SOIL > CYCLIC

HOLLOW CYLINDER TESTING MACHINE

Code : T803

- Purpose-built for investigating soil behavior under principal stress rotation with combined axial load, confining pressure, back pressure, torque, and controlled rotation. Ideal for liquefaction studies, anisotropy assessment, non-coaxiality, and strain-path controlled research.
- Enables independent control of σ_1, σ_2, σ_3 directions and magnitudes through axial force, cell/back pressure, and torsional shear supporting both static and cyclic modes with precise path following.
- Hollow specimen form reduces end restraint and facilitates uniform shear strain distribution, allowing small-strain characterization as well as large cyclic deformation programs.
- Closed-loop control in torque, rotation, axial load, or axial strain, with configurable endpoints by cycle count, strain limit, pore-pressure ratio (ru), stress path limit, or stiffness degradation threshold.
- High-rate acquisition with synchronized channels (axial load/displacement, torque/rotation, cell and pore pressures, volume change) for real-time plots (τ–γ, q–εa, Δu–N, stress path p′–q).
- Flexible specimen tooling for saturated and unsaturated testing workflows, with saturation aids (CO_2/de-aired water), B-value checks, and optional local strain measurement.

STANDARDS

JGS 0511-2009 • JGS 0543

TECHNICAL SPECIFICATIONS

- Axial load capacity: 10–300 kN (50 kN standard)
- Torque capacity: 100–400 N·m (250 N·m standard)
- Rotation range: ±20° (typical programmable limit)
- Cyclic frequency: up to 5 Hz
- Control modes: Torque / rotation / axial load / axial strain (closed loop)
- Volume change resolution: ≤ 0.01 cm^3 (with digital volume controller)
- Axial displacement range: ±25–50 mm (LVDT, model-dependent)
- Rotation measurement: High-resolution encoder (≤ 0.001° typical)
- Specimen size (standard): 150 mm OD / 100 mm ID; other sizes on request
- Consolidation modes: Isotropic / anisotropic / K_0; strain-path control available
- Waveforms: Sinusoidal (standard), user-defined sequences for stress-rotation paths
- Software: Saturation & B-check, consolidation staging, cyclic scheduler, real-time charts, auto report templates
- Power: Single-phase 208–230 V, 50/60 Hz (region-dependent)
- Optional ALFA Cloud integration for secure, real-time data upload, centralized storage, and web access to results.

EQUIPPED WITH

- Servo-actuated load frame with axial actuator and integrated controller
- Hollow-cylinder cell with torsional drive, upper/lower pedestals and rotation bearings
- Dual pressure/volume controllers for cell and back pressure with de-airing accessories

- Axial load cell, axial LVDT, pore pressure and cell pressure transducers, torque transducer, rotation encoder
- Cabling, tubing, porous stones, membranes, and specimen tooling for standard sizes
- PC control software with cyclic torsional and static modules, plotting and reporting

SUPPLIED WITH

- Membranes, O-rings, filter papers (assorted for standard specimen size)
- Essential fittings, hoses, and quick-connects set
- Starter consumables kit for hollow specimens