

# Servo-Pneumatic Four Point Bend Apparatus

## Accessories

### ADVANCED PAVEMENTS TESTING SYSTEMS



The Servo-Pneumatic Four Point Bend Apparatus comprises of a pneumatically powered loading system, a beam cradle, an optional environmental chamber, IMACS Integrated Multi-Axis Control System and UTS 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
- 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
- Constant force motorized specimen clamping
- Non-linear regression data fitting ensures reliable determination of phase and modulus.

## Specifications

### Test Standards

AASHTO T321 – Fatigue (Formerly TP8)  
 AG:PT/T274-15 – Fatigue (Formerly AG:PT/T233, AST 03:2000)  
 ASTM D7460 – Flexural Fatigue  
 EN1269724D – Resistance to Fatigue  
 EN 12697-26B – Stiffness

### Specimen Dimensions

|                            |  |
|----------------------------|--|
| <b>Loading Frequency</b>   | up to 60Hz*  |
| <b>Load Capacity</b>       | up to 5kN dynamic  |
| <b>Specimen Size</b>       | 70 max. x 80 max. x 380 min. mm<br>(H x W x L)   |
| <b>Yoke Alignment Tool</b> | 50 x 50 x 355.5mm (H x W x Outer span centers)<br>70 x 70 x 420mm (H x W x Outer span centers) |
| <b>Air Supply</b>          | Clean, dry air at 800 – 900kPa   |
| <b>Minimum Flow Rate</b>   | 5 liter/sec  |

\*Load limitations apply at higher frequencies

### Dimensions and Weight

|                        |  |
|------------------------|--|
| <b>Apparatus</b>       | 600 x 230 x 490 - 560mm (H x D x W)/35kg |
| <b>IMACS</b>           | 270 x 360 x 450mm (H x D x W)/ 11kg      |
| <b>Air Accumulator</b> | 330 x 470 x 450mm (H x D x W)/9.5kg      |

Control & Data Acquisition, see IMACS specifications

### Ordering information

PV74A02 – Four Point Bend Apparatus - Pneumatic  
 PV70406 – Yoke Alignment Tool for 420mm  
 (Outer span centers) x 70mm x 70mm  
 PV70403 – 4PB PVC beam (dummy specimen)  
 PV70116 – Temperature measurement kit  
 PV70404 – 4PB Apparatus reference beam assembly  
 PV70405 – 4PB Aluminium channelled reference beam  
 PV70E02 – Env Chamber (-25°C / +60°C)

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

## Testing Made Easy

**The specimen is laterally positioned by eye using etched lines as a visual guides.**

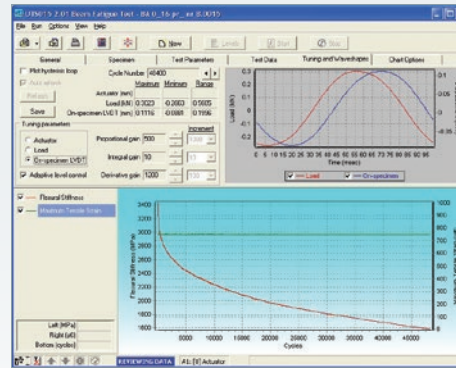
Vertical clamping of the specimen is achieved by servo-motor driven ball screws which are operated continuously during the test to adjust for the compliance of the specimen at the clamping surfaces.

**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.

IPC Global's UTS test and control software is known for its simplicity in use, clarity of results and analytical power.

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.

Optional non-linear regression data fitting ensures reliable determination of phase and modulus.



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

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