



Product Code

UTS-2060.SMPR	Automatic Direct-Residual Shear Test Machine
UTS-2065	Shearbox Assembly, 60x60 mm
UTS-2065-07	Cutting Ring, 60x60 mm
UTS-2065-08	Extrusion Dolly, 60x60 mm
UTS-2065-09	Calibration Disk for UTS-2065
UTS-2066	Shearbox Assembly, Ø 60 mm
UTS-2066-07	Cutting Ring, Ø 60 mm
UTS-2066-08	Extrusion Dolly, Ø 60 mm
UTS-2066-09	Calibration Disk for UTS-2066
UTS-2067	Shearbox Assembly, 100x100 mm
UTS-2067-07	Cutting Ring, 100x100 mm
UTS-2067-08	Extrusion Dolly, 100x100 mm
UTS-2067-09	Calibration Disk for UTS-2067
UTS-2068	Shearbox Assembly, Ø 100 mm
UTS-2068-07	Cutting Ring, Ø 100 mm
UTS-2068-08	Extrusion Dolly, Ø 100 mm
UTS-2068-09	Calibration Disk for UTS-2068
UTS-2069	Shearbox Assembly, Ø 2.5 inch
UTS-2069-07	Cutting Ring, Ø 2.5 inch
UTS-2069-08	Extrusion Dolly, Ø 2.5 inch
UTS-2069-09	Calibration Disk for UTS-2069
UTS-2100	Slotted Weight Set, 50 kg (4x10 kg + 1x5 kg + 1x2 kg + 3x1 kg)

Standards

ASTM D3080, BS 1377-7; AASHTO T236, TS 1900-2, CEN-ISO-TS 17892-10



The test covers the determination of consolidated drained shear strength of a soil material by direct shear. UTS-2060.SMPR Automatic Direct-Residual Shear Test Machine is motorized and floor mounted. Normal stress is applied to the specimen by utilizing a weight hanger, a lever arm (amplification ratios of 9:1, 10:1 and 11:1) and a vertical loading yoke. Hanger can receive up to 50 kg of weight which is amplified by the lever arm and transferred to the specimen by the vertical loading yoke as a normal force up to 5 kN (5000 N).

The machine is supplied with a shearbox bowl that accepts 60 mm square, 100 mm square, 60 mm dia. round, 100 mm dia. round and 2.5 inc. dia. round shearboxes. Shearbox bowl is designed to contain water to inundate the specimen during the test. The shearbox assemblies consist of rigid walled shear box, a vertical loading pad with grooved back face, a grooved retaining plate and 2pcs. porous plates (UTS-2067-04)

Drive unit utilizes a high resolution servomotor and a gear box assembly to ensure continuously variable transmission of speed in a range from 0.00001 mm-min. to 15 mm-min for both forward and reverse directions. 5 kN load cell is used for load measurement. 10 x 0.001 mm and 25 x 0.001 mm sensitivity linear potentiometric transducers are used for vertical and horizontal displacement measurements respectively. Displacement limits are controlled by limit switch.

Shearbox Assemblies, Slotted Weight Sets or Individual Weights and other optional accessories including cutting ring and extrusion dolly should be ordered separately.

Models for 220-240V 50-60 Hz, 1 ph.

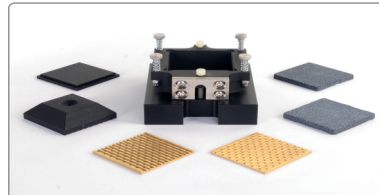
UTS-2060.SMPR

Models for 110-120V, 60Hz, 1ph.

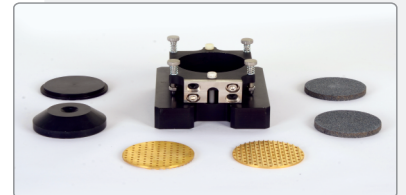
UTS-2060.SMPR-N



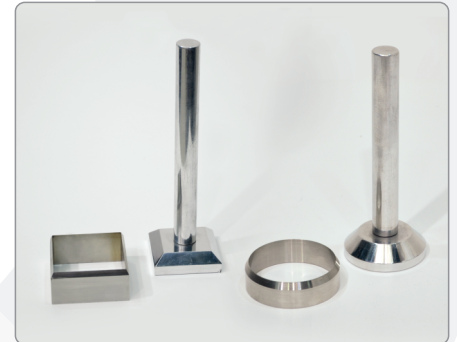
UTS-2065



UTS-2067



UTS-2068



UTS-2069-08

UTS-2069

Accessories of Shear Box Assemblies

Model of Shear Box	UTS-2065 60x60 mm	UTS-2066 Ø:60 mm	UTS-2067 100x100 mm	UTS-2068 Ø:100 mm	UTS-2069 Ø:2,5 inch
Shear Box	UTS-2065-01	UTS-2066-01	UTS-2067-01	UTS-2068-01	UTS-2069-01
Loading Pad	UTS-2065-02	UTS-2066-02	UTS-2067-02	UTS-2068-02	UTS-2069-02
Grooved Ret. Plate	UTS-2065-03	UTS-2066-03	UTS-2067-03	UTS-2068-03	UTS-2069-03
Porous Plate (2 pcs.)	UTS-2065-04	UTS-2066-04	UTS-2067-04	UTS-2068-04	UTS-2069-04

The Optional Accessories of UTS-2060 Automatic Direct / Residual Shear Test Machine

