

Dynamic Simple Shear with Confining Pressure Testing System

The VJ Tech Dynamic Simple Shear Apparatus with Confining Pressure (DSS-C) utilises 2 electro mechanical dynamic actuators for applying the vertical and horizontal loads to the sample which is held under Pressure in an adapted Triaxial type Cell.

The 2 electro mechanical dynamic actuators are controlled by the Dual Axis Dynamic Servo Controller (DSC2) which is connected via Ethernet to a PC. The vertical and horizontal displacements are measured with Encoders which are part of the servo motors. The maximum range of travel in each axis is protected by a limit switch and each strain rate is easily set from the PC.

Back Pressure is controlled and measured using a Hydraulic APC and Cell Pressure using an Air APC with an Air/Water interface.

Vertical load is measured by an internal Load Cell and Horizontal Load by an internal in-line Load Cell. The Loads and Pore Water Pressure are measured via the DSC2

The controlling software (Clisp Studio DYNADSS-C) enables all stages of the test (Saturation, Consolidation (Isotropic, Anisotropic or K0), and either Static Loading, Cyclic Shear (Stress or Strain) or Liquefaction) to easily be set up and run.

Specifications

| | |
|-------------------------|---------------------------------|
| Max. Frequency | 5 Hz (upgradeable to 10 Hz) |
| Max. Dynamic Load | +/- 5 kN (upgradeable to 10 kN) |
| Max. Confining Pressure | 1000 kPa |
| Max. Back Pressure | 1000 kPa |
| Sample Diameter | Up to 70 mm |
| Nominal Sample Height | 40 mm |
| PC Interface | Ethernet |

Ordering Information

| | |
|---|-----------------|
| Dynamic Simple Shear with Confining Pressure Testing System | VJT9411 |
| Dynamic Simple Shear with Confining Pressure Apparatus | VJT2831 |
| Dynamic Servo Controller (Dual Axis) | VJT-DSC2 |
| Pneumatic Automatic Pressure Controller (1000 kPa) | VJT2250 |
| Hydraulic Automatic Pressure Controller (1000 kPa) | VJT2266 |
| Vertical Internal Load Cell (5 kN) | VJT0351B |
| Horizontal Internal Load Cell (5 kN) | VJT0351B |
| PWP Transducer (10 bar) | VJT0250 |



VJT9411 - Dynamic Simple Shear with Confining Pressure Testing System

Features

- Static or dynamic testing via servo controlled high speed motors
- Axial and shear stress-strain control
- +/-5 kN, 0-5 Hz electro-mechanical actuator mounted to crossbeam
- +/-5 kN, 0-5 Hz electro-mechanical actuator fixed to rear
- Stainless Steel Simple shear apparatus/assembly includes;
 - Vertical and horizontal actuator mountings
 - 70 mm diameter grooved pedestal and Top cap with drainage/pressure connection
 - 70 mm diameter sample former and clamp
 - All transducer and load cell mounting brackets
- Confining Cell on runners for ease of sample assembly
- Confining Pressure up to 1000 kPa
- Back Pressure up to 1000 kPa
- Cell accomodates sample sizes up to 70 mm
- Maximum Horizontal travel 25 mm
- Maximum Vertical travel 25 mm
- Full control from a PC (running Clisp Studio) over an Ethernet connection via the Digital Servo Controller
- Waveforms available: Sinusoidal, Triangular, Square, Haversine, Saw Tooth, User Defined
- All Transducers are plugged into the rear of the Digital Servo Controller

Clisp Studio (csDSS-C) Dynamic Simple Shear with Confining Pressure Testing System Software

The VJ Tech Clisp Studio DSS-C Software module enables you to perform dynamic simple shear tests on a sample contained within a Cell with a Confining Pressure.

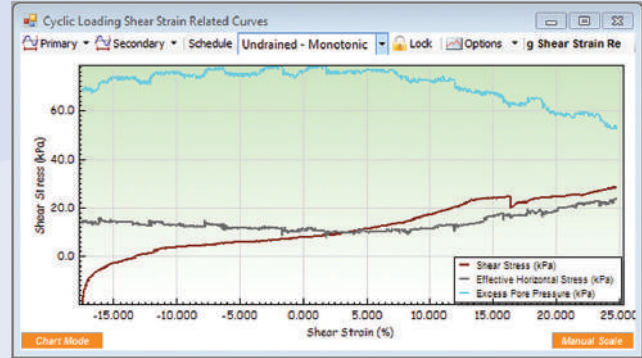
The software can be used with the VJ Tech Dynamic Simple Shear with Confining Pressure apparatus which enables the sample to be Saturated and Consolidated, and then either Statically Loaded, Cyclically Sheared or tested for Liquefaction.

Features

- Test automation available
- No sample confining rings required
- Skirted Top Cap and Base Pedestal
- Easy instrument and equipment setup and calibration
- Easy test setup using wizard style Assistant
- User configurable high speed data logging
- Saturation stage (Ramp or Step)
- Isotropic, Anisotropic or K0 Consolidation Stage
- Static Loading stage
- Simple Cyclic Shear stage (Stress or Strain)
- Liquefaction cyclic shear stage
- Live view of sensor readings and status
- Live Data View (Measured and calculated data)
- Live graphical displays of logged and calculated data
- Live tabular displays of logged and calculated data
- User configurable views, graphs and tables
- Cycle Analysis of Cyclic and Liquefaction stages
- Optional customised presentation reports on request
- Data export to Excel and script export and import

