Pavetest is the division of Matest committed to developing innovative, dynamic and static testing systems for asphalt.

With many years of experience in developing pavement testing systems between them, Con Sinadinos (Managing Director) and Alan Feeley (Technical Director) bring a wealth of experience and talent to the company.

Con commenced his career with the Australian Road Research Board (ARRB) and in 1991 continued as Chief Engineer at IPC Global, where he was promoted to General Manager several years later. Con’s involvement in a number of National Cooperative Highway Research Program (NCHRP) projects has given him a great deal of knowledge and experience in the field of flexible pavement. The benefit is evident in every aspect of every product, which are designed to perform, built to last and easy to use.

From its inception, Pavetest’s aim is to develop a range of testing systems with unparalleled performance, ultimate versatility and exceptional reliability, at a price that represents real value for money.

Pavetest’s range of pavement testing systems both complements and completes Matest’s Asphalt and Bitumen business unit.
CDAS
CONTROL AND DATA ACQUISITION SYSTEM
Pavetest’s compact Control and Data Acquisition System (CDAS) delivers unparalleled performance, real time control and ultimate versatility in acquisition and provide a flexible and user friendly testing solution.

It provides excellent waveform fidelity from integrated acquisition and control functions, with low level sampling at speeds of up to 192,000 samples per second simultaneously on all channels and 20 bit resolution over the full dynamic input signal range.

EASY DATA PROCESSING WITH THE INCLUDED SOFTWARE
The CDAS includes the TestLab software - supplied on USB flash drive - complete with relevant Method files (based on the test configurations supplied) and calibration files for all the transducers supplied. Software and test methods are expandable for future requirements.

AVAILABLE MODELS

B205
8 Channel CDAS - Acquisition 8 CH, 20 bit resolution
- Sampling rate up to 192 kHz (all channels)
- Smoothing up to 64 times over-sampling
- Calibration on power up
- Control Axis 2
- Communication USB or Ethernet

B206
16 Channel CDAS - Acquisition 16 CH, 20 bit resolution
- Sampling rate up to 192 kHz (all channels)
- Smoothing up to 64 times over-sampling
- Calibration Automatically on power up
- Control Axis 4
- Communication USB or Ethernet

Dimensions: 110(h) x 325(d) x 265(w) mm
Power Supply: 90-264V 50-60Hz 1ph 240W
Weight: 5 kg approx.

TECHNICAL FEATURES

CONTROL:
- High speed, (18 bit) digital servo-control, up to 4 axis.
- Digital closed loop update sampling rate of 2.5 kHz.
- Computer programmable, Proportional, Integral and Derivative (PID) control algorithm.
- Adaptive Level Control (ALC) algorithm for best dynamic peak accuracy.
- 3 feedback control modes. E.g. force, position and on-specimen strain.
- “Bumpless transfer” between control modes.

ACQUISITION:
- Analog inputs are automatically calibrated on power up.
- Simultaneous sampling of all channels.
- 16 Analog (± 10 Volt) input channels.
- Up to 64 times over sampling (set to 8 by default).
- 20 bit digital resolution (approx. 1/1,000,000), no auto ranging required.
- Sampling rate up to 192,000 samples/see.
TESTLAB SOFTWARE

Developed with ultimate flexibility in mind, TestLab test and control software caters to all levels of operator experience. By using pre-programmed **Method files**, an inexperienced operator can run a range of international test methods without the need for any programming. Moreover, a test **Wizard**, available with popular tests, can guide the operator step by step based on a recipe book approach. Most importantly, the experienced engineer and/or researcher need not be constrained by the functions and analysis in the method files provided. The operator may clone, modify and/or generate his/her own method file to suit their specific requirements. The Excel based data analysis offers the operator the flexibility to implement alternative analysis and customize reporting facilities. TestLab allows for real time graphing of results and configurable real time transducer levels display with unprecedented clarity of results and analytical power.

**MAIN FEATURES**

- Open architecture software allows user to inspect calculations and results.
- Integrated data result post processing feature with MS Excel.
- Standard and user customizable test reporting.
- Real time graphing of results and configurable real time transducer.
- Flexible and user-friendly with unprecedented clarity of results and analytical power.
- Full access for advanced user to specify their own calculations, test results and charting.

**TESTLAB, A NEW APPROACH**

TestLab is an open architecture user programmable software application. Our engineers have taken the time to review all the relevant international test standards and used TestLab **Test Designer** to program method files according to these standards. Basically, any of these tests can be designed, cloned and/or modified by the user within TestLab. The user is no longer restricted to the test applications provided at time of purchase the possibilities are only limited by the skill and imagination of the user.

