

According  
to Superpave™,  
ASTM, AASHTO and EN  
Standards

# DYNAPAVE

**A new generation of Dynamic Testing Systems  
for Road Paving Materials**

Suitable to measure:

- STIFFNESS
- FATIGUE STRENGTH
- PERMANENT DEFORMATION

Predict Asphalt Pavement  
long term performance

Three Models:

15 - 30 - 130 kN capacity



# Dynamic Testing Systems for Road Paving Materials

Established in 1968, CONTROLS has quickly grown to be a leader in the production of testing equipment for the Construction Industry.

**Our mission is:**

**"To become our Customer's best partner, to deliver unique expertise, to provide outstanding service and specialized skills."**

**Our efforts are aimed:**

**"To comply with the current needs and to anticipate the future requirements."**

**All our machines are developed with high attention to:**

**"Mechanical and Electronical combined with Ergonomics and latest technologies User-friendly concepts".**

## CONTROLS: a long experience in advanced testing systems

From the beginning CONTROLS develop advanced equipment and this long experience was further increased in 2004 by incorporating **WYKEHAM FARRANCE**, a well-known English company manufacturing **Geotechnical Testing Systems**, established in 1941. This synergy has focused in the research, design and manufacture of new advanced testing systems such as the Dynamic testing Machines.

**Wf Wykeham Farrance** Since 1941  
PIONEERS IN ADVANCED SOIL TESTING





## The evolution of Road material testing

*Empirical testing of asphalt adopted until now, is no longer sufficient to support the leap in quality of paving over time due to the continual increase of road traffic in terms of frequency, weight, and load time.*

*The development of the testing techniques based on the Asphalt Pavement Performances, started in 1987 by the **Strategic Highway Research Program (SHRP)** in USA.*

*After 5 years of research **SHRP released the SUPERPAVE™ (Superior PERforming asphalt PAVements)** introducing new testing systems and specifications for road materials. This activity led to a number of Standards as, for example:*

- **AASHTO TP8 Flexural Fatigue and AASHTO TP9 Indirect Tensile Test.**

*In parallel, in Europe, the **CEN committee** developed several Standards concerning the Dynamic tests as an example:*

- **EN 12697 Test methods for hot mix asphalt: Part 24 Resistance to Fatigue, Part 25 Cyclic Compression test, Part 26 Stiffness.**

*Our R&D Department has promptly acknowledged from the beginning in 1987 the new requirements. Vast range of testing apparatus for asphalt and bituminous mixtures has been considerably increased with the adoption of the Superpave™ testing methods and subsequent ASTM, AASHTO, EN Standards and a key role is played by the dynamic technologies.*

## DYNAPAVE Dynamic Testing Systems

Three models are available featuring different performances and applications:

- SERVO-PNEUMATIC model **78-B7015** 15 kN capacity
- SERVO-HYDRAULIC model **78-B7030** 30 kN capacity
- SERVO-HYDRAULIC model **78-B7130** 130 kN capacity

Servo-pneumatic model outstands for the **PERFORMANCE/PRICE RATIO**. It is suitable for loads up to 15 kN and frequencies up to 30 Hz.

Servo-hydraulic models excel at **HIGHER FORCES - up to 30 and 130 kN - and HIGHER FREQUENCIES up to 70 Hz.**



## DYNAPAVE

### 78-B7015

### Servo-pneumatic dynamic testing system 15 kN capacity

To perform Indirect Tensile Stiffness, Creep, Fatigue, Triaxial on Unbound Materials and other tests under load or displacement control

**TO PERFORM THE FOLLOWING TESTS** (using the appropriate accessories, see page 10, 11 and 12)

#### INDIRECT TENSILE TEST

##### STANDARDS

- EN 12697-24 Annex E, EN 12697-26 Annex C
- ASTM D4123
- AASHTO TP31, AASHTO TP9, AASHTO T322
- BS DD 226

#### UNIAXIAL CREEP AND PERMANENT DEFORMATION TEST

##### STANDARDS

- EN 12697-25 Method A
- NCHRP 9-19 / 9-29 (Flow time), NCHRP 9-19 / 9-29 (Flow number)
- AASHTO TP79 (Flow number)

#### TRIAxIAL TEST AND UNBOUND RESILIENT MODULUS TEST

##### STANDARDS

- EN 12697-25 Method B, EN 13286-7
- AASHTO TP 46, AASHTO T294, AASHTO T307

#### 4 POINT BENDING

##### STANDARDS

- EN 12697-24 Annex D, EN 12697-26 Annex B
- AASHTO TP8, AASHTO T321

### GENERAL DESCRIPTION

This system performs load or displacement controlled test with programmable waveshape over a large range of frequencies, simulating the traffic effect. The user-friendly interface allows the operator to monitor the test performance and to evaluate results. The system has to be completed by the accessories conforming to the test to be performed. See page 10, 11 and 12. The temperature controlled cabinet model 78-B7192 is also offered separately.

