

# Technical Specifications

# NETZSCH

	LFA 467 HyperFlash®	LFA 467 HT HyperFlash®
Temperature range	-100°C ... 500°C room temperature version available	RT ... 1250°C (furnace temperature 1500°C)
Heating rate (max.)	50 K/min	50 K/min
Furnace cooling device	External chiller (RT... 500°C), Optional: <ul style="list-style-type: none"> <li>▪ Liquid nitrogen cooling (-100 ... 500°C)</li> <li>▪ Pressurized air (0°C ... 500°C)</li> </ul>	External chiller
Thermal diffusivity	0.01 mm <sup>2</sup> /s ... 2000 mm <sup>2</sup> /s	0.01 mm <sup>2</sup> /s ... 2000 mm <sup>2</sup> /s
Thermal conductivity	0.1 W/(m·K) ... 4000 W/(m·K)	0.1 W/(m·K) ... 4000 W/(m·K)
Accuracy	<ul style="list-style-type: none"> <li>▪ Thermal diffusivity<sup>1</sup>: ± 3%</li> <li>▪ Specific heat<sup>2</sup>: ± 5%</li> </ul>	<ul style="list-style-type: none"> <li>▪ Thermal diffusivity<sup>1</sup>: ± 3%</li> <li>▪ Specific heat<sup>2</sup>: ± 5%</li> </ul>
Repeatability	<ul style="list-style-type: none"> <li>▪ Thermal diffusivity<sup>1</sup>: ± 2%</li> <li>▪ Specific heat capacity<sup>2</sup>: ± 3%</li> </ul>	<ul style="list-style-type: none"> <li>▪ Thermal diffusivity<sup>1</sup>: ± 2%</li> <li>▪ Specific heat capacity<sup>2</sup>: ± 3%</li> </ul>
Xenon flash lamp	<ul style="list-style-type: none"> <li>▪ Pulse energy<sup>3</sup>: up to 10 Joules/pulse (variable), software-controlled</li> <li>▪ Pulse width<sup>4</sup>: 10 to 1500 µs</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pulse energy<sup>3</sup>: up to 10 Joules/pulse (variable), software-controlled</li> <li>▪ Pulse width<sup>4</sup>: 10 to 1500 µs</li> </ul>
ZoomOptics	Patented (EP2693205, DE102012106955); optimized field of view (optional, requires no mask)	Patented (EP2693205, DE102012106955); optimized field of view (optional, requires no mask)
Pulse mapping	Patented pulse mapping (US7038209, DE10242741), for finite pulse correction and improved $c_p$ determination	Patented pulse mapping (US7038209, DE10242741), for finite pulse correction and improved $c_p$ determination
IR detectors	<ul style="list-style-type: none"> <li>▪ InSb: RT ... 500°C</li> <li>▪ MCT: -100°C ... 500°C</li> <li>▪ Detector refill device (option)</li> </ul>	<ul style="list-style-type: none"> <li>▪ InSb: RT ... 1250°C</li> <li>▪ Detector refill device (option)</li> </ul>
Atmosphere	Inert, oxidizing, static and dynamic	Inert, oxidizing, static and dynamic
Vacuum	< 150 mbar	10 <sup>-4</sup> mbar (with turbo pump)
Data acquisition	2 MHz <ul style="list-style-type: none"> <li>▪ 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.)</li> <li>▪ Max. measurement time up to 120 s → for low-conducting and/or thick samples (e.g., polymers, refractories, etc.)</li> </ul>	2 MHz <ul style="list-style-type: none"> <li>▪ 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.)</li> <li>▪ Max. measurement time up to 120 s → for low-conducting and/or thick samples (e.g., polymers, refractories, etc.)</li> </ul>
Gas control	Frits or optional MFC; measurements under reduced pressure possible	MFC + internal pump
Sample holders	<ul style="list-style-type: none"> <li>▪ Round and square samples</li> <li>▪ Liquids, pastes, resins, powders, fibers, laminates, anisotropic samples</li> <li>▪ Tests under mechanical pressure</li> </ul>	<ul style="list-style-type: none"> <li>▪ Round and square samples</li> <li>▪ Liquids, pastes, resins, powders, lamellar samples</li> <li>▪ Tests under mechanical pressure</li> </ul>
Integrated automatic sample changer	4 insets for up to 4 samples each: <ul style="list-style-type: none"> <li>▪ 4x Ø<sub>max.</sub> 25.4 mm</li> <li>▪ 16x up to Ø<sub>max.</sub> 12.7 mm</li> <li>▪ 16x up to □<sub>max.</sub> 10 mm</li> </ul>	4 insets for 1 sample each: <ul style="list-style-type: none"> <li>▪ Ø 12.7 mm</li> <li>▪ □ 10 mm</li> <li>▪ Ø 10 mm</li> </ul>

1 Accuracy of thermal diffusivity amounts to ±1.5% and repeatability to ±1%, based on 900 tests on Cu (high diffusive) and Pyrex (low diffusive) specimens (dia. 12.7mm, thickness 2.0mm) with at least 3 different devices at room temperature.  
 2 Accuracy of the specific heat capacity amounts to ± 4% and repeatability to ±2% when using 4 different reference materials, 550 shots, averaging for 5 shots, RT, recommended dimension, recommended shot parameters.  
 3 Pulse energy limited to 10 J to prevent non-linearity effects due to sample overheating and a detector signal not proportional to the temperature changes. Combining lower pulse energy with high detector sensitivity ensures accurate results.  
 4 Adjustable in steps of 1 µs