



Unsaturated Consolidation Testing (SDSWCC) (Unsat Rowe / Unsat CRS)

Overview: Whether using the Rowe and Barden type system or a CRS type system, the sample is contained within a circular, fixed diameter ring equipped with a high air-entry ceramic disc at its base. Vertical stress is applied through a loading frame (CRS) or using the upper chamber pressure (Rowe and Barden), and axial force is measured with a load cell or directly from the pressure in the upper chamber. Because the radial deformation is zero for the K_0 condition, the total volume change of the specimen is measured from the vertical displacement of the soil specimen. Using either of these apparatus, the volume change can be accurately measured and the stress-dependent soil-water characteristic curve (SDSWCC) can be determined.

Key Features:

Benefits to the User:

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|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Direct control of both Matric Suction and Axial Stress: | It is now generally accepted that unsaturated soil behaviour is governed by two independent stress state variables, i.e. net stress and matric suction (Fredlund and Morgenstern, 1977). |
| Axis translation technique: | Matric suction is controlled up to either 500kPa or 1500kPa (depending on the air entry value chosen) by controlling pore air and pore water pressure directly. |
| Fully controllable axial load/stress/displacement/strain: | The Stress Dependant Soil Water Characteristic Curve (SDSWCC) is possible due to the precise control over the axial stress. This poses an advantage over the traditional pressure plate extractor in which no external stress is applied and volume change of the soil specimen is assumed to be zero. |
| Fixed ring K_0 conditions: | K_0 conditions ensure there is no lateral deformation, therefore sample volume can be calculated directly from the axial deformation recorded. |
| Upgrade Options: | Both the Rowe and Barden and CRS type apparatus, even if first supplied for fully saturated testing only, can be upgraded to an unsaturated version at any time. |

Tests that can be Performed by CRS & Rowe Apparatus:

One dimensional consolidation, Constant rate of Loading (CRL), Constant rate of strain (CRS), Multi-stage Testing, Quasi-static low speed/creep tests, ramp and cycle pressure or volume change, saturation, Stepped loading, Matric suction control, Stress Dependant Soil Water Characteristic Curve (SDSWCC).

Technical Specification CRS cell:

| | |
|-------------------------------------------|-------------------------------------------------------------------|
| Back Pressure/Axial Load (MPa/kN): | 1/50, 3/50, 20/100 |
| Sample Sizes (mm): | 30mm to 150mm (1 and 3MPa version), 38mm to 50mm (20 MPa version) |
| Max Matric suction (HAEPD kPa): | 500 or 1500 |

Technical Specification Rowe and Barden cell:

| | |
|----------------------------------------------|-----------------------------------|
| Back Pressure/Axial Stress (MPa/MPa): | 3.5/3.5 |
| Sample Sizes (mm): | 50, 61.8, 63.5, 70, 76.2 or 100mm |
| Max Matric suction (HAEPD kPa): | 500 or 1500 |

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GDS have supplied equipment to over 84% of the world's top 50 Universities who specialise in Civil & Structural Engineering, according to the "QS World University Ranking 2019" report.

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50**

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100% of our customers answered "YES"

Results from our post-delivery survey asked customers for feedback on their delivery, installation (if applicable), supporting documentation, apparatus and overall satisfaction with GDS. The survey ran for two years.



Made in the UK:

All GDS products are designed, manufactured and assembled in the UK at our offices in Hook. All products are quality assured before they are dispatched.

GDS are an ISO9001:2015 accredited company. The scope of this certificate applies to the approved quality administration systems relating to the "Manufacture of Laboratory and Field Testing Equipment".

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BRITISH
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Extended Warranties:

All GDS apparatus are covered by a 12 month manufacturers warranty. In addition to the standard warranty, GDS offer comprehensive extended warranties for 12, 24 and 36 months, for peace of mind against any repairs in the future. The extended warranties can be purchased at any time during the first 12 months of ownership.



GDS Training & Installation:

All installations & training are carried out by qualified engineers. A GDS engineer is assigned to each order throughout the sales process. They will quality assure the apparatus prior to shipping, if installation has been purchased, install the apparatus on the customers site & provide the training.



Technical Support:

GDS understand the need for ongoing after sales support, so much so that they have their own dedicated customer support centre. Alongside their support centre GDS use a variety of additional support methods including remote PC support, product helpsheets, video tutorials, email and telephone support.

