

CONSOLIDATION TEST

STANDARDS: ASTM D2435, D3877, D4546 | BS 1377:5
 AASHTO T216 | XP P94 090-1, P94-091
 UNE 103-405, 103-602

The one-dimensional consolidation test of a soil sample enables to ascertain the settlement characteristic over a given period of time. The soil specimen under test is axially loaded and laterally contained.

Loads are applied with progressive increases and the settlement values are read on a dial gauge or on a digital display (through a displacement transducer).

Two different oedometer models are proposed:

S260 Front loading oedometer with dial gauge or digital data acquisition system.

S262N Edotronic, pneumatic, fully automatic touch-screen consolidation apparatus (see next pages).

S260

FRONT LOADING OEDOMETER CONSOLIDATION APPARATUS

Rigidly manufactured from aluminium alloy casting to provide a high degree of accuracy with any frame distortion under load. The load bridge group is supported in high accuracy self-aligning seat balls. The beam provides three loading ratio: 9:1 10:1 11:1 and the beam assembly is fitted with an adjustable counterbalance weight.

Maximum load: 170 kg of slotted weights, corresponding to 1870 kg using the beam ratio 11:1

The oedometer accepts cells up to 100 cm²

Supplied complete with rod holding the weights and coupling block holding the dial gauge or transducer.

Supplied **without**: consolidation cell, weights, dial gauge (or transducer), holding bench which have to be ordered separately.

Weight: 25 kg approx.

ACCESSORIES

S376 DIAL GAUGE 10 mm travel x 0.01 mm subdiv. for vertical displacements.

or:

S375-01 DIAL GAUGE 12 mm travel x 0.002 mm subdiv.

Alternative solution:

S336-11 LINEAR VERTICAL DISPLACEMENT TRANSDUCER, 10 mm travel

S336-30 EXTENSION CABLE 2 metres long, or:

S336-31 EXTENSION CABLE 5 meters long, or:

S336-32 EXTENSION CABLE 10 meters long

S337-51

CALIBRATION process of the displacement transducer to the data acquisition unit of the oedometer.

S260
with cell and dial gauge



S265

S336-11



S334

S260 with cell and S334 Cyber-Plus 8 Evolution

S334

CYBER-PLUS 8 EVOLUTION

8 channels acquisition and processing data system (expandable to 16 channels) colour "Touch Screen" display, it automatically performs test and data processing. Directly connected to PC via USB, it prints the test certificate. Equipped with slots for external Pendrive or SD Card infinite memory supports.

Technical details: see p. 559, Hardware details at p. 18

S260-05N

Software OedoLab Reports - MATEST MADE

Technical Data: see p. 531

CONSOLIDATION CELLS - FIXED RING

Made from **brass**, with specimen holding fixed ring having cutting rim so as to be utilized also to sample undisturbed specimens. Accurately manufactured these cells are supplied complete with loading piston, couple of porous stones and plexiglass transparent water jacket.

Model	Specimen diameter mm	Specimen area cm ²	Specimen thickness mm	Spare cutting ring mm	Specimen tamper	Spare couple of porous stones
S268	50.47	20	20	S122	S123	S274 KIT
S268-05	63.5	31.67	20	S122-19	S123-05	S274-10 KIT
S268-01	71.40	40	20	S122-01	S123-01	S274-01 KIT
S268-04	75.00	44.16	20	S122-17	S123-04	S274-09 KIT
S268-02	79.80	50	20	S122-02	S123-02	S274-02 KIT
S268-03*	112.80	100	25	S122-03	S123-03	S274-03 KIT

* The consolidation cell Ø 112.8 mm is made from aluminium.



CONSOLIDATION CELLS - PERMEABILITY ATTACHMENT

Made from **brass**, similar in manufacture to the fixed ring cells, they are also provided of a pipe connector with cock and graduated glass burette 10 ml capacity allowing to perform permeability tests.

Model	Specimen Ø mm	Specimen area cm ²	Specimen thickness mm	Hollow punch	Specimen tamper	Spare couple of porous stones
S272	50.47	20	20	S122-04	S123	S274-04 KIT
S272-05	63.5	31.67	20	S122-20	S123-05	S274-11 KIT
S272-01	71.40	40	20	S122-05	S123-01	S274-05 KIT
S272-04	75.00	44.16	20	S122-18	S123-04	S274-08 KIT
S272-02	79.80	50	20	S122-06	S123-02	S274-06 KIT
S272-03*	112.80	100	25	S122-07	S123-03	S274-07 KIT

* The consolidation cell Ø 112.8 mm is made from aluminium.

