

# SD-SWCC - Stress Dependent Soil Water Characteristic Curve Testing System

## Related Standards: ASTM D6836-16 (Method B)

VJ Tech's SD - SWCC Testing System is used to determine the influence of the stress state on the Soil Water Characteristic Curve (SWCC) of a soil sample.

The Multi-Purpose Consolidation Cell is fitted with the precision made 70 mm diameter UNSAT kit, one of 3 interchangeable testing kits specifically designed for this cell.

Vertical Load is applied using our Motorised Auto Multi-Purpose Frame and suction is generated using a Pro Pneumatic APC at the top of the sample and a Pro Hydraulic APC at the base, thus applying the axis-translation technique.

Both drying and wetting SWCCs can be determined, allowing hysteresis to be studied. The Test is controlled using our Clisp Studio SD-SWCC Software Module, which has easy test setup and configuration and facilities for data export to Excel.

## Features

- Air-tight cell Fitted with High Air Entry Disc (3, 5 and 15 bar available) for 70 mm Sample
- Temperature Probe, Heater Element & Controller unit for controlling condensation
- Pro Hydraulic and Pneumatic Automatic Pressure Controllers for applying suction
- Motorised actuation of load
- Includes 15 kN or 50 kN External Load cell
- Optional Internal Submersible Load Cell available
- Ethernet or USB Interface for PC control
- Integrated 7" Touchscreen Colour Display for Standalone use without PC Control if required
- On-board data logging with large data storage (up to 14 million records) using SD card (8GB standard)
- Data export to PC for manipulation within Excel
- High Speed sensor conversion (24 bit, up to 4000 samples/sec)
- Up to 5 input channels (1 x digital & 4 x analogue)
- Built-in live data table and graphs
- Built-in Auto engaging function with definable engage value
- Auto reverse from limit switch activation
- Built-in auto protection for sensor limits



## Ordering Information

### ACONS Pro Frames (Please select one)

**VJT0650M2-P** ACONS Pro Motorised Automatic Multi-Purpose Frame (15 kN)

**VJT0650M2-PHL** ACONS Pro (High Capacity) Motorised Automatic Multi-Purpose Frame (50 kN)

### Multi-Purpose Cell & Kit

**VJT0651-H** Multi-Purpose Consolidation Cell for up to 70 mm Samples

**VJT0651-H-UNSAT70** MPCC - UNSAT Kit (70 mm Diameter)

### Temperature Control Equipment

**VJT0651-H-TEMP** Temperature Probe, Heater Element & Controller unit (for Multi-Purpose Consolidation Cell)

### Automatic Pressure Controllers

**VJT2250-P** Pro Pneumatic Automatic Pressure Controller (1 MPa)

**VJT2266-P** Pro Hydraulic Automatic Pressure Controller (1 MPa)

### Internal Submersible Load Cell (recommended)

**VJT0353B/MPC** 25 kN Internal Submersible Load Cell with 25 mm diameter Ram

### Displacement Transducer

**VJT0271** LSCT Displacement Transducer, 25 mm X 0.001 mm with 2 metre cable & Plug

### Transducer Bracket

**VJT0284AC** Transducer Bracket for LSCT transducer

### Clisp Studio Software Required

**VJT-csSDSWCC** Clisp Studio SD-SWCC Software

# VJT-csSD-SWCC: Clisp Studio Stress Dependent Soil Water Characteristic Curve Software

The VJ Tech Clisp Studio SD-SWCC Software module enables the User to determine the influence of the stress state on the Soil Water Characteristic Curve (SWCC) of a soil sample.

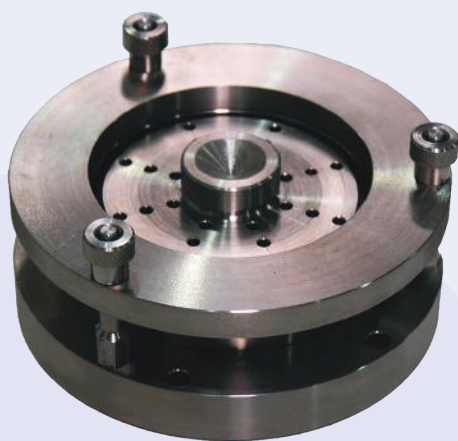
## System Specifications

Maximum Frame Capacity	15 kN or 50 kN
Resolution	0.1 N
Accuracy	0.15% FRO
Adjustable Displacement Rate	0-10.0000 mm/min
Maximum Matric Suction	1000 kPa
Connectivity	Ethernet or USB Interface
Power Supply	DC Adaptor (Output 24V DC, Input 90-240V, 50/60Hz, 1ph.)

## MPCC - UNSAT Kit (70mm Diameter)

The MPCC - UNSAT Kit is designed to fit inside VJ Tech's Multi-Purpose Cell, which can also be used for CRS and Oedometer testing with their respective kits (and other accessories).

It comprises a Loading Cap and Base Adaptor, Clamp Ring and bolts, a Sample Cutting Ring, Upper and Lower Porous Discs and a 5 bar High Air Entry Disc is fitted as standard.



VJT0651-H-UNSAT70 - MPCC UNSAT Kit (70 mm)

## Clisp Studio csSDSWCC Software

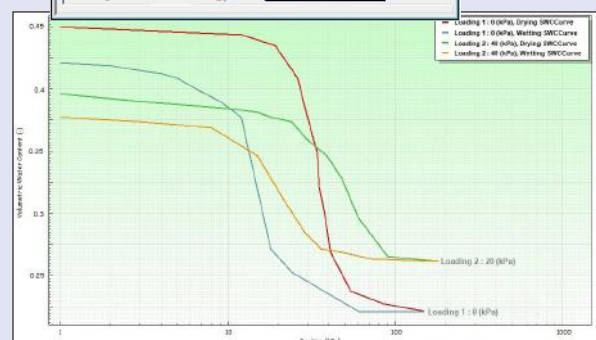
- Data logging
- Consolidation
- Drying Soil Water Characteristic Curves
- Wetting Soil Water Characteristic Curves
- Automatic vertical loading sequences (subject to a load frame)
- Automatic start/stop of test/machine
- Live tabular display of logged and calculated data
- Live graphical display of logged and calculated data
- User defined views / graphs / tables
- Standard predefined presentation reports
- Export of data to Excel or Paste to clipboard
- Test script export & import

Consolidation Graph



Specimens		1	Vert Stress: Loading 01: 50 (kPa)	Lock
<b>Measured Parameters</b>				
Settlement Input	$L_{IP}$	-3.035	(mm)	
Applied Stress	$\sigma'_i$	50	(kPa)	
Applied Load	$F_{IP}$	231	(N)	
Total test time	$T_t$	02:52:20	(h:m:s)	
<b>Test Status</b>				
Time	$t$	00:14:00	(h:m:s)	
Total change in H	$\Delta H_i$	1.294	(mm)	
Suction	$S$	20	(kPa)	
Void Ratio	$e_f$	0.618		
Vol Water Content	$\theta$	18.2	(%)	
Degree of Sat.	$S_r$	52.9	(%)	

Live  
Data  
View



Wetting and Drying Curves Graph