**TESTLAB MANAGER**

The Testlab materials testing software is a universal approach to materials testing and is designed to interface the CDAS – Control and Data Acquisition Systems - and the wide range of Pavetest machines. A Testlab Manager interface allows users to easily and efficiently locate the necessary method files to load and execute.

**TEST METHOD SELECTION**

The operator can run pre-programmed Method files, in accordance to the requested Standards, or configure an application test and then save that configuration to a customised Method file. This includes the transducer and calibration allocations, control parameters, termination conditions and any other items, which allow users to enter data. Method files may easily be “cloned”, adapted and saved to be used at a later stage with pre-set preferences.
TEST WIZARD
The wizard section provides a prompted menu approach to running a test. The user is driven to enter information throughout a series of easy steps.

TESTLAB UNIVERSAL TEST
The Test Data section displays run-time information, such as the loading time, cycle count, transducer readings (force, displacement, pressure, temperature), stress calculations, strain calculations and other test specific properties.

POST PROCESSING
All Testlab Method file tests provide the facility to send the data directly to an Excel workbook including test input and results data. This facility provides a means of efficiently post processing raw data results and customizing reports from within Excel and optionally displaying summary result in TestLab.

REAL TIME DASHBOARD DISPLAY
For the more sophisticated tests, PaveTest provides the user with an alternative, simpler and more intuitive representation of the current status of both machine and test method. This dashboard display feature of TestLab shows real time transducer levels, computed data and charted data before, during and after the test has completed.
UPGRADE YOUR UNIVERSAL TESTING MACHINE

It is a well-known fact that the controller and software is one of the most important aspect of any system and the main reason testing machines become outdated or obsolete. The original machine manufacturer often charge outrageous prices to upgrade the Control and Data Acquisition System and Software, knowing the customer has very little choice.

Pavetest has now made it easier than ever to upgrade third party servo-hydraulic/pneumatic dynamic testing machines, including but not limited to IPC Global, Controls, Cooper, Interlaken, MTS and Instron machines, to Pavetest’s leading-edge Control and Data Acquisition System (CDAS) and world acclaimed TestLab software.

**MAIN FEATURES**

- TestLab Software provides powerful and flexible solution.
- Comprehensive suite of pre-programmed Method Files.
- Ability to create your own Method Files.
- Adaptable for existing transducers.
- In-line signal conditioners.
- Interfaces to most third party Hydraulic Power Supplies.

**TESTLAB PC SOFTWARE**

- Selection of Method Files
- Test Methods
- Typical dashboard screen

**THIRD PARTY TESTING MACHINES**

- Servo Pneumatic test machine
- Servo Hydraulic test machine
- 4 PT Beam test machine
UPGRADE BENEFITS
This immediately offers the user access to a comprehensive suite of pre-programmed Method Files and/or the opportunity to create their own Method Files, to suit their individual needs. Pavetest can also provide interface cables and signal conditioners to adapt existing transducers to the Pavetest CDAS and offer additional transducers, already fitted with in-line signal conditioners to suit existing and new testing applications.

For servo-hydraulic systems; the Pavetest microprocessor controlled HPS interface unit allows Pavetest to interface our CDAS to most third party Hydraulic Power Supplies.

Our 40 plus years’ experience with servo-controlled systems and instrumentation places us in a strong position to restore your outdated system to current day standards.

MODULAR CONCEPT
Both the CDAS hardware and TestLab software use a modular approach allowing users to add new functionality to perform additional materials tests.

AVAILABLE FOR ALL LANGUAGES
TestLab has a complete inbuilt language translation editor catering for translation of all languages.

RENEWED PERFORMANCE
TestLab provides new and advanced acquisition and control capabilities for your old testing machine.

COMPLETE INSTALLATION AND TRAINING
Pavetest can provide a complete onsite installation, commissioning and training for your upgrade package including supply of additional jigs, method files and transducers.

ORDERING INFO

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>B205</td>
<td>8 channel CDAS</td>
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<tr>
<td>B206</td>
<td>16 channel CDAS</td>
</tr>
<tr>
<td>B205-01</td>
<td>HPS interface box</td>
</tr>
<tr>
<td>B205-02</td>
<td>6 pin DIN (male) to 7 pin XLR (female) adaptors cable</td>
</tr>
<tr>
<td>B205-03</td>
<td>6 pin DIN (female) to 7 pin XLR (male) adaptors cable</td>
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</table>

EXAMPLE OF SYSTEMS UPGRADED BY PAVETEST

8 Channel Pavetest CDAS with Frame Control Interface.
16 kN SERVO-PNEUMATIC DYNAMIC TESTING SYSTEM
TWO MODELS AVAILABLE:

B220-01 KIT  
DTS-16 WITH MANUAL CROSSHEAD

B220-02 KIT  
DTS-16 WITH MOTORIZED CROSSHEAD

The DTS-16 Dynamic Testing System is a servo-pneumatically controlled testing machine utilizing digital control of a pneumatic servo valve to provide accurate loading wave shapes up to 70 Hz. The DTS-16 can be operated in tension, compression dynamic loading and is suited to testing a diverse range of materials such as asphalt, soil, unbound granular materials, fibres and plastics. The DTS-16 is underpinned by Pavetest’s leading edge CDAS digital controller, TestLab software and a full complement of accessories, hardware and software in perfect unison.