S275 PERMEABILITY ATTACHMENT

Complete with stand, clamps and hose it is connected to the cells mod. S272 to S272-05. Recommended for soil samples having great value of permeability. Burette has 50 ml capacity and subdiv. 0.1 ml.

Weight: 5 kg approx.

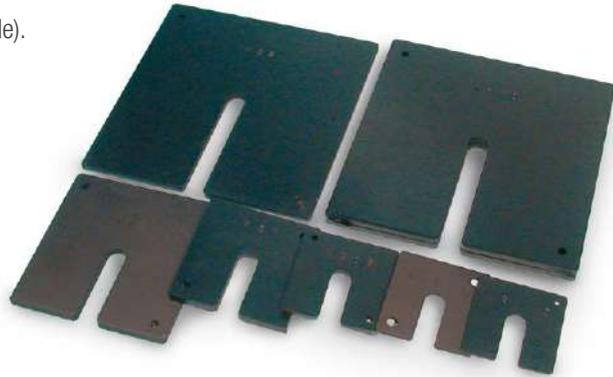


OEDOMETER: ACCESSORIES
SLOTTED WEIGHTS

Steel made, painted against corrosion (mod. E066-02 brass made).

Available slotted weights:

Model	Weight	Model	Weight
E066-02	100 g	S273-07	4 kg
S273-06	250 g	S273-02	5 kg
S273-05	500 g	S273-08	8 kg
S273-04	1 kg	S273-01	10 kg
S273-03	2 kg		


KIT OF SLOTTED WEIGHTS

S273 KIT	S273-01 KIT	S273-02 KIT
S273-01 = 4x10 kg	S273-08 = 7x8 kg	S273-01 = 6x10 kg
S273-02 = 1x5 kg	S273-07 = 1x4 kg	S273-02 = 3x5 kg
S273-03 = 2x2 kg	S273-03 = 1x2 kg	S273-03 = 1x2 kg
S273-04 = 1x1 kg	S273-04 = 1x1 kg	S273-04 = 1x1 kg
	S273-05 = 1x500 g	S273-05 = 3x500 g
	S273-06 = 2x250 g	S273-06 = 2x250 g
TOTAL: 50 kg	TOTAL: 64 kg	TOTAL: 80 kg

HOLDING BENCH, made from sturdy structural painted steel, complete with locking bolts and nuts.

- S265** BENCH HOLDING one apparatus
S265-01 BENCH HOLDING three apparatuses


S265
GAUGE BLOCKS
GRADE 1

Used to calibrate the linear displacement transducers.

AVAILABLE MODELS

- S336-41** GAUGE BLOCK, nominal length 5 mm
S336-43 GAUGE BLOCK, nominal length 10 mm


S336-43
S336-41

S260-05N
 Data import from the CyberPlus

SPARES

- S335-15** Universal coupling pliers for dial gauge/transducer. It accepts all Matest displacement transducers and dial gauges (\varnothing from 8 to 20 mm)
S260-13 Mounting device between the universal coupling pliers S335-15 and the consolidation apparatus to fix the transducer/dial gauge for the vertical displacement.


S336-30
S335-15
S260-13
S336-11

BUYER'S GUIDE FOR ONE STANDARD CONSOLIDATION SYSTEM AND ONE AUTOMATIC CONSOLIDATION DATA ACQUISITION/PROCESSING SYSTEM.
S260
 with accessories

S265-01

S334

Configuration for one standard Oedometer apparatus	Model
Front loading oedometer	S260
Oedometer bench (for one or three oedometers)	S265 / S265-01
Dial gauge	S376 / S375-01
Consolidation cell, fixed ring	S268 / S268-05
Spare cutting ring (to combine to the consolidation cell)	S122 / S122-19
Specimen tamper (to combine to the consolidation cell)	S123 / S123-05
Spare porous stones (to combine to the consolidation cell)	S274 / S274-10
Set of slotted weights	S273 / S273-10
Permeability measurement:	
Permeability consolidation cell	S272 / S272-05
Permeability attachment (50 ml burette)	S275
Hollow punch (to combine to the consolidation cell)	S122-04 / S122-20
Spare porous stones (to combine to the consolidation cell)	S274-04 / S274-11

