

Technical Specifications



| Kinexus DSR | | | | |
|--|---|---|---|---|
| | DSR+ | DSR | DSR-E | 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) | 5 nNm – 225 mNm | 10 nNm – 200 mNm | 20 nNm – 200 mNm | 100 nNm – 150 mNm |
| Torque range – oscillation (strain and stress control) | 1 nNm – 225 mNm | 5 nNm – 200 mNm | 10 nNm – 200 mNm | 100 nNm – 150 mNm |
| Torque resolution | 0.1 nNm | 0.1 nNm | 0.1 nNm | 0.1 nNm |
| Position resolution | <10 nrad | <10 nrad | <10 nrad | <10 nrad |
| 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 325 rad ^s ⁻¹ | 10 nrad ^s ⁻¹ to 200 rad ^s ⁻¹ |
| Step change in strain | <10 ms | <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) | 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 | 13 μN.m.s ² | 13 μN.m.s ² |
| Normal force range | 0.001 N – 50 N | 0.001 N – 50 N | 0.01 N – 50 N | 0.01 N – 20 N |
| Normal force resolution | 0.5 mN | 0.5 mN | 0.5 mN | 0.5 mN |
| Normal force response time | <10 ms | <10 ms | <10 ms | <10 ms |
| Vertical lift speed | 0.1 μm ^s ⁻¹ to 35 mms ⁻¹ | 0.1 μm ^s ⁻¹ to 35 mms ⁻¹ | 0.1 μm ^s ⁻¹ to 35 mms ⁻¹ | 0.1 μm ^s ⁻¹ to 20 mms ⁻¹ |
| Vertical lift range (measurable) | 230 mm | 230 mm | 230 mm | 230 mm |
| Gap resolution (over full vertical lift range) | 0.1 μm | 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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|---------------------------------|--|------------------------|------------------|------------------|
| | DSR+ | DSR | DSR-E | DSR-III |
| rSpace software | Sequence-driven user interface enabling Standard Operating Procedure (SOP)-type test functionality and fully customizable test designs | | | |
| rSpace package | Comprehensive Rheology | Comprehensive Rheology | Complete Asphalt | Standard Asphalt |
| User access control | ✓ | ✓ | ✓ | ✓ |
| General rheology | ✓ | ✓ | - | - |
| rSolution applications database | ✓ | ✓ | - | - |
| Rheology toolkit package | ✓ | ✓ | ✓ | - |
| Asphalt rheology | ✓ | ✓ | ✓ | ✓ |
| Rheology analysis package | ✓ | ✓ | ✓ | ✓ |
| Sequence design functionality | ✓ | ✓ | ✓ | ✓ |
| Interactive materials database | ✓ | ✓ | ✓ | ✓ |

Technical Specifications



| Kinexus DSR – Accessories | | | | |
|---------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Environmental Controllers* | DSR+ | DSR | DSR-E | DSR-III |
| Asphalt Active Hood Oven | | | | |
| Standard temperature range (optional) | -5°C to 200°C (-40°C to 200°C) | -5°C to 150°C (-40°C to 200°C) | -5°C to 150°C (-40°C to 200°C) | -5°C to 150°C (-40°C to 200°C) |
| Heating rate (controlled) | 30°C/minute | 30°C/minute | 30°C/minute | 30°C/minute |
| Resolution | < 0.0005°C | < 0.0005°C | < 0.0005°C | < 0.0005°C |
| Stability | ± 0.003°C | ± 0.01°C | ± 0.01°C | ± 0.01°C |
| Gradients | < 0.1°C | < 0.1°C | < 0.1°C | < 0.1°C |
| Universal Cylinder Peltier | | | | |
| Standard temperature range (optional) | -5°C to 200°C (-30°C to 200°C) | -5°C to 200°C (-30°C to 200°C) | -5°C to 150°C (-30°C to 200°C) | 5°C to 150°C (-30°C to 200°C) |
| Heating rate (controlled) | 15°C/minute | 15°C/minute | 15°C/minute | 15°C/minute |
| Resolution | < 0.0005°C | < 0.0005°C | < 0.0005°C | < 0.0005°C |
| Stability | ± 0.003°C | ± 0.003°C | ± 0.003°C | ± 0.003°C |
| High Temperature (HTC) | | | | |
| Standard temperature range | RT to 350°C | RT to 350°C | RT to 350°C | RT to 350°C |
| Heating rate (controlled) | 50°C/minute | 50°C/minute | 50°C/minute | 50°C/minute |
| Resolution | < 0.0005°C | < 0.0005°C | < 0.0005°C | < 0.0005°C |
| Stability | ± 0.003°C | ± 0.003°C | ± 0.003°C | ± 0.003°C |

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| Kinexus DSR – Accessories | | | | | |
|-----------------------------------|--|------|-----|-------|---------|
| Options Available* | | DSR+ | DSR | DSR-E | 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

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