<table>
<thead>
<tr>
<th>Model</th>
<th>B220-01 KIT</th>
<th>B220-02 KIT</th>
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<tbody>
<tr>
<td>B220-11</td>
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<td>B220-12</td>
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<tr>
<td>B206</td>
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<tr>
<td>B270-12</td>
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</tbody>
</table>

The machines includes:

- **B220-11**: 20 kN Load frame with manual crosshead, 16 kN Servo-pneumatic actuator with its LVDT (30 mm stroke), ± 20 kN load cell

or

- **B220-12**: 20 kN Load frame with motorized crosshead, 16 kN Servo-pneumatic actuator with its LVDT (30 mm stroke), ± 20 kN load cell

- **B206**: 16 Channel Control and Data Acquisition System (CDAS) & TestLab software

- **B270-12**: Air reservoir assembly with membrane dryer

It requires pressurized air, minimum 7 bar (not included).

**B220-02 KIT**: 16 kN Servo-Pneumatic dynamic testing system (motorized crosshead) with **B221** Temperature controlled cabinet
TECHNICAL SPECIFICATIONS

Load frame
- Between Columns 345 mm
- Vertical Space 650 mm

Servo actuator
- Capacity ± 16 kN
- Frequency up to 70 Hz
- Stroke 30 mm
- Air supply clean dry air
- Pressure 800-900 kPa
- Minimum rate up to 5 litres/sec

Power Supply:
- 90-264V 50-60Hz 1ph 240W (B220-11)
- 230V 50Hz 1ph 100W (B220-12)
- 230V 50Hz 1ph 1450W (B221)

Dimensions:
- 1262(h) x 400(d) x 470(w) mm B220-11 load frame
- 1262(h) x 400(d) x 510(w) mm B220-12 load frame
- 2170(h) x 840(d) x 760(w) mm load frame with temperature controlled cabinet

Weight:
- 80 kg load frame B220-11 load frame
- 125 kg load frame B220-12 load frame
- 160 kg temperature controlled cabinet

For test configurations and related jigs, please consult p.17-28

TECHNICAL FEATURES

- Optional motorized crosshead.
  A motorized crosshead allows an easier test set-up in terms of accessories positioning without using any extension rods.
- Latest technology.
  The DTS-16 advantage revolves around the Control Data Acquisition System (CDAS) and TestLab Software.
- Durable powder coated aluminium base plate with stainless steel work platen.
- Air reservoir assembly with membrane dryer.
  It allows a great insurance against damages to the servo-valve in case of moisture in the compressed air.

RECOMMENDED ACCESSORIES

B221    Temperature controlled cabinet: -20 °C to +70 °C to suit DTS-16 or 4PBA
B250-07 KIT Temperature measuring kit comprising:
  B292-01 Temperature transducer (-80 °C to +80 °C) (2 pieces)
  B250-10 Dummy asphalt specimen
  B250-11 100 mm “O” ring (3 pieces)
  B250-12 Thermal conducting grease (about 56 g)
H009-01EN PC complete with LCD monitor 22", keyboard, mouse, cables and installation of Testlab software

We can upgrade your existing UTM (also from other manufacturers)

For test configurations and related jigs, please consult p.17-28
B230
30 kN SERVO-HYDRAULIC DYNAMIC TESTING SYSTEM (DTS-30)

The DTS-30 Dynamic Testing System is a servo-hydraulic testing machine utilizing digital control of a high performance servo valve to provide accurate loading wave shapes up to 100 Hz. The DTS-30 can be operated in tension, compression dynamic loading and is suited to testing a diverse range of materials such as asphalt, soil, unbound granular materials, fibres and plastics. The DTS-30 is underpinned by Pavetest’s leading edge CDAS digital controller, TestLab software and a full complement of accessories, hardware and software in perfect unison. The DTS-30 Dynamic Testing System is compact, fully integrated, user and environmentally friendly.

MAIN FEATURES

- Compact, robust load frame.
- Small footprint; 90 cm x 135 cm, including hydraulic power supply and climatic chamber.
- Reaction frame embedded in the test chamber.
- Portable temperature control unit.
- Fully configurable to suit a large range of testing applications.
- Digital Servo-Hydraulic control.
- Dynaflo™ HPS provides dynamic speed control of the pump motor ensuring quiet operation.
- 4 axis control and 16 channel data acquisition as standard.