#### MAIN FEATURES

- Servo-pneumatic dynamic system with outstanding performance-price value
- Easy to use software driving the operator through the test
- Software language fully customizable
- High stiffness testing frame
- Fatigue rated servo-pneumatic actuator with internal displacement transducer
- Fast and easy crosshead positioning
- Large testing chamber
- Complete range of accessories and softwares conforming EN, ASTM and AASHTO Standards



78-B7015 inside the 78-B7192 temperature controlled cabinet and accessory

#### ORDERING INFORMATION

■ **78-B7015** Servo-pneumatic dynamic testing system 15 kN cap., including testing frame, control unit, air reservoir and load cell. 110-230V, 50-60 Hz, 1 ph.

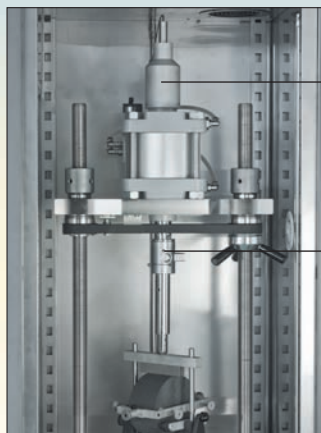
**NOTE:** This system require a suitable air compressor. The following model is ideal for this application.

► **86-D2015/A** Air compressor, 8 bar continuous working pressure, 10 bar max. pressure, 5.5 kW, 200 l cap. ait tank. 400 V, 50 Hz, 3 ph.

## TECHNICAL SPECIFICATIONS

### FRAME

- High stiffness steel frame, 15 kN cap., vertical daylight 650 mm, distance between columns 339 mm
- Double effect servo-pneumatic actuator, 30 mm stroke
- 30 mm displacement transducer inbuilt in the actuator
- Complete with pneumatic reservoir, 5 l cap., with pressure gauge, filter, connections, hoses
- Load cell  $\pm 25$  kN cap.
- Max frequency 30 Hz



*Servo-Pneumatic actuator*

*Load cell*

### CONTROL SYSTEM - CDC Compact Dynamic Controller

- Inputs: 12 analog input channels, 8 digital inputs
- Outputs: No. 2 analog output, 8 digital outputs, dedicated solenoid valve for air supply

### CONTROL AND FEEDBACK

- 10 kHz control loop with 2.5 kHz data acquisition rate for all channels
- Two servo-controlled axes (vertical actuator and confining pressure)
- Vertical actuator can be controlled by different feedback signals (load cell, internal displacement transducer, external displacement transducer)
- Confining pressure controlled by pressure transducer
- Analog inputs can be calibrated with multi-point linearization
- User defined calibration ranges via software
- 100 Mb/s Ethernet



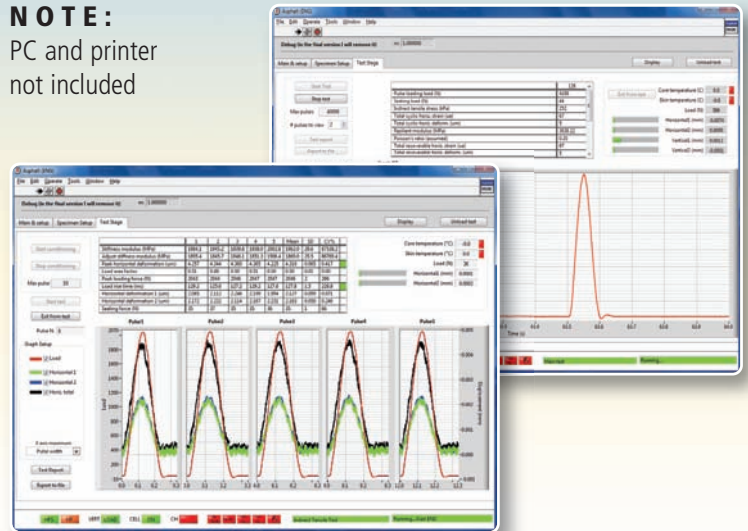
*CDC - Compact Dynamic Controller*

### PC SOFTWARE

- All-in-one monitoring and control software
- User-friendly calibration management
- Wide range of modules for asphalt, unbound materials and user defined tests
- Sine, Haversine, Square and user defined programmable waveshapes
- Real time channels readout
- Programmable test procedures
- Programmable "end of the test" function

### NOTE:

PC and printer not included



### DIMENSIONS AND WEIGHT

- Frame (wxdxh): 480x300x1200 mm, 110 kg approx.
- Control unit (wxdxh): 420x270x150 mm, 12 kg approx.

### TEMPERATURE CONTROLLED CABINET

#### ■ 78-B7192

Temperature controlled cabinet -10 to +60°C - 230 V, 50-60 Hz, 1 ph.

#### ■ 78-B7192/Z

Temperature controlled cabinet -10 to +60°C - 110 V, 60 Hz, 1 ph.

This unit is required to perform all tests listed above.

