

IPC Global®

Servo-Hydraulic

Four Point Bending Apparatus

The science of testing made easy®



The Servo-hydraulic Four Point Bending Apparatus comprises of an electrically powered hydraulic loading system, a beam cradle, an environmental chamber, IMACS Integrated Multi-Axis Control System and Windows application software.

The beam cradle has been designed to subject an asphalt beam specimen to 4 point bending with backlash free rotation and horizontal translation of all load and reaction points.

SPECIFICATIONS



Features

- Totally integrated stand-alone system
- Digital servo-controlled hydraulic actuator provides accurate control of loading waveshape
- Innovative “floating straight-edge” on-specimen transducer eliminates errors due to frame compliance
- Backlash free rotation and translation on all load and reaction points
- Sinusoidal or haversine controlled strain or controlled stress loading
- Controlled force, motorised specimen clamping
- Non-linear regression data fitting ensures reliable determination of phase and modulus
- Cost effective solution for high volume testing

Size

1100(l) x 630(w) x 1500(h)

1910(h) with Environmental Chamber

Weight (dry) 250kg

Loading Frequency up to 60Hz

Load Capacity up to 10kN dynamic

Actuator Stroke 10mm

Specimen Size

70 max(h) x 85 max(w) x 380 min(l) mm

Environmental Temperature 0 to +60°C

Mains Power

230V / 50-60Hz single phase

Noise Level less than 70db at 2m

Control & Data Acquisition, see IMACS specifications

Servo- Hydraulic 4 point Bending Apparatus



The specimen is laterally positioned by hand using etched lines as a visual guide for 2 specimen sizes, nominally 50 and 63.5 mm in width.

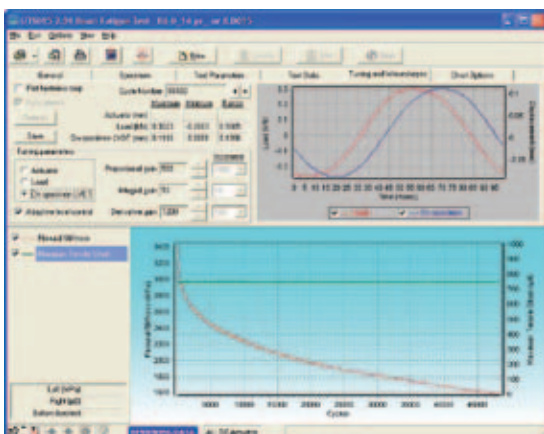
Vertical clamping of the specimen is achieved by servo-motor driven ball screws which are operated continuously during the test to take up the compliance of the specimen at the clamping surfaces and the clamping force is controlled via the IMACS by regulating the motor current.

The hydraulic system uses a bottom loading actuator system with a high performance electrohydraulic servo-valve, with PID closed-loop control and a run time adaptive control algorithm that adjusts the command signal during the running of a test. The hydraulic pump is a 230 Volt, single phase unit and uses a thermostatically controlled, fan-forced air cooling system to cool the hydraulic oil.

The test control system is computer based, using sensors on the machine for feedback (load and strain) signals.

The user friendly PC software is menu-driven. The system gathers the dynamic data from the specimen under test, then displays plots appropriate to each test type and function mode, in real time on the PC. Optional non-linear regression data fitting ensures reliable determination of phase and modulus.

The software automatically saves test information in binary file format, allowing data files to be generated for importing into a spreadsheet package, or review of previously-run tests through the graphics screens of the system. Binary files may also be emailed for diagnostic purposes.



Complies with the following standards:
EN12697-24 Annex D
EN12697-26 Annex B
prEN13108-20 Annex D
AASHTO T321 (formerly TP8)
AST 03 (AUSTRADS)

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