The machine includes:

- Rigid two column load frame
- 30 kN Servo-hydraulic actuator (100 mm Stroke)
- 2.2 kW Hydraulic Power Supply
- 16 Channel Control and Data Acquisition System (CDAS) & TestLab software
- Load cell (± 30 kN)
- 100 mm actuator LVDT
TECHNICAL SPECIFICATIONS

Load frame
- Between Columns 600 mm
- Vertical Space 800 mm

Servo actuator
- Capacity ± 30kN static, ± 25kN dynamic
- Frequency up to 100Hz
- Stroke 100 mm

Hydraulic Power Supply
- Pressure up to 160 bar, user defined
- Flow rate up to 7.5 litres/min
- Dimensions: 650(h) x 550(d) x 450(w) mm
- Power Supply: 230V 50-60Hz 1ph 2.5kW

Power Supply:
- 230V 50-60Hz 1ph 2.5kW (B230)
- 230V 50Hz 1ph 1.3kW (B231)
- 230V 50Hz 1ph 3.1kW (B232)

Dimensions:
- 2100(h) x 1220(d) x 800(w) mm load frame
- 2100(h) x 1800(d) x 800(w) mm with temperature controlled cabinet

Weight:
- 430 kg approx. load frame
- 650 kg approx. load frame with temperature controlled cabinet and oil-filled HPS

TECHNICAL FEATURES

- The DTS-30 fatigue rated, servo-hydraulic actuator utilizes metal labyrinth bearings and seals. The labyrinth bearings and seals are designed to reduce friction and maintain low operating temperatures. The bearings experience little-to-no wear, operate at high speeds and offer a long service life.
- A bottom loading machine. Before this current crop of universal testing machines, many dynamic testing machines were bottom loading. More recently, the Asphalt Mixture Performance Tester (AMPT) changed the mindset of the testing community by highlighting the benefits of a bottom loading machine.
- Portable temperature control unit. The temperature control unit attaches to the test chamber using a magnetic seal and can be wheeled away when not required or for servicing. It can be removed without dismantling the machine or disrupting the testing program.

NEEDED ACCESSORIES

B231 Temperature controlled cabinet:
- -20 °C to +80 °C to suit DTS-30 or DTS-130

or

B232 Temperature controlled cabinet:
- -40 °C to +80 °C to suit DTS-30 or DTS-130

B233 Temperature controlled cabinet:
- -50 °C to +100 °C to suit DTS-30 or DTS-130

These temperature controlled cabinets may be supplied with humidity control, if required.

RECOMMENDED ACCESSORIES

H009-01EN PC complete with LCD monitor 22", keyboard, mouse, cables and installation of Testlab software

B250-07 KIT Temperature measuring kit comprising:
- B292-01 Temperature transducer (-80 °C to +80 °C) (2 pieces)
- B250-10 Dummy asphalt specimen
- B250-11 100 mm O ring (3 pieces)
- B250-12 Thermal conducting grease (about 56 g)

We can upgrade your existing UTM (also from other manufacturers)
For test configurations and related jigs, please consult p. 17-28
WHAT MAKES IT DIFFERENT MAKES IT BETTER!

The DTS-30 is Universal Testing Machine (UTM), but not as most people know it. It does not conform to the “me too” attitude of most UTM manufacturers. The innovations featured on the DTS-30 are built on many years of experience, developing, studying and using various universal testing machines from a number of manufacturers.

The first thing you will notice about the DTS-30 is the absence of a reaction frame. The reaction frame most certainly exists, but it’s embedded in the test chamber. Since it is mandatory to control the test temperature of most pavement materials, e.g. asphalt, the test chamber is insulated and forms part of the temperature controlled cabinet.

Most UTM manufacturers opt for an elaborate (and expensive) moveable crosshead, only to find that its range (and usefulness) is limited by the climatic chamber. The DTS-30 has a remotely positioned reaction shaft that adjusts the work space. However, you won’t need to adjust it often because the servo-hydraulic actuator has 100 mm of stroke.

**DYNAFLO™HPS**

The speed of the pump motor is controlled using a variable-frequency drive (VFD), or inverter. This enables the motor to be slowed down, or turned off, when the oil flow from the pump exceeds the flow required by the actuator at any given time.

**QUIET**

The servo-hydraulic testing machine is almost silent during the majority of test applications. The equipped Dynaflo-Hps not only reduces noise and heat generation but also offers cost savings, by reducing power consumption.

**DESIGN SOLUTION**

A neat, compact and integrated solution where the reaction frame is embedded in the test chamber, for a very sleek appearance. Moreover, short hydraulic hoses connect the actuator to the HPS that’s tucked neatly away behind the machine, under the test chamber.

