

Technical Specifications

NETZSCH

Kinexus Prime DSR			
	DSR+	DSR	DSR-III
Rheometer Platform	Each system designed to meet the demanding needs of research, product development, comparative benchmarking, quality control and assurance required by the global asphalt / bitumen industry		
Motor control	Electronically Commutated (EC), drag cup motor control providing absolute direct: shear strain, shear rate, shear stress for operation in steady, dynamic, and transient loading modes		
Torque range – viscometry (rate and stress control) ¹⁾	5 nNm – 225 mNm	10 nNm – 200 mNm	100 nNm – 150 mNm
Torque range – oscillation (strain and stress control) ¹⁾	1 nNm – 225 mNm	5 nNm – 200 mNm	100 nNm – 150 mNm
Torque resolution	0.1 nNm	0.1 nNm	0.1 nNm
Position resolution	$< 1.8 \cdot 10^{-9}$ rad	$< 1.8 \cdot 10^{-9}$ rad	$< 1.8 \cdot 10^{-9}$ rad
Angular velocity range	1 nrad ^s ⁻¹ to 500 rad ^s ⁻¹	10 nrad ^s ⁻¹ to 325 rad ^s ⁻¹	10 nrad ^s ⁻¹ to 200 rad ^s ⁻¹
Step position control in strain control	< 10 ms	< 10 ms	< 10 ms
Frequency range	6.28 μrad ^s ⁻¹ to 942 rad ^s ⁻¹ (1 μHz to 150 Hz)	6.28 μrad ^s ⁻¹ to 628 rad ^s ⁻¹ (1 μHz to 100 Hz)	6.28 μrad ^s ⁻¹ to 628 rad ^s ⁻¹ (1 μHz to 100 Hz)
Motor inertia	12 μN.m.s ²	12 μN.m.s ²	12 μN.m.s ²
Normal force range	0.001 N – 50 N	0.001 N – 50 N	0.01 N – 20 N
Normal force resolution	0.5 mN	0.5 mN	0.5 mN
Normal force response time	<10 ms	<10 ms	<10 ms
Vertical lift speed	0.1 μm ^s ⁻¹ to 35 mm ^s ⁻¹	0.1 μm ^s ⁻¹ to 35 mm ^s ⁻¹	0.1 μm ^s ⁻¹ to 20 mm ^s ⁻¹
Vertical lift range (measurable)	230 mm	230 mm	230 mm
Gap resolution (over full vertical lift range)	0.1 μm	0.1 μm	0.1 μm
Fully configurable vertical profiles	By speed and by Normal Force		
Raw instrument variables	5 kHz constant streaming data		
Complete sample history	Data available from loading to unloading as standard		
Instrument interface	USB2 – plug and play		
Dimensions	D x W x H (weight): 485 mm x 490 mm x 680 mm (47 kg)		

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rSpace software	Sequence-driven user interface enabling Standard Operating Procedure (SOP)-type test functionality and fully customizable test designs		
General rheology	✓	✓	✓
rSolution applications database	✓	✓	✓
Rheology toolkit package	✓	✓	✓
Asphalt rheology	✓	✓	✓
Rheology analysis package	✓	✓	✓
Sequence design functionality	✓	✓	✓
Interactive materials database	✓	✓	✓

1) Note the relationship between shear stress, torque and measuring geometry.

NOTE: Specifications have been obtained under conditions as stated in the Installation and Site Requirements for Kinexus Prime rheometers

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Kinexus Prime DSR – Accessories			
Environmental Controllers*	DSR+	DSR	DSR-III
Asphalt Active Hood Oven			
Standard temperature range (optional)	-5°C to 150°C (-40°C to 180°C)	-5°C to 150°C (-40°C to 180°C)	-5°C to 150°C (-40°C to 180°C)
Heating rate (controlled)	30°C/minute	30°C/minute	30°C/minute
Temperature resolution	0.01°C	0.01°C	0.01°C
Temperature stability	Better than ± 0.1°C	Better than ± 0.1°C	Better than ± 0.1°C
Universal Cylinder Peltier			
Standard temperature range (optional)	0°C to 200°C (-25°C to 200°C)	0°C to 200°C (-25°C to 200°C)	0°C to 150°C (-25°C to 200°C)
Heating rate (controlled)	15°C/minute	15°C/minute	15°C/minute
Temperature resolution	0.01°C	0.01°C	0.01°C
Temperature stability	Better than ± 0.1°C	Better than ± 0.1°C	Better than ± 0.1°C
HTC Prime			
Temperature range	0°C** to 450°C	0°C** to 450°C	0°C** to 450°C
Max. heating rate	30 K/min	30 K/min	30 K/min
Max. cooling rate	15 K/min	15 K/min	15 K/min
Max. boost cooling rate	20 K/min	20 K/min	20 K/min

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Kinexus Prime DSR – Accessories				
Options Available*		DSR+	DSR	DSR-III
Quick-connect upper geometries	Plug and play; auto-recognition and configuration in software	✓	✓	✓
Disposable plates option	Upper and lower disposable plate options for curing materials	✓	✓	✓
Crumb rubber kit	C14/25 – CRM C25 cup & C14 bob for use with cylinder cartridge. Other cups, bobs and vanes available	✓	✓	✓
Solids Fixtures kit	Solid fixtures for use with cylinder cartridge for testing rectangular or cylindrical solids (Asphalt cores)	✓	✓	-
Plates and Cones diameter & angle	Standard diameters range from 4 mm to 60 mm Standard angles are 0.5°, 1°, 2° and 4° – others on request	✓	✓	✓
Asphalt Plate diameter	Asphalt 4 mm, 8 mm and 25 mm plates	✓	✓	✓
Tribology – friction	Ball Tribology kit based on ISO7148 design	✓	✓	-
Temperature Calibration Kit	Fully automated and integrated NIST traceable device for easy verification and calibration of system temperature	✓	✓	✓

* Additional Environmental controllers, accessories and geometries available upon request

** at 6 bar Vortex cooling air pressure (5 °C at 5.5 bar Vortex cooling air pressure)

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