

Compression test apparatus



Compression test apparatus

In many land use systems worldwide, soil deformation is a major problem because of increasing land use intensity. On arable soils machine traffic increases in load and wheeling frequency, leading to (sub)soil compaction and deeper soil degradation in terms of hydrologic or pneumatic functions. Altered soil functions, in particular reduced hydraulic conductivities and impeded aeration, may decrease crop growth and productivity as well as the filtering and buffering capacity of soils. Prevented gas exchange and longer-lasting anoxia in soils due to the reduced pore continuity and pore functioning also affects global change processes. To evaluate potential risks for irreversible soil deformation, it is necessary to quantify the mechanical stability. A commonly applied method is determining the pre-compression stress, commonly under static loading conditions in oedometer tests. Conducting agricultural scientific research such as repeated cyclic/dynamic loading studies e.g. wheel passes or animal trampling, can also be a scope of interest. The compression test apparatus measures the impact of vertical stress on an undisturbed soil sample. During the measurement the matric potential, compression stress and vertical displacement are measured simultaneously as a function of the vertical applied stress and time. The apparatus operates under computer control using multifunctional software for executing measurement protocols and both numerical and graphical visualised data presentation.

This equipment measures the soil consolidation in accordance to NEN 5118, EN17892-5 and ASTM D698 - 07e1 considering the following restrictions:

- The maximum specimen load is 600 kPa for a 100 mm sample ring
- Tests are conducted in non water immersed condition
- Please consult instrument specification for detailed information in case of accreditation

Applications

- Soil science
- Soil mechanics
- Soil erosion
- Environmental research
- Basic material research

User groups

- Laboratories
- Research institutes
- Educational institutes, universities
- Consultants

Features

- User-friendly and easy operation
- Accurate measurement principles
- All-in-one compression measurements
- Sample diameter 100 mm, height 30 mm
- Software-controlled measurement protocols
- Simultaneously operation of up to 8 instruments
- Graphical instrument overview and data zoom functions
- Calibration functions
- Excellent price/quality/performance ratio
- Data file export i.e. Excel
- Upgradable for dynamic operation
- Developed in cooperation with Christian Albrechts University zu Kiel

Technical specifications

Item	Range	Resolution	Accuracy
Stress vertical	0-600 kPa	0.1 kPa	2 kPa
Response speed	10 sec. @1% end value (adaptable by PID controller parameters)		
Soil matric potential	-1000...+1000 hPa	0.1 hPa	2 hPa
Compression	0-30 mm	0.001 mm	0.1 mm
Sample log rate	0.1...60 sec.		
Soil sample diam.	100 mm		
Pressure-in max.	0.7 Mpa / 7 bar		
Load max.	5 kN		
Stress out max.	600 kPa		
Mains supply	100-250 Volts AC		
Mains frequency	47-63 Hz		
Power consumption	0.8 W		
Environmental conditions:			
Temperature	15-35 °C		
Humidity	20-80% RH (non condensing)		
Dimensions	45 x 45 x 125 cm		
Software language	English		
P.C. connection	USB		

Instrument layout