Ordering Information

VJT-csDSS-C Clisp Studio Dynamic Simple Shear with Confining Pressure Software



Cyclic Loading Monotonic Shearing Graph

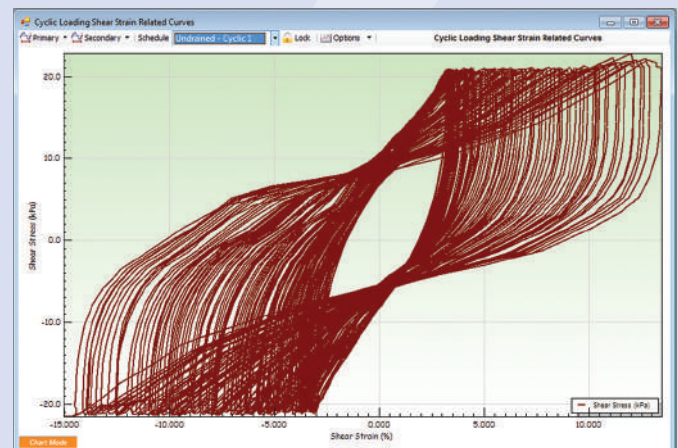
The window shows the following data for Specimen 1, Stage Cyclic 1:

| Calculated Parameters | |
|---|------------------|
| Shear Stress τ_{xy} | 31.0 (kPa) |
| Shear Strain γ | -1.217 (%) |
| Excess Pore Pressure Δu | -60.66 (kPa) |
| Stress Ratio τ_{xy} / σ'_v | -1.827 |
| Effective Vertical Stress σ'_v | -17.0 (kPa) |
| Effective Horizontal Stress σ'_h | 55.7 (kPa) |
| Test Times | |
| Cyclic Loading Time | 02:25:07 (h.m.s) |
| Time T_0 | 01:56:54 (h.m.s) |
| Shear Cycle Count | 0 |

Cyclic Loading Live Data

| Specimen | S | Dynamic Δu (kPa) | | Excess Pore Pressure σ (kPa) | | Total Vertical Stress σ'_v (kPa) | | Effective Vertical Stress σ'_v (kPa) | | Effective Horizontal Stress σ'_h (kPa) | | Shear Stress τ_{xy} (kPa) | | Shear Strain γ (%) | | Vertical Strain ϵ_v (%) | | Volume Strain ϵ_v (%) | | Axial Strain ϵ_a (%) | |
|----------|------|--------------------------|------|-------------------------------------|------|---|-------|---|--------|---|--------|--------------------------------|--------|---------------------------|---|----------------------------------|---|--------------------------------|---|-------------------------------|---|
| | | v | h | v | h | v | h | v | h | v | h | v | h | v | h | v | h | v | h | v | h |
| 7255 | 1460 | 68.49 | 90.5 | 82.0 | 22.2 | 13.5 | -4.5 | -0.207 | 0.154 | 6.582 | 1.087 | -0.036 | 28.371 | | | | | | | | |
| 7256 | 1460 | 68.68 | 90.9 | 82.0 | 22.2 | 13.3 | -7.0 | -0.315 | -0.167 | 6.582 | -1.178 | -0.036 | 28.371 | | | | | | | | |
| 7257 | 1461 | 68.63 | 90.8 | 81.0 | 22.2 | 12.4 | -10.0 | -0.450 | -0.520 | 6.582 | -3.660 | -0.036 | 28.371 | | | | | | | | |
| 7258 | 1461 | 69.06 | 91.8 | 81.0 | 22.8 | 11.9 | -13.9 | -0.610 | -0.812 | 6.582 | -5.717 | -0.036 | 28.371 | | | | | | | | |
| 7259 | 1461 | 70.01 | 93.7 | 82.0 | 23.7 | 12.0 | -16.5 | -0.696 | -1.001 | 6.582 | -7.049 | -0.036 | 28.371 | | | | | | | | |
| 7260 | 1461 | 69.75 | 95.2 | 83.0 | 25.5 | 13.3 | -18.1 | -0.709 | -1.111 | 6.582 | -7.826 | -0.036 | 28.371 | | | | | | | | |
| 7261 | 1461 | 69.99 | 95.6 | 83.0 | 25.6 | 13.0 | -19.0 | -0.745 | -1.173 | 6.582 | -8.263 | -0.036 | 28.371 | | | | | | | | |
| 7262 | 1462 | 72.74 | 98.0 | 86.0 | 25.3 | 13.3 | -19.8 | -0.783 | -1.217 | 6.582 | -8.573 | -0.036 | 28.371 | | | | | | | | |
| 7263 | 1462 | 70.78 | 97.6 | 85.0 | 26.8 | 14.2 | -20.4 | -0.761 | -1.255 | 6.582 | -8.839 | -0.036 | 28.371 | | | | | | | | |
| 7264 | 1462 | 71.08 | 97.7 | 85.0 | 26.6 | 13.9 | -21.0 | -0.790 | -1.293 | 6.582 | -9.101 | -0.036 | 28.371 | | | | | | | | |
| 7265 | 1462 | 72.16 | 98.9 | 86.0 | 26.8 | 13.8 | -21.2 | -0.792 | -1.318 | 6.582 | -9.284 | -0.036 | 28.371 | | | | | | | | |
| 7266 | 1462 | 70.84 | 98.1 | 85.0 | 27.2 | 14.2 | -21.1 | -0.775 | -1.334 | 6.582 | -9.398 | -0.036 | 28.371 | | | | | | | | |
| 7267 | 1463 | 71.74 | 99.0 | 86.0 | 27.2 | 14.3 | -20.8 | -0.764 | -1.342 | 6.582 | -9.450 | -0.036 | 28.371 | | | | | | | | |

Cyclic Loading Calculated Results



Cyclic Loading Shear Strain Related Curves Graph