Cutting Ring	UTS-2065-07	UTS-2066-07	UTS-2067-07	UTS-2068-07	UTS-2069-07
Extrusion Dolly	UTS-2065-08	UTS-2066-08	UTS-2067-08	UTS-2068-08	UTS-2069-08
Calibration Disk	UTS-2065-09	UTS-2065-09	UTS-2065-09	UTS-2065-09	UTS-2065-09

Alternative Slotted Weight Sets of UTS-2100

Product Codes	Total Mass	Included Weight (1 kg)	Included Weight (4 kg)	Included Weight (8 kg)
UTS-2102	32 kg	4	3	2
UTS-2104	64 kg	4	5	5
UTS-2106	88 kg	4	5	8

Individual Slotted Weights

UTS-0382	0,25 kg	UTS-0390	5 kg
UTS-0384	0,50 kg	UTS-0392	10 kg
UTS-0386	1 kg	UTS-0394	4 kg
UTS-0388	2 kg	UTS-0396	8 kg

U-Touch PRO Control Unit for Direct/Residual Shear Test

The U-Touch PRO Control Unit for Direct/Residual Shear Test is designed to control the machine to perform direct - residual shear test acc. to EN, ASTM/AASHTO and BS standards to process.

The Unit can perform direct - residual shear tests as a stand-alone without the use of a PC or with the USOFT-2060 software and a PC. Control of machine, acquisition of load and displacement data in real time are provided by the unit.

The U-Touch PRO has easy to use menu options. It displays all menu option listings simultaneously, allowing the operator to access the required option quickly to activate that option or enter a numeric value to set the test parameters and see all the data while the test running.

The U-Touch PRO graphic display allows real time Load etc. Displacement or Stress etc. Displacement graph. The advanced functions for data base management provide an easy navigation of all saved data. The test results certificate includes all descriptive information. Therefore test parameters can be set and details about the test carried out such as customer details, test type, specimen type, user info and other information required can be entered and printed out as well as test reports and graphs. Also, all minor revisions can be implemented upon request. The Software calculates both the maximum and resilient shear stress.

After three runs, the software calculates the cohesion value "c" and shear resistance angle ϕ by using the best straight line fit.

Main Features

- Can make the test with displacement control.
- Real time display of test graph.
- 4 analog channels for load cell and displacement sensor
- Calibration function for channels.
- Programmable digital gain adjustment for load-cell and potentiometric sensors, voltage and current transmitters.
- Closed-loop PID for steady pace rate.

Consolidation

- 25 pairs of time-vertical displacement values are written to memory.
- The vertical displacement value can be tared prior to recording.
- The analogical channel reading vertical displacement has 260000 points effective resolution.
- The memory can be exported to PC software.

Testing

- 3 different shearing test types can be selected.
- The machine run with the speed determined by user to the direction of shear and stop when the load decreases.
- The machine run with the speed determined by user to the direction of shear and stop when it reaches to the target horizontal displacement value which is also determined by the user at the beginnig of the test.
- The machine run with the speed to the direction of shear, after reaching to the target displacement, returns and finds the exact initial (HOME) position, waits for the dissipation of excess pore pressure and starts to the same procedure again. User can create testing scenarios by determining all the parameters of this multi-reversal shearing test such as test speed, return speed, displacement target, standby time, and cycle number.

- By using the control unit, consolidation before shearing tests are possible.

- The screen displays load, shear stress, horizontal and vertical displacements, and τ - Δx graph continuously.

PLEASE see the pages of "General Properties of U-Touch PRO Control Units" for details of the properties of software and hardware.

UTEST Software for Direct/Residual Shear Test

Utest Direct and Residual Shear Software is developed in accordance with ASTM D3080, BS 1377:7 and AASHTO T 236 standards to be used with UTS-2060.SMPR Machine.

Direct residual and shear software consist of two sections. First section is used for the consolidation of the sample prior to shear.

The second section of the software is capable of performing three different types of test. The first type moves the machine with the speed determined by user until a shear failure occurs. On the second type, the user can set a speed and a horizontal displacement and the test will continue until the machine reaches to the set value.

On the last type of test, the machine can be configured for cyclic (multireversal) operation. In cyclic mode device will advance to the determined distance with an assigned speed and turn back to the initial (home) position with a different assigned speed, wait for a time for the dissipation of excess pore pressure and start to the new cycle again.

All these test parameters such as forward-reverse speed, distance, cycle number, etc. can be defined by the user.

The software supports 5 different normal load values in order to calculate cohesion (C) and internal friction angle (ϕ) values. Prior to the test normal load value must be entered to the software.

The normal stress is calculated according to normal load and sample size automatically.

The software supports both square and round type samples.

Stress values can be optionally and automatically calculated as "standard area" and the "corrected area" approach. When the test is completed peak and residual stress values are recorded.

The normal load versus peak stress pair is used for the calculation of cohesion and internal friction angle value. At least 3 loading with different normal loads are required for this property.

One can set test speed, axis values etc. through the setup of the software. The results can be submitted as a report or can be exported to Microsoft Excel for advanced reanalyze procedures. See the pages of "General Properties of Utest USOFT Softwares" for detailed properties of the software.



The Automatic Direct Residual Shear Test Machine is supplied complete with;

- Load Cell 5 kN
- Linear Potentiometric Displacement Transducer (10x0.001 mm)
- Linear Potentiometric Displacement Transducer (25x0.001 mm)
- Software

Speed Range	0.00001 to 10,00 mm/min
Maximum Shear Force	5 kN (5000 N)
Maximum Vertical Load	0 to 500 N
Horizontal Travel	30 mm
Dimensions	450x1250x1200 mm
Weight (approx.)	110 kg
Power	1100 W