**EASY MAINTENANCE**

The portable temperature control unit makes servicing, replacing or upgrading the control unit virtually effortless.

**DIRECT COMMUNICATION**

The test temperature and/or ramp rate may be set and monitored through TestLab software, via the virtual pendant.
B240 VFD
130 kN SERVO-HYDRAULIC DYNAMIC TESTING SYSTEM (DTS-130)

The DTS-130 Dynamic Testing System is a servo-hydraulic testing machine utilizing digital control of a high performance servo valve to provide accurate loading wave shapes up to 100 Hz. The DTS-130 is Pavetest’s highest capacity Dynamic Testing System and completes the range of standard universal testing machines. The system can be operated in tension, compression dynamic loading and is suited to testing a diverse range of engineering materials and/or large asphalt specimens at very cold temperatures. The DTS-130 is underpinned by Pavetest’s leading edge CDAS digital controller, TestLab software and a full complement of accessories, hardware and software in perfect unison.

The machine includes:
- Rigid two column load frame
- 130 kN Servo-hydraulic actuator (100 mm Stroke)
- 10 kW Hydraulic Power Supply
- 16 Channel Control and Data Acquisition System (CDAS) & TestLab software
- Load cell (± 130 kN)
- 100 mm actuator LVDT

MAIN FEATURES
- Robust two column load frame.
- Double acting servo hydraulic, equal area type with low friction, long life bearings and seals.
- Portable temperature control unit.
- Fully configurable to suit a large range of testing applications.
- Digital Servo-Hydraulic control.
- Dynaflo™ HPS variable frequency drive (VFD) provides dynamic speed control of the pump motor ensuring quiet operation.
- 4 axis control and 16 channel data acquisition as standard.
**TECHNICAL SPECIFICATIONS**

**Load frame:**
- Horizontal Space: 60 cm
- Vertical Space: 100 cm

**Servo actuator:**
- Capacity: ± 130kN Static ± 100kN Dynamic
- Frequency: Up to 100Hz
- Stroke: 100 mm

**Hydraulic Power Supply:**
- Pressure: Up to 210 bar, user defined
- Flow rate: 20 litres/min
- Dimensions: 1150 (h) x 600 (d) x 1100 (w) mm
- Power supply: 380V 50Hz or 208V 60Hz 12kW 3ph

**Power Supply:**
- 380V 50Hz 3ph + neutral 12kW or
- 208V 60Hz 3ph + 12kW (B240 VFD)
- 230V 50Hz 1ph 1.3kW (B231)
- 230V 50Hz 1ph 3.1kW (B232)

**Dimensions:**
- 3005 (h) x 1070 (d) x 1090 (w) mm load frame
- 3005 (h) x 1630 (d) x 1090 (w) mm with temperature controlled cabinet

**Weight:**
- 680 kg approx. load frame
- 1360 kg approx. load frame with temperature controlled cabinet and oil-filled HPS

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**ACCESSORIES**

| B240-04 | Chiller for water refrigeration (recommended) |
| B240-05 or B240-06 | Set of hoses to connect frame - pumping unit Lg. 3 m (needed) | Set of hoses to connect frame - pumping unit Lg. 8 m |
| B240-07 or B240-08 | Set of hoses to connect pumping unit - Exchanger oil/air Lg. 5 m (needed) | Set of hoses to connect pumping unit - Exchanger oil/air Lg. 10 m |
| B240-09 or B240-10 | Set of hoses to connect Exchanger oil/water - Chiller Lg. 5 m (recommended) | Set of hoses to connect Exchanger oil/water - Chiller Lg. 10 m |

* (complete with set of hoses to connect pumping unit Exchanger oil/water)

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The Hydraulic Power Supply (HPS) utilizes a variable flow pump with a working pressure up to 210 Bar. The customer can choose either water (heat exchanger) or air (Electric fan) oil cooling. Features include; low oil, over temperature and dirty filter indication, remote starting and user selectable working pressure (via TestLab).

**B231**
- Temperature controlled cabinet:
  - -20 °C to +80 °C to suit DTS-30 or DTS-130

**B232**
- Temperature controlled cabinet:
  - -40 °C to +80 °C to suit DTS-30 or DTS-130

**B233**
- Temperature controlled cabinet:
  - -50 °C to +100 °C to suit DTS-30 or DTS-130

These temperature controlled cabinets may be supplied with humidity control, if required.