### GENERAL SPECIFICATION

- Temperature range: -10 to +60°C, resolution 0.1°C
- Stainless steel AISI 304, 18/10 internal and external frame
- Three glass door
- Forced ventilation
- Closed loop PID temperature controller
- Cooling unit complete with defrost system
- Internal lightning
- Power: 1800 W
- Ex. dimensions: 700x700x2030 mm
- Weight approx.: 140 kg

## DYNAPAVE

### 78-B7030

## Servo-hydraulic dynamic testing system 30 kN capacity

To perform Indirect Tensile Stiffness, Creep, Fatigue, Triaxial on Unbound Materials and other tests under load or displacement control

TO PERFORM THE FOLLOWING TESTS (using the appropriate accessories, see page 10, 11 and 12)

### INDIRECT TENSILE TEST

#### STANDARDS

- EN 12697-24 Annex E, EN 12697-26 Annex C
- ASTM D4123
- AASHTO TP31, AASHTO TP9, AASHTO T322
- BS DD 226

### UNIAXIAL CREEP AND PERMANENT DEFORMATION TEST

#### STANDARDS

- EN 12697-25 Method A
- NCHRP 9-19 / 9-29 (Flow time), NCHRP 9-19 / 9-29 (Flow number)
- AASHTO TP79 (Flow number)

### TRIAxIAL TEST AND UNBOUND RESILIENT MODULUS TEST

#### STANDARDS

- EN 12697-25 Method B, EN 13286-7
- AASHTO TP 46, AASHTO T294, AASHTO T307

### 4 POINT BENDING

#### STANDARDS

- EN 12697-24 Annex D, EN 12697-26 Annex B
- AASHTO TP8, AASHTO T321

### 2 POINT BENDING

#### STANDARDS

- EN 12697-24 Annex A, EN 12697-26 Annex A

## GENERAL DESCRIPTION

This system performs load or displacement controlled test with programmable wave shape over frequencies up to 70 Hz, simulating the traffic effect. The user-friendly interface allows the operator to monitor the test performance and to evaluate results. The system has to be completed by the accessories conforming to the test to be performed. See page 10, 11 and 12. The temperature controlled cabinet model 78-B7193 is also offered separately.



78-B7030 inside the 78-B7193 temperature controlled cabinet and accessory

## MAIN FEATURES

- High performance double acting hydraulic actuator for testing frequencies up to 70 Hz
- Fatigue-rated servo-hydraulic actuator with internal displacement transducer
- Fast and easy motorized crosshead positioning with automatic hydraulic clamping
- Large testing chamber
- Fully stand alone system, hydraulic pump and pressure regulator included
- Complete range of accessories and test software conforming to EN, AASHTO and ASTM Standards
- Software drives the operator through the test execution
- Software language fully customizable

## ORDERING INFORMATION

■ **78-B7030** Servo-hydraulic dynamic testing system 30 kN cap. static, 25 kN cap. dynamic, including testing frame, load cell, hydraulic power pack and control unit. 230 V, 50 Hz, 1 ph.

■ **78-B7030/Z** Servo-hydraulic dynamic testing system 30 kN cap. static, 25 kN cap. dynamic, including testing frame, load cell, hydraulic power pack and control unit. 110 V, 60 Hz, 1 ph.

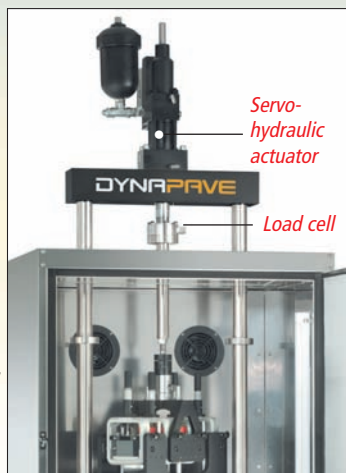
## TECHNICAL SPECIFICATIONS

### FRAME and HYDRAULIC ACTUATOR

- High stiffness steel frame, 30 kN cap., vertical daylight 800 mm, distance between columns 450 mm
- Double action servo-hydraulic actuator, 30 kN static, 25 kN dynamic capacity, 50 mm stroke
- 50 mm displacement transducer inbuilt in the actuator
- Load cell  $\pm 30$  kN cap.
- Max frequency 70 Hz
- Motorized adjustable lower crosshead and hydraulic clamping
- High pressure filter 45  $\mu$ m with clogging sensor
- Hydraulic accumulator 1,5 l capacity
- Direct operated high-frequency servo-valve

### HYDRAULIC POWER PACK

- Max. working pressure: 210 bar
- Max. flow rate: 5 l/min
- Mains power: 2.2 kW; 230 V, 50 Hz or 110 V, 60 Hz, 1 phase
- Digital control of temperature, oil level and filter
- Remote PC control
- Continuous pressure control adjustable by PC
- Air cooling of hydraulic oil (cooling water not necessary)



### CONTROL SYSTEM - CDC Compact Dynamic Controller

- Inputs: 12 analog input channels, 8 digital inputs
- Outputs: No. 2 16 bit analog output, 8 digital outputs

### CONTROL AND FEEDBACK

- 10 kHz control loop with 2.5 kHz data acquisition rate for all channels
- Two servo-controlled axes (vertical actuator and confining pressure)
- Vertical actuator can be controlled by different feedback signals (load cell, internal displacement transducer, external displacement transducer)
- Confining pressure controlled by pressure transducer
- Analog inputs can be calibrated with multi-point linearization
- User defined calibration ranges via software
- 100 Mb/s Ethernet



