

**DATASHEET**

# Servo-Pneumatic Four Point Bend Apparatus MkIV

## Accessories



- Deflection can be measured at the neutral axis or at the top surface of the specimen
- Backlash-free rotation and translation on all load and reaction points
- Sinusoidal or haversine controlled strain or controlled stress loading
- Constant force motorized clamping with multiple preset force levels
- Non-linear regression data fitting ensures reliable determination of phase and modulus

### How it works

The pneumatic four point bend apparatus uses a bottom loading actuator with high performance servo-valve, PID closed-loop control and run time adaptive control algorithm that adjusts the command signal during the test. The control system uses load and strain feedback signals.

Vertical clamping of the specimen is achieved by servo-motor driven ball screws which are operated continuously during the test to adjust for the compliance of the specimen at the clamping surfaces.

Developed from expert knowledge of applications, it features real-time graphs for monitoring the specimen under test; portable binary data files for sharing, reviewing & analysis; and 'live' transducer levels display.



The Servo-Pneumatic Four Point Bend Apparatus comprises of a pneumatically powered loading system, a beam cradle, an optional environmental

chamber, IMACS2 Third Generation Integrated Multi-Axis Control System and UTS Neutron test application software.

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

### Features

- Digital servo-controlled pneumatic actuator provides accurate control of loading waveshape
- Suitable for use with both on-specimen and outer fixed reference point measurement systems



Complies with the following standards: EN12697-24 Annex, EN12697-26 Annex, AASHTO T321 (formerly TP8), ASTM D7460, D8237, AG:PT/T233 (formerly AST 03:2000)

# Technical Information

## Specifications

<b>Loading frequency</b>	up to 60 Hz*
<b>Load capacity</b>	up to 5kN dynamic
<b>Optional on-specimen displacement transducers</b>	LVDT +/- 0.5mm, +/- 1mm or +/- 2.5mm

## Test standards

- AASHTO T321 — Fatigue (Formerly TP8)
- AG:PT/T274 — Fatigue (Formerly AG:PT/T233, AST 03:2000)
- ASTM D7460 — Flexural Fatigue
- EN12697-24D — Resistance to Fatigue
- EN 12697-26C — Stiffness
- ASTM D8237 — Fatigue Failure

## Specimen Dimensions

<b>Specimen sizes</b>	Maximum height 70 mm Maximum width 80 mm Length from 380 mm to 500+ mm
<b>Accommodates typical specimens</b>	50 x 50 x 400 mm 60 x 60 x 400 mm 50 x 63 x 400 mm 70 x 70 x 500 mm
<b>Loading spans</b>	Inner span ≤118.5 mm to >140 mm Outer span ≤355.5 mm to >420 mm
<b>Yoke Alignment Tool (H x W x Outer span centers)</b>	50 x 50 x 355.5 mm 70 x 70 x 420 mm (optional)

## Dimensions and Weight

<b>Apparatus</b>	600 x 230 x 490 – 560mm (H x D x W) / 35kg
<b>IMACS2</b>	445 x 280 x 245 mm (H x D x W) / 6kg **
<b>Air Accumulator</b>	330 x 470 x 450mm (H x D x W) / 9.5kg

## Services

<b>Air supply</b>	Clean, dry air at 800 – 900kPa
<b>Minimum flow rate</b>	5 liter/sec

\* Load limitations apply at higher frequencies

\*\* Control & Data Acquisition, see IMACS2 specifications

## Ordering Information

### PV74A12/I2

Four Point Bend Apparatus — with IMACS2

### PV70206

On-specimen LVDT +/-0.5mm span

### PV70407

On-specimen LVDT +/-1mm span

### PV70408

On-specimen LVDT +/-2.5mm span

### PV70406

Optional Yoke Alignment Tool for 420mm (Outer span centers) x 70mm x 70mm

### PV70403

Un4PB PVC beam (dummy specimen)

### PV70116

Temperature measurement kit

### PV70404

4PB Apparatus reference beam assembly

### PV70E02

Environmental Chamber (-25°C / +60°C)

Additional accessories may be required to create a working testing system. Please contact us for advice.

## CONTROLS

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