We can upgrade your existing UTM (also from other manufacturers)

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**RECOMMENDED ACCESSORIES**

**H009-01EN**
- PC complete with LCD monitor 22”, keyboard, mouse, cables and installation of Testlab software

**B250-07 KIT**
- Temperature measuring kit (refer to p. 9)

For test configurations and related jigs, please consult p. 17-28
PAVEMENT TECHNOLOGY

TWO PIECE TEMPERATURE CONTROLLED CABINET

Pavetest offers a range of temperature controlled cabinet to complement our DTS-30 and DTS-130 servo-hydraulic Dynamic Testing Systems (DTS). Pavetest is the first manufacturer to adopt a two piece temperature controlled cabinet; comprising an insulate cabinet and a temperature control unit. The cabinet is permanently mounted on the dynamic testing machines, whilst the temperature control unit can be wheeled away when not required, leaving the back of the chamber open to accommodate longer jigs/specimens that do not require a controlled environment. The temperature control unit attaches to the cabinet using a magnetic seal. This isolates the cabinet from mechanical vibrations caused by the refrigeration unit and circulation fans whilst maintaining an air tight seal between the inside and outside of the chamber. This concept also makes servicing, replacing or upgrading the temperature control unit virtually effortless, because it can be removed without dismantling the machine or disrupting the testing program.

MAIN FEATURES

- Two piece concept makes servicing, replacing or upgrading the temperature control unit effortless.
- Flexible temperature sensor ensures the temperature near the specimen is accurately controlled.
- Operator can monitor, set, adjust or “Auto tune” the temperature controller via the PC.
- Heavy duty stainless steel construction.
- Powerful re-circulation fans ensure even temperature throughout the chamber.
- Triple Glazed, Argon filled, Lo E glass door with built in heater.
Pavetest has introduced some additional features to improve the functionality of our temperature controlled cabinets. The sensor for the temperature controller is mounted on a flexible arm which allows the operator to locate the sensor in the vicinity of the test specimen; providing accurate temperature control where it’s needed most; right near the specimen.

The cabinet is permanently mounted on the DTS.

The back of the chamber is open to accommodate longer jigs.

Attatched using magnetic seal.

It can be easily removed for servicing or upgrading.

It isolates vibrations from the compressor.

The temperature control can be wheeled away.

Other temperature ranges and operating voltage/frequency available on request.

The temperature controller can be programmed using the virtual pendant within TestLab software, via a serial link between the temperature controller and the Control and Data Acquisition System (CDAS). This allows the operator to monitor, set or adjust a constant temperature or ramp without touching the temperature controller, including invoking the “Auto tune” function. This feature is particularly useful for the TSRST test, where programming the temperature controller is not a simple task.
The following pages describe specific testing kits to perform dynamic tests on asphalt mixture and other pavement materials, by using our range of DTS’s Dynamic Testing Systems: DTS-16, DTS-30 and DTS-130. These kits have to be integrated with various additional items, in order to obtain a complete assembly.
B250 KIT
Indirect Tensile Modulus - IDTM

STANDARDS:
- AASHTO TP31 Resilient modulus of bituminous mixtures by indirect tension
- ASTM D4123 Indirect Tension Test for Resilient Modulus of Bituminous Mixtures
- AS/NZS 2891.13.1 Resilient modulus of asphalt - Indirect tensile method
- EN 12697-26 Annex C - Indirect tension to cylindrical specimens (IT-CY)

B251 KIT
Indirect Tensile Fatigue - IDTF

STANDARD: EN 12697-24 Annex E – Indirect tensile test on cylindrical shaped specimens

TEST FRAMES
- Manual DTS-16 | Motorized DTS-16 (B221)
- DTS-30 | DTS-130 (B231 or B232)

TEST FRAMES
- Manual DTS-16 | Motorized DTS-16 (B221)
- DTS-30 | DTS-130 (B231 or B232)

ACCESSORIES
- B250-03 Asphalt proving ring
- B250-04 100 mm diameter PVC specimen
- B250-05 150 mm diameter PVC specimen
- B250-06 KIT Torque screwdriver (B250-13) with hexagonal head 4 mm (B250-14)

ACCESSORIES
- B251-51 Pair of LVDT mounting strip to suit 100 mm specimen (needed accessory)
  And/or
- B251-52 Pair of LVDT mounting strip to suit 150 mm specimen (needed accessory)
- B201-52 5 Minute, two part epoxy 24 ml
B260 KIT
Uniaxial cyclic compression - UCC
STANDARD: EN 12697-25 Cyclic compression. Test Method A - Uniaxial cyclic compression test with confinement
TP Asphalt-STB 25A1: Dynamic punching test on mastic asphalt
TP Asphalt-STB 25A2: Dynamic punching test on rolled asphalt

B260 KIT Uniaxial cyclic compression
Comprises:
B260-01 Base assembly
B260-02 Chamfered top platen
B290-02 LVDT (10 mm) (2 pieces)

TEST FRAMES
Manual DTS-16 | Motorized DTS-16 (B221)
DTS-30 | DTS-130 (B231 or B232)