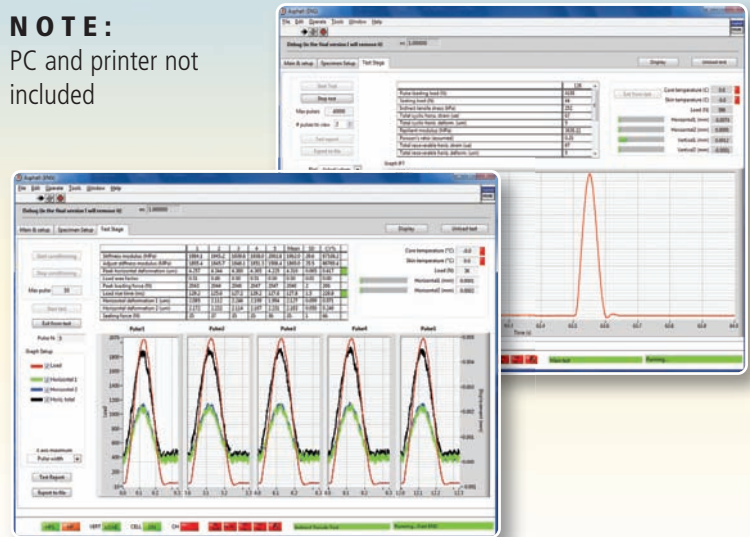
**CDC - Compact Dynamic Controller**

## PC SOFTWARE

- All-in-one monitoring and control software
- User-friendly calibration management
- Wide range of modules for asphalt, unbound materials and user defined tests
- Sine, Haversine, Square and user defined programmable waveshapes
- Real time channels readout
- Programmable test procedures
- Programmable "end of the test" function

### NOTE:

PC and printer not included



## DIMENSIONS AND WEIGHT

- Frame (wxdxh): 660x560x1800 mm., 180 kg approx.
- Hydraulic power pack (wxdxh): 600x500x800 mm, 90 kg approx.
- Control unit (wxdxh): 420x270x150 mm. 12 kg approx.

## TEMPERATURE CONTROLLED CABINET

### ■ 78-B7193

Temperature controlled cabinet -10 to +60°C - 230 V, 50-60 Hz, 1 ph.

### ■ 78-B7193/Z

Temperature controlled cabinet -10 to +60°C - 110 V, 60 Hz, 1 ph.

This unit is required to perform all tests listed above.

## GENERAL SPECIFICATION

- Temperature range: -10 to +60°C, resolution 0.1°C
- Stainless steel AISI 304, 18/10 internal and external frame
- Three glass door
- Forced ventilation
- Closed loop PID temperature controller
- Cooling unit complete with defrost system
- Internal lightning
- Power: 2300 W
- Ex. dimensions: 790x900x1560 mm
- Weight approx.: 180 kg

# Dynamic Testing Systems for Road Paving Materials

## DYNAPAVE 78-B7130

### Servo-hydraulic dynamic testing system 130 kN capacity

To perform Indirect Tensile Stiffness, Creep, Fatigue, Triaxial on Unbound Materials and other tests under load or displacement control

TO PERFORM THE FOLLOWING TESTS (using the appropriate accessories, see page 10, 11 and 12)

#### INDIRECT TENSILE TEST

##### STANDARDS

- EN 12697-24 Annex E, EN 12697-26 Annex C
- ASTM D4123
- AASHTO TP31, AASHTO TP9, AASHTO T322
- BS DD 226

#### UNIAXIAL CREEP AND PERMANENT DEFORMATION TEST

##### STANDARDS

- EN 12697-25 Method A
- NCHRP 9-19 / 9-29 (Flow time), NCHRP 9-19 / 9-29 (Flow number)
- AASHTO TP79 (Flow number)

#### TRIAxIAL TEST AND UNBOUND RESILIENT MODULUS TEST

##### STANDARDS

- EN 12697-25 Method B, EN 13286-7
- AASHTO TP 46, AASHTO T294, AASHTO T307

#### 4 POINT BENDING

##### STANDARDS

- EN 12697-24 Annex D, EN 12697-26 Annex B
- AASHTO TP8, AASHTO T321

#### GENERAL DESCRIPTION

This system performs load or displacement controlled test with programmable wave shape over frequencies up to 70 Hz, simulating the traffic effect. The user-friendly interface allows the operator to monitor the test performance and to evaluate results.

The system has to be completed by the accessories conforming to the test to be performed. See page 10, 11 and 12.

The temperature controlled cabinet model 78-B7194 is also offered separately.



78-B7130 with 78-B7194 temperature controlled cabinet and accessory

#### MAIN FEATURES

- High performance double acting hydraulic actuator for testing frequencies up to 70 Hz
- Fatigue-rated servo-hydraulic actuator with internal displacement transducer
- Fast and easy motorized crosshead positioning with automatic hydraulic clamping
- Large testing chamber
- Fully stand alone system, hydraulic pump and pressure regulator included
- Complete range of accessories and test software conforming to EN, AASHTO and ASTM standards
- Software drives the operator through the test execution
- Software language fully customizable

#### ORDERING INFORMATION

■ **78-B7130** Servo-hydraulic dynamic testing system 130 kN cap. static, 100 kN cap. dynamic, including testing frame, load cell, hydraulic power pack and control unit. 380 V, 50 Hz, 3 ph.