Configuration for one Oedometer apparatus with electronic measurement and data acquisition/processing:	Model
Oedometer with accessories as listed in the standard configuration (without the dial gauge S376), and also:	
Cyber-Plus 8 Evolution, 8 channels (expandable to 16 channels) automatic data acquisition/processing	S334
Displacement transducer (in quantities as the oedometers)	S336-11
Extension cable (in quantities as the transducers)	S336-30 / S336-32
Software OedoLab Reports - Matest made	S260-05N
Gauge blocks to calibrate the transducers	S336-41 / S336-43
or:	
Transducer / Oedometer calibration process	S337-51

S261**EDOMEC****AUTOMATIC CONSOLIDATION APPARATUS (OEDOMETER)**

ADVANCED ELECTROMECHANICAL SYSTEM

STANDARDS: BS 1377:5 | ASTM D2435, D3877, D4546 | AASHTO T216 | NF P94-090-1, NF P94-09

This automatic consolidation system, ideal for modern and efficient laboratories, has been developed to eliminate or reduce to the absolute minimum any forms of manual intervention, which the oedometer test.

This machine has innovative technology for controlling the application of loads. The load application system is guaranteed by a sophisticated PID electromechanical system. It is able to control load very accurately, thanks to the high frequency control up to 1KHz. This allows high precision at low loads, high speed of load application at high loads.

The test is configured using a special test icon, in which it is possible to set loads and acquisition times; both the loads and the acquisition times are freely configurable. The large display makes it easy to visualize test data and graphs.

**Frame Specifications:**

- Standard load cell :10kN (up to 25 kN on request)
- Precision: 0.15 % at full range
- Ram travel: up to 25 mm
- Minimum speed: 0.00001 mm/min
- Maximum speed: 99.99999 mm/min
- Control frequency: up to 1 kHz
- Horizontal clearance: 175 mm
- Vertical clearance: 185 mm (without extension columns)
265 mm (with extension columns)
- Maximum cell size dia: 112.8 mm
- Safety function for automatic machine stop when maximum load or maximum strain/deformation is reached.

Firmware:

- Equipped with 8 channels, suitable for connection of load, displacement, deformation, LVDT, temperature (PT100, PT1000, NTC) and strain gauge (by using an external adapters) transducers.
- Semi-automatic configuration and calibration of all transducers connected.
- Automatic calculations and real time display of graphs and results according to the Standard.
- The digital controller (PC) works on Windows CE based system and can be easily updated through the USB with no need to uninstall or move the controller.
- Sampling frequency of 2 kHz with a selectable sampling rate between 1 Hz and 20 Hz (5 levels).
- Unlimited memory storage with: 2 USB ports, 1 SD card. Ethernet port for remote control through PC.

MAIN FEATURES

- Automatic calculations and real time display of graphs and result according the standard.
- Maximum vertical force: up to 25 kN
- Minimum speed: 0.00001 mm/min
Maximum speed: 99.99999 mm/min
- 8 channels for acquisition and data processing system.
- Sampling frequency of 2 kHz with a selectable sampling rate between 1 Hz and 20 Hz

**S261****ACCESSORIES**

- S262-12N** SOFTWARE OEDOLAB CONNECT - MATEST MADE
- S336-11** LINEAR DISPLACEMENT-DEFORMATION
- S337-51** CALIBRATION PROCESS of the linear displacement transducer combined with the Edotronic.
- S268/S272-05** CONSOLIDATION CELLS, different models:
see p. 529



MODULARITY TEST OPTION



S262-12N Modularity View



S334-12

S334-11

Oedolab Connect S262-12N allows automatic data acquisition and control for each oedometer configured into the dedicated Pneumatic Oedometer control settings window (see above image).

This way, up to 24 units can be connected to the same PC by using an Ethernet network, providing modern geotechnical laboratories with a powerful tool to control single or multiple units at choice.

ACCESSORIES

S334-11 Network connection RS45 cable

S334-12 Switch to connect from 2 to 7 Cyber-plus units to the Ethernet Network