B260-10
PULL OFF TENSION JIG
STANDARD: TP Asphalt-STB – Part 81, Adhesive pull strength of thin asphalt layers

TEST FRAMES
DTS-30 (B231 or B232)

B260-10 Pull off tension jig

ACCESSORY
B261-01 DTS-30 Tension base (needed)
B253 KIT
Indirect Tensile modulus, creep compliance and strength using on-specimen transducers - IDTOS
STANDARDS:  
ASTM D7369 Resilient Modulus of Bituminous Mixtures by Indirect Tension Test
AASHTO T322 Creep Compliance and Strength of Hot-Mix Asphalt (HMA) Using the Indirect Tensile Test Device

B253 KIT
Indirect Tensile modulus, creep compliance and strength using on-specimen transducers
Comprises:
B250-01 Basic IDT Jig
B253-01 AASHTO T322 LVDT mounting Jig
B290-04 Miniature LVDT (1 mm) (4 pieces)
B253-02 AASHTO T322 gauge point template (100 mm specimen)
B253-03 AASHTO T322 gauge point template (150 mm specimen)

ACCESSORIES
B253-53 Gauge point (24 needed pieces)
B201-52 5 Minute, two part epoxy 24 ml

B212
Four Point Bending for use with Pavetest B230 - 4PB
STANDARDS:  
AASHTO T 321 Fatigue Life of Compacted Hot-Mix Asphalt (HMA) Subjected to Repeated Flexural Bending
ASTM D7460 Fatigue Failure of Compacted Asphalt Concrete Subjected to Repeated Flexural Bending
AG-PT/T233 & ASTM 03 Fatigue life of compacted bituminous mixes subject to repeated flexural bending
EN 12697-24 Annex D - Four point bending test on prismatic shaped specimens
EN 12697-26 Annex B - Four point bending test on prismatic specimens (4PB-PR)

TEST FRAMES
Manual DTS-16 | Motorized DTS-16 (B221)
DTS-30 | DTS-130 (B231 or B232)

ACCESSORIES
B210-02 4PB PVC Beam
B210-03 4PB Reference beam

TEST FRAMES
DTS-30 (B231 or B232)
**B280 KIT**

**TWO POINT BENDING (2PB) TO SUIT B230 - 2PB**

STANDARDS:  
- EN 12697-24 Annex A - Two-point bending test on trapezoidal shaped specimens (2PB-TR)  
- EN 12697-26 Annex A - Two point bending test on trapezoidal specimens (2PB-TR)

**Comprises:**
- **B280-01** 2PB Jig
- **B280-51** 2PB Mounting plate (25 mm apex)
- **B280-52** 2PB Mounting plate (50 mm apex)
- **B280-53** 2PB Mounting plate (base)

**ACCESSORIES**
- **B290-05** LVDT (2 mm) *(needed accessory)*
- **B280-02** Two point Bending (2PB) gluing jig *(needed accessory)*
- **B201-52** 5 Minute, two part epoxy 24 ml

**TEST FRAMES**
- DTS-30 (B231 or B232)

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**B261 KIT**

**Permanent deformation - PD**

STANDARD:  
- AS/NZS 2891.12.1 Determination of the permanent compressive strain characteristics of asphalt - Dynamic creep test  
- TP Asphalt-StB – Part 25B Uniaxial pressure-fatigue testing. Determination of deformation behavior of roller asphalt during heat

**Comprises:**
- **B260-01** Base assembly
- **B260-03** 100 mm top platen
- **B290-02** LVDT (10 mm) (2 pieces)

**ACCESSORY**
- **B260-04** 150 mm top platen

**TEST FRAMES**
- Manual DTS-16 | Motorized DTS-16 (B221)  
- DTS-30 | DTS-130 (B231 or B232)
B255 KIT
Dynamic modulus - \( E^* \)
STANDARD: AASHTO T342 Determining Dynamic Modulus of Hot Mix Asphalt (HMA)

Test Frames
DTS-30 | DTS-130 (B231 or B232)

**Dynamic Modulus on Small Specimens | DTS-30/130**

To test 38 mm (diameter) x 110 mm (h) specimens with DTS-30/130, the following items are required:

- **B200-05** Bottom loading platen for 38 x 110 mm (Ø x h) specimen
- **B200-06** Top loading platen for 38 x 110 mm (Ø x h) specimen
- **B253-04** AASHTO T342 LVDT mounting jig (3 pieces)
- **B290-06** LVDT (1 mm) (3 pieces)
- **B253-05** Screwdriver hex bit with spherical head size 2 mm
- **B202** Gauge Point Fixing Jig
- **B202-02** Spacer for 110 mm specimen height to be used with gauge point fixing jig B202
- **B202-03** 38 mm and 50 mm diameter specimen - extension for gauge point fixing jig plungers B202
- **B203** Dynamic Verification Device (optional)
- **B201-52** 5 Minute, two part epoxy 24 ml (optional)