■ **78-B7130/Z** Servo-hydraulic dynamic testing system 130 kN cap. static, 100 kN cap. dynamic, including testing frame, load cell, hydraulic power pack and control unit. 220 V, 60 Hz, 3 ph.

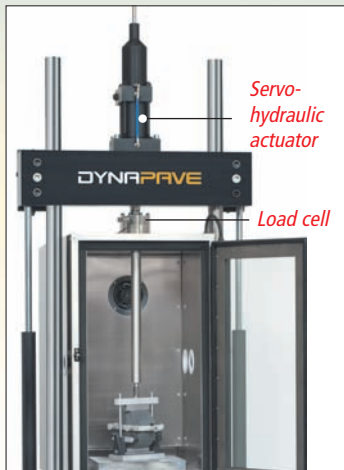
## TECHNICAL SPECIFICATIONS

### FRAME and HYDRAULIC ACTUATOR

- High stiffness steel frame, 130 kN cap., vertical daylight 1000 mm, distance between columns 600 mm
- Double action servo-hydraulic actuator, 130 kN static, 100 kN dynamic capacity, 100 mm stroke
- 100 mm displacement transducer inbuilt in the actuator
- Load cell  $\pm 130$  kN cap.
- Max frequency 70 Hz
- Motorized adjustable lower crosshead and hydraulic clamping
- High pressure filter 45  $\mu$ m with clogging sensor
- Hydraulic accumulator 1,5 l capacity
- Direct operated servo-valve, -3 dB amplitude ratio at 350 Hz, phase LAG -90° at 350 Hz

### HYDRAULIC POWER PACK

- Max. working pressure: 210 bar
- Max. flow rate: 18 l/min
- Mains power: 7.5 kW; 380 V, 50 Hz or 220 V, 60 Hz, 3 phase
- Digital control of temperature, oil level and filter
- Remote PC control
- Continuous pressure control adjustable by PC
- Water-oil heat exchanger 10 l/min Tin 29°C



### CONTROL SYSTEM - CDC Compact Dynamic Controller

- Inputs: 12 analog input channels, 8 digital inputs
- Outputs: No. 2 16 bit analog output, 8 digital outputs,

### CONTROL AND FEEDBACK

- 10 kHz control loop with 2.5 kHz data acquisition rate for all channels
- Two servo-controlled axes (vertical actuator and confining pressure)
- Vertical actuator can be controlled by different feedback signals (load cell, internal displacement transducer, external displacement transducer)
- Confining pressure controlled by pressure transducer
- Analog inputs can be calibrated with multi-point linearization
- User defined calibration ranges via software
- 100 Mb/s Ethernet



## PC SOFTWARE

- All-in-one monitoring and control software
- User-friendly calibration management
- Wide range of modules for asphalt, unbound materials and user defined tests
- Sine, Haversine, Square and user defined programmable waveshapes
- Real time channels readout
- Programmable test procedures
- Programmable "end of the test" function

### NOTE:

PC and printer not included



## DIMENSIONS AND WEIGHT

- Frame (wxdxh): 1000x1000x3000 mm, 600 kg approx.
- Hydraulic power pack (wxdxh): 1200x650x1200 mm, 160 kg approx.
- Control unit (wxdxh): 420x270x150 mm. 12 kg approx.

## TEMPERATURE CONTROLLED CABINET

### ■ 78-B7194

Temperature controlled cabinet -10 to +60°C - 230 V, 50 Hz, 1 ph.

### ■ 78-B7194/Z

Temperature controlled cabinet -10 to +60°C - 110 V, 60 Hz, 1 ph.

This unit is required to perform all tests listed above.

## GENERAL SPECIFICATION

- Temperature range: -10 to +60°C, resolution 0.1°C
- Stainless steel AISI 304, 18/10 internal and external frame
- Three glass door
- Forced ventilation
- Closed loop PID temperature controller
- Cooling unit complete with defrost system
- Internal lightning
- Power: 2300 W
- Ex. dimensions: 580x1000x1000 mm
- Weight approx.: 150 kg

## DYNAPAVE

### INDIRECT TENSILE TEST (IDT)

#### STANDARDS

- EN 12697-24 Annex E, EN 12697-26 Annex C
- ASTM D4123
- AASHTO TP31, AASHTO TP9, AASHTO T322
- BS DD 213

#### 78-B7111

Indirect tensile test jig for 100 and 150 mm dia. Samples

#### GENERAL DESCRIPTION

The Indirect Tensile test set, complete with the suitable accessories, is the easiest method to determine stiffness and fatigue behavior of asphalt. The test jig can be easily used both for 100 mm and 150 mm diameter specimens.

► **78-B7115** Set of two LVDT 0.1 mm transducers for IDT stiffness test

► **78-B7131** Asphalt proving ring for routine check of load cell and deformation transducers

► **78-B7132** 100 mm diameter PVC specimen

► **78-B7133** 150 mm diameter PVC specimen

► **78-B7134** Torque screwdriver

► **78-B7120** Set of two LVDT 3.75 mm transducers, double ball end, for IDT fatigue test

► **78-B7122** 100 mm specimen LVDT mounting strip for IDT

► **78-B7123** 150 mm specimen LVDT mounting strip for IDT



78-B7111



Example of indirect tensile stiffness software.

