LABORATORY OF THERMAL ENGINEERING

The Laboratory of Thermal Engineering provides support to the design and tests of prototypes of thermal devices and components. It consists of specialized equipment for the determination of relevant thermophysical properties for the characterization of the thermal behavior of materials in solid and liquid phase, as well as Phase Change Materials, PCM.

Contact

Ana Lázaro (ana.lazaro@unizar.es)

Mónica Delgado (monica@unizar.es)

GITSE Thermal Engineering and Energetic Systems Group

instituto de investigación en ingeniería de Aragón Universidad de Zaragoza

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EQUIPMENT FOR DETERMINATION OF THERMOFISICAL PROPERTIES

Property	Method	Accuracy	Sample mass	Temperature range	Organic / inorganic	Solid / liquid	Composite materials
Enthalpy	T-History	<10%	~10 g.	-10ºC-50ºC	Both	Both, solidification and melting	Yes
Phase change temperature range and determination of supercooling and hysteresis	T-History	0.2 K	~10 g.	-10ºC-50ºC	Both		Yes
Thermal diffusivity	Energy balance	<10%	15 cm x 12 cm	10ºC-40ºC	Both	Both, with encapsulation	Yes
Thermal power exchange with the air	Energy balance	5%	~1 kg, 38cm x 14 cm	10ºC-40ºC	Both	Both, with encapsulation	Yes
Specific heat	DSC	0.1K / <1%	~20mg.	-100ºC-600ºC	Both	Both	Only if sample mass is adequate
Thermal diffusivity	LFA	Sol. <0.37%	12.7 mm diameter, 2mm de thickness	Ambient-1100ºC (diffusivities range de: 0.01-1000 mm^2/s)	Both	Both	Only if sample mass is adequate
		Liq. <1.6%					
Thermal conductivity	LFA-DSC	Sol. <1%		Ambient-600ºC	Both	Both	Only if sample mass is adequate
		Liq. <1%					
Viscosity	Rheometer	Torque resolution 0.1 nN· m; Displacement resolution 2.5·10-8 rad	0.5 ml - 30 ml	-150-600ºC	Both	Both	No
Density / Volumetric expansion	Densimeter/TMA	Densimeter: <1% TMA:<1nm	Densimeter: >1ml TMA: 20mm	-150ºC-600ºC	Booth	Densimeter: Liquid TMA: Both	Yes

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