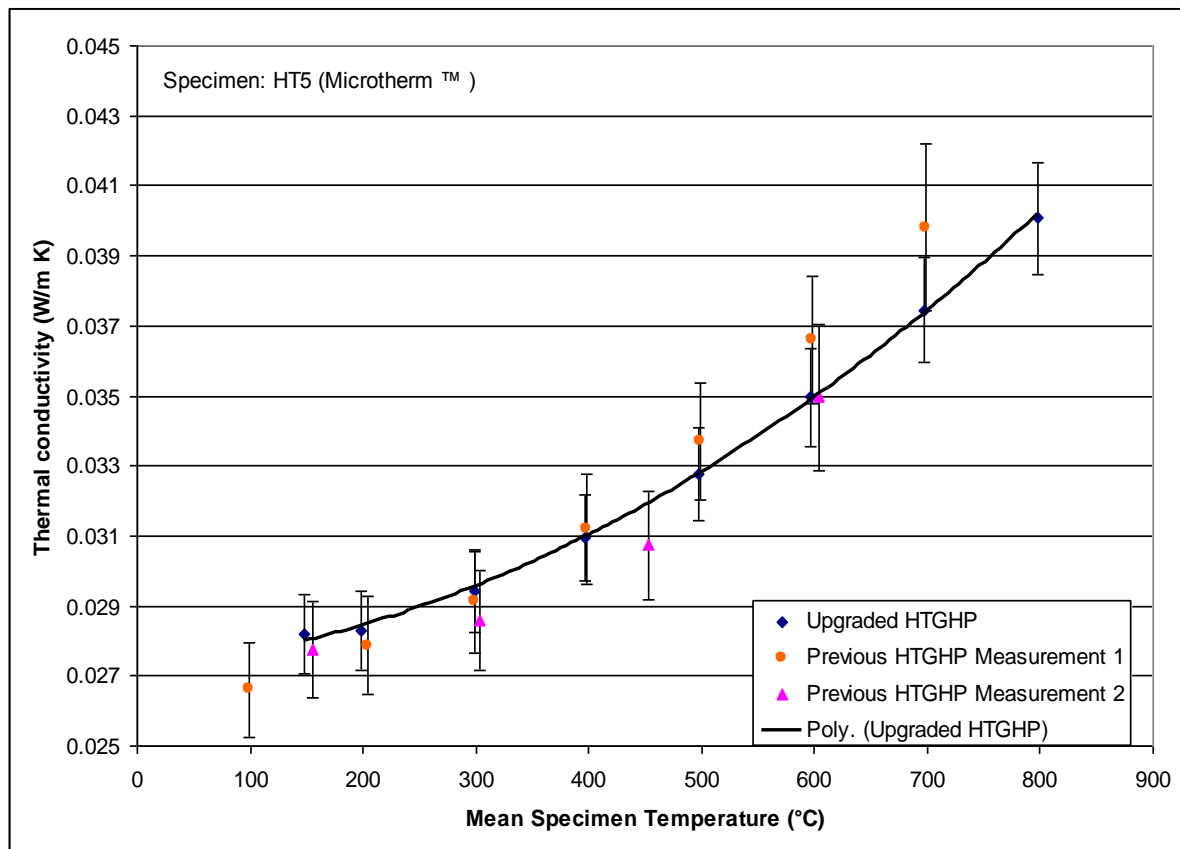


- Dimensions:
 - Overall lateral : \varnothing 305 mm
 - Metering area : \varnothing 150.0 mm
 - Centre/Guard gap width: 2.0 mm filled with alumina cement
- Plates:
 - 10 mm thick Nickel 201 alloy plates
 - High temperature black paint, HE23, surface emissivity ≥ 0.8
 - Metering area corrected for expansion
- Thermocouples:
 - Type N, MIMS \varnothing 1mm, bare-wire for differential
 - 12-way centre/guard differential (24 junctions) on main heater-plate
 - 4-way centre/guard differential on heated cold-plate
- Heaters:
 - Mineral insulated Inconel sheathed cable heater
 - Optimal heater location



Note: Before being painted with HE23

- Temperature uniformity on the main heater-plate: ± 0.55 K.
- Measurement uncertainty improved to ± 4 % (k=2).



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