### UNIAXIAL CREEP AND PERMANENT DEFORMATION TEST

#### STANDARDS

- EN 12697-25 Method A
- NCHRP 9-19 / 9-29 (Flow time), NCHRP 9-19 / 9-29 (Flow number)
- AASHTO TP79 (Flow number)
- BS DD 226
- AS 2891.12.1

#### GENERAL DESCRIPTION

The uniaxial test set is one of the reference methods for the determination of the permanent deformation properties of asphalt. The test can be carried out on both 100 mm and 150 mm diameter specimens.

#### 78-B7118

Uniaxial permanent deformation jig (Indentation test), for 150 mm dia. samples (EN 12697-25 Method A)

#### 78-B7112

Creep testing jig, 100 mm dia. samples conforming to: BS DD 226, AS 2891.12.1, NCHRP 9-19, NCHRP 9-29

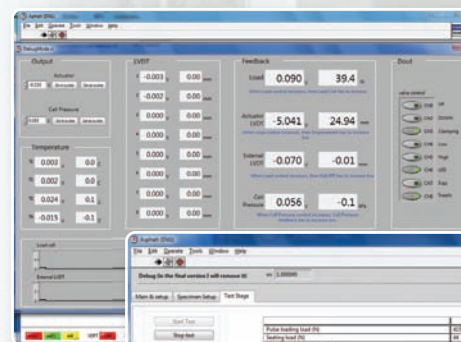
#### 78-B7113

Creep testing jig, 150 mm dia. samples conforming to: BS DD 226, AS 2891.12.1, NCHRP 9-19, NCHRP 9-29

► **78-B7114** Set of two LVDT 10 mm transducers for permanent deformation



78-B7118 with 78-B7114



Example of uniaxial permanent deformation test.

## 4-POINT BENDING

### STANDARDS

- EN 12697-24 Annex D, EN 12697-26 Annex B
- AASHTO TP8, AASHTO T321

### 78-B7181

#### Beam Fatigue module

#### GENERAL DESCRIPTION

The beam cradle has been designed to test an asphalt beam specimen under 4-point bending conforming to Standards. The specimen is positioned and clamped using pneumatically operated clamps.

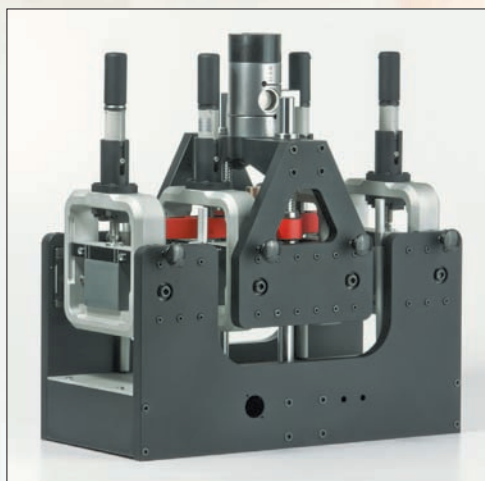
The module includes:

- Test software
- Cradle assembly and clamps for 50.8x63.5x400 to 70x70x400 mm specimens
- One LVDT displacement transducer

Overall dimensions: 580x250x530 mm (hxdxw)

Weight: 28 kg approx.

#### 78-B7171 PVC Dummy beam



78-B7181



Example of 4-point bending fatigue test.

## 2-POINT BENDING

### STANDARDS

- EN 12697-24 Annex A, EN 12697-26 Annex A

### 78-B7140

#### 2-point bending accessory suitable for use with 78-B7030 servo-hydraulic machine only

#### GENERAL DESCRIPTION

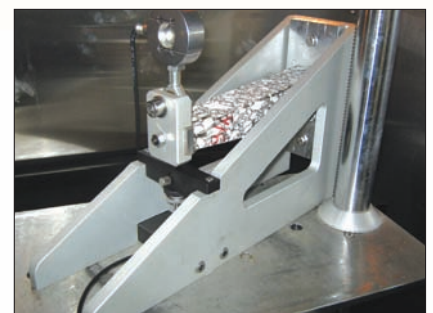
The test set basically consists of an L-shaped frame mounted on the UTM unit. A trapezoidal asphalt specimen base is rigidly connected to the UTM base, and its top is bent by the UTM actuator. The asphalt specimen is loaded with sinusoidal displacement controlled waveshape. Load and displacement are recorded and the material stiffness is calculated. If test is performed until the specimen fails (typically material stiffness decreases up to 50%), fatigue properties of asphalt are calculated.

#### 78-B7141

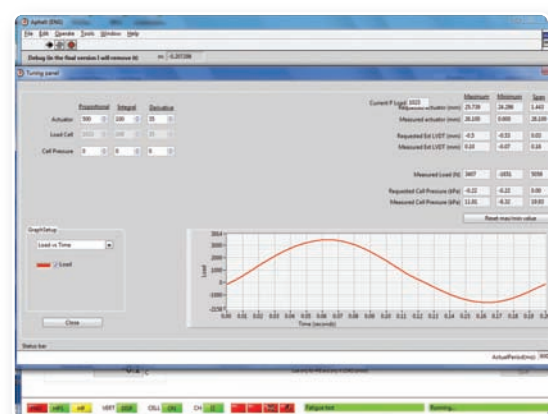
Set including one base plate and one top plate to be glued to the trapezoidal specimen to be used with 78-B7140

#### 78-B7142

Aluminium calibration beam, to perform the calibration on 78-B7140 as required by EN 12697 procedure



78-B7140



Example of 2-point bending fatigue test.

