

Laser Flash Apparatus (LFA)



Manufacturer: NETZSCH Instruments North America, LLC

Model: LFA467 Hyperflash

Application: For the measurement of thermal diffusivity

Technical Data:

Temperature range	RT up to 500 °C
Heating rate (max.)	50 K/min (Steel furnace)
Cooling devices	CC 200 F3 (liquid nitrogen cooling): -100 °C to 500 °C, software controlled
	CC 300 (liquid nitrogen cooling): -100 °C to 500 °C; optionally with liquid nitrogen refilling, software controlled, level monitoring
Thermal diffusivity	0.01 mm ² /s up to 1000 mm ² /s
Thermal conductivity	0.1 W/(m·K) up to 2000 W/(m·K)
Accuracy	Thermal diffusivity: ± 3 % Specific heat: ± 5 %

Repeatability	Thermal diffusivity: $\pm 2 \%$ Specific heat: $\pm 3 \%$
Xenon flash lamp	Software-controlled, variable Pulse width: 20 up to 1200 μs
ZoomOptics	Optimized field of view
Pulse mapping	Patented pulse mapping (US7038209, US20040079886, DE 10242741), for finite pulse correction and improved cp-determination
IR detector	- InSb: RT up to 500 °C - MCT (Hg-Cd-Te): -100 °C to 500 °C Detector is equipped with a 0,5-litre Dewar, Operating time (manufacturer's specification) up to 24 h
Atmosphere	Inert, oxidizing, static und dynamic
Data acquisition	2 MHz Up to 40.000 measuring points; for detector and pulse signal each
Gas control	MFC (2x purge gas, 1x protective gas), internal pump for AutoVac
Integrated automatic sample changer	4 inserts for up to 16 samples (4 x \varnothing max. 25.4 mm, 16 x \varnothing max. 12.7 mm, round or square)
Sample Holders	For special applications such as molten polymers and low viscosity liquids, resins during curing, pastes, powders, fibers, laminates, inplane tests or tests under mechanical pressure
Line voltage	230 V / 115 V; 50 Hz / 60 Hz; max. 1150 VA (measuring unit)
Vacuum	< 150 mbar
Location requirements	Closed room (laboratory) Ambient temperature 20 °C +/- 5 °C Relative humidity 60% +/- 20% Atmospheric pressure 1013 hPa +/- 30 hPa or max. 2000 m Distance to wall min. 30 cm
Data acquisition	2 MHz Min. measurement time (10 half times) down to 1 ms → for highly conducting and/or thin samples (e.g., Al, Cu plates, thin films, etc.) Max. measurement time up to 120 s → for low-conducting and/or thick samples (e.g., polymers, refractories, etc.)
Sample holders	For round samples

	For liquids, pastes, resins, powders, fibers, laminates, anisotropic samples For tests under mechanical pressure
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Sample Preparation:

Sample Diameter: 1 inch

Sample Thickness: It is important to use a sample with flat and parallel faces in order to record an accurate value for the sample thickness.

The optimum sample thickness depends on the diffusivity (α) of the material.

The table below indicates recommended thickness for different diffusivity values according to the material respectively to the templates used in the software.

Material / Template	Thermal diffusivity (mm ² /s)	Recommended thickness (mm)
low thermal diffusivity polymers	0.5	1 - 1.5
medium thermal diffusivity ceramics	5	1.5 - 2
high thermal diffusivity metals	50	2 - 3