## DYNAPAVE

### TRIAXIAL TEST AND UNBOUND RESILIENT MODULUS TEST

#### STANDARDS

- EN 12697-25 Method B, EN 13286-7
- AASHTO TP 46, AASHTO T294, AASHTO T307

#### GENERAL DESCRIPTION

The triaxial test set can be used both for asphalt samples to EN 12697-25 Method B and for unbound materials to AASHTO TP46 and AASHTO T307. The triaxial cell can house specimens 100 mm dia. x 50 to 100 mm height (asphalt samples) and 100mm dia. x 200 mm height (unbound materials).

#### 78-B7160

**Standard triaxial cell for 100 mm dia. specimens**

Accessories for 78-B7160 triaxial cell

- **78-B7152** Pneumatic reservoir assembly with servo-valve (for use with servohydraulic machines only)
- **78-B7152/1** Confining cell pressure reservoir upgrade kit (for use with servopneumatic machines only)
- **78-B7153** 600 kPa pressure transducer
- **78-B7114** Two 10 mm LVDTs transducers
- **78-B7154** External axial LVDT mounting kit



**78-B7160**



*Example of unbound resilient modulus test.*

### DYNAMIC MODULUS

### (AMPT, Asphalt Mixture Performance Test - formerly SPT)

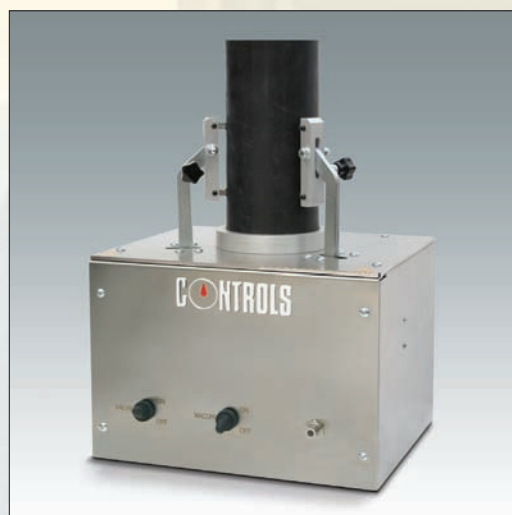
#### STANDARDS

- AASHTO TP62, AASHTO TP79
- NCHRP 9-19 / 9-29

#### GENERAL DESCRIPTION

The Dynapave range testers can be used to perform the Dynamic Modulus test, with a 100 mm dia x 150 mm high sample, cored from a 150 mm dia. gyratory compacted specimen. The sample is fit with three LVDT transducers, applied at 120° one to the other, by the following accessories.

- **78-B7175** LVDT Gauge point fixing jig
- **78-B7176** Proving ring assembly
- **78-B7177** On-specimen LVDT mounting clamps, set of 6
- **78-B7178** On-specimen LVDT (1 mm), set of 3
- **78-B7179** Gauge points, set of 24



*The 78-B7175 unit is used to position the 3 LVDT sensors on the specimen before testing.*

# Dynamic Testing Systems for Road Paving Materials

## DYNAPAVE

### 78-B7210

## Stand Alone Beam Fatigue Dynamic Apparatus

### STANDARDS

- EN 12697-26 Annex B, EN 12697-24 Annex D, AASTHO TP8, T321

### GENERAL DESCRIPTION

This apparatus has been designed to perform independently the 4-Point Beam Fatigue test.

It comprises a cradle with vertical clamping and a digital servo-controlled pneumatic actuator built into the base.

The beam cradle has been designed to test an asphalt beam specimen under 4-points bending conforming to Standard.

Two sets of pads are provided for the clamps to accommodate specimen from 50 mm to 70 mm in width.

Servo-motor driven recirculating ball screws are used to clamp the specimen vertically.

The motors are operated continuously during the test to take up the slack resulting from permanent deformation of the specimen at the clamping surfaces.

The clamping force is controlled by regulating the motor current. The apparatus is supplied complete with testing software.

**NOTE:** PC and printer not included.

| Specifications                           |                                             |
|------------------------------------------|---------------------------------------------|
| Size (hxdxw)                             | 600x250x535 mm approx.                      |
| Weight                                   | 32 kg approx.                               |
| Load capacity                            | 4.5 kN                                      |
| Actuator stroke                          | 10 mm                                       |
| On specimen displacement transducer span | 1 mm                                        |
| Loading frequency                        | up to 30 Hz                                 |
| Beam dimensions                          | 63.5x50x400 mm nominal                      |
| Air supply                               | clean dry air at 800-900 kPa;<br>5 liters/s |

► **78-B7181** PVC Dummy beam

**NOTE:** This system requires a suitable air compressor. The following model is ideal for this application.

► **86-D2015/A** Air compressor, 8 bar continuous working pressure, 10 bar max. pressure, 5.5 kw, 200 l cap. ait tank. 400 V, 50 Hz, 3 ph.

### ORDERING INFORMATION

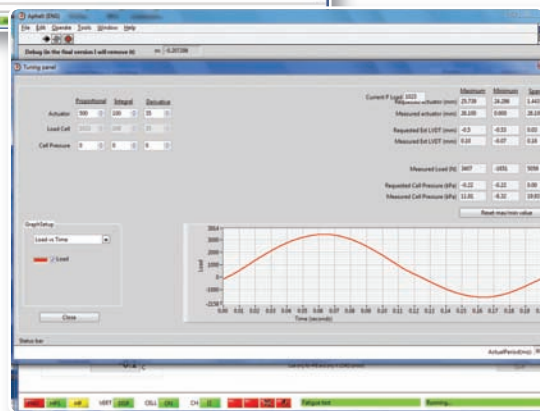
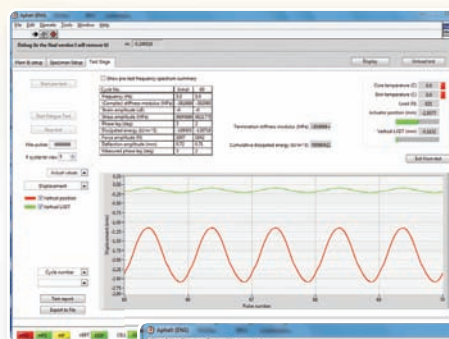
■ **78-B7210** Stand Alon Beam Fatigue Dynamic Apparatus. 110-230 V, 50-60 Hz, 1 ph.



78-B7210



CDC - Compact Dynamic Controller



Example of 4-point bending fatigue test.

# Selection of other testing machines

## GYRATORY COMPACTORS

### STANDARDS

EN 12697-10, EN 12697-31, AASHTO T321/TP4, SHRP M-002  
AASHTO T312

### GYROCOMP Series

### RESEARCH Version Series



*GYROCOMP  
76-B2522*



*Research  
version  
76-B0251*

### MAIN FEATURES

- Pneumatically operated vertical pressure
- High productivity and accuracy
- Compact and lightweight
- Certified to EN and AASHTO
- Full safety and ergonomics
- Integrated electro-mechanical extruder (GYROCOMP Series only)
- Test data on hard disk (ASCII files)
- Research version includes measurement of the shear resistance of material during compaction. Results displayed in real time
- Easy to use and to maintain
- Windows based software for result processing
- Calibrated by exclusive ILS device

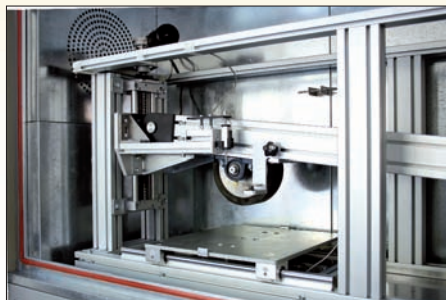
## DYNA TRACK - Wheel Tracking Apparatus

### STANDARDS

EN 12697-22



*DYNA TRACK 77-B3502*



*77-B3502 Detail of  
the loaded wheel  
mechanism*

### MAIN FEATURES

- Automatic test control by advanced Data acquisition and processing system
- Large permanent memory to store test data and results
- RS 232 ports for connection to PC and printer
- Large graphic display 240x128 pixel
- Real time display of number of cycles, rut depth and temperature
- Adjustable cycle frequency
- Double temperature measurement: inside the specimen and in the cabinet
- Auxiliary motor to lower and lift the wheel loading assembly
- Testing software included for procedures EN A and B, and custom defined

## DYNA COMP - Pneumatic Roller Compactor

STANDARDS  
EN 12697-33



DYNA COMP 77-B3602



### MAIN FEATURES

- Pneumatically powered
- Easy to maintain
- Safety enclosure
- Slabs 300x400 mm, 25 to 100 mm thick
- Compacts to target density
- Moulds easy to install and remove

## BITUMAX - Asphalt Binder Analyser

STANDARDS  
EN 12697-39, AASHTO TP53, ASTM D6307 and BS (DD)  
American National  
Centre for Asphalt  
Technology (NCAT)



BITUMAX 75-B0008

### MAIN FEATURES

- Completely automatic test cycle with simultaneous display of all the test parameters
- High efficiency heating system with additional afterburner for complete combustion of exhaust fumes, conforming to CE prescriptions
- PID closed loop temperature control
- Internal database, up to 100 tests. Each test can be displayed and printed, or downloaded to a PC
- Windows XP® compatible software to display weight/time curve, complete with database and certificate printout included

## BITUMIX - Automatic Laboratory Mixer

STANDARDS  
EN 12697-35



76-B0077/B Unloading position

### MAIN FEATURES

- Ideal to prepare laboratory samples
- Mixing capacity: 30 l
- Mixing speed adjustable from 5 to 35 rpm
- Mixing temperature adjustable up to 250°C
- Stainless steel (AISI 304) mixing container
- Temperature control by PT 100 probe
- Digital temperature display
- Easy unloading by motorized tilting system of the container

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### TECHNICAL SUPPORT - A value for the client

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DYNASPH112/R0/E/N 2.5