To test 50 mm (diameter) x 135 mm (h) specimens with DTS-30/130, the following items are required:

- **B200-07** Bottom loading platen for 50 x 135 mm (Ø x h) specimen
- **B200-08** Top loading platen for 50 x 135 mm (Ø x h) specimen
- **B253-04** AASHTO T342 LVDT mounting jig (3 pieces)
- **B290-06** LVDT (1 mm) (3 pieces)
- **B253-53** AASHTO T342 gauge point (24 needed pieces)
- **B253-05** Screwdriver hex bit with spherical head size 2 mm
- **B202** Gauge Point Fixing Jig
- **B202-01** Spacer for 135 mm specimen height to be used with gauge point fixing jig B202
- **B202-03** 38 mm and 50 mm diameter specimen - extension for gauge point fixing jig plungers B202
- **B203** Dynamic Verification Device (optional)
- **B201-52** 5 Minute, two part epoxy 24 ml (optional)
B271 KIT
Cyclic triaxial compression - CCT
STANDARD: EN 12697-25 Cyclic compression. Test Method B - Triaxial cyclic compression test

TEST FRAMES
Manual DTS-16 | Motorized DTS-16 (B221)
DTS-30 | DTS-130 (B231 or B232)

B271 KIT Cyclic triaxial compression
Comprises:
B270-01 Triaxial cell, suitable for Ø 100 mm, up to 200 mm height specimens
B270-02 Triaxial cell external LVDT mounting jig
B293-01 Pressure transducer (± 300 kPa)
B270-06 110 mm diameter top loading platen for EN 12697-25B
B270-15 110 mm diameter base pedestal for 100 mm height specimen

ACCESSORIES
B290-02 Displacement transducer (10 mm) (2 pieces needed)
B270-04 Air reservoir assembly confining pressure upgrade kit (needed accessory for DTS-16)
or
B270-03 Air reservoir assembly with confining pressure control (needed accessory for DTS-30/130)
B270-17 Ø 200 mm base plate (needed accessory for DTS-30)
B270-18 Membrane stretcher for asphalt specimen Ø 100 mm
B201-53 Ø 100 mm rubber membrane 0.3 mm thickness (pack of 10)
S311-03 Ø 100 mm sealing ring (10 pieces)
S316-03 Ø 100 mm porous disc (2 pieces) needed for AASHTO T307
Requires pressurized air, minimum 7 bar (not included)

B272 KIT
Triaxial resilient modulus - TRM
STANDARD: AASHTO T307 Determining the resilient modulus of soils and aggregate materials

TEST FRAMES
Manual DTS-16 | Motorized DTS-16 (B221)
DTS-30 | DTS-130 (B231 or B232)

B272 KIT Triaxial resilient modulus
Comprises:
B270-01 Triaxial cell, suitable for Ø 100 mm, up to 200 mm height specimens
B270-02 Triaxial cell external LVDT mounting jig
B293-02 Pressure transducer (± 600 kPa)
S315-07 100 mm diameter bottom platen
S314-03 100 mm diameter top platen

ACCESSORIES
Same accessories of B271 KIT
B274-KIT
Triaxial testing kit

STANDARDS: AASHTO TP 79-09 Standard Method Test for Determining the Dynamic Modulus and Flow Number for Hot Mix Asphalt (HMA)
AASHTO T378 Standard Method of Test for Determining the Dynamic Modulus and Flow Number for Asphalt Mixtures

B274 KIT Triaxial testing Kit
Comprises:
B270-01 Triaxial cell, suitable for Ø 100 mm x up to 200 mm tall
B293-01 Pressure transducer (± 300kpa)
B200-03 105 mm top loading platen
B270-16 Ø 105 mm base pedestal for 150 mm height specimen

ACCESSORIES
B200-01 AMPT LVDT 2.00 mm (3 needed)
B270-04 Air reservoir assembly confining pressure upgrade jig (needed for DTS-16)
or B270-03 Air reservoir assembly with confining pressure control (needed for DTS-30/130)
B253-53 AASHTO T342 gauge point (24 pieces needed)
B201-52 5 minute, two part epoxy 24 ml
S311-03 Sealing ring Ø 100 mm
B201-53 100 mm rubber membrane 0.3 mm thickness (pack of 10)
B202 Gauge point fixing jig
B203 AMPT dynamic verification device
B200-10 Latex membrane material cut in Ø 100 mm discs (needed for AASHTO T378)
Requires pressurized air, minimum 7 bar (not included)

TEST FRAMES
Manual DTS-16 | Motorized DTS-16 (B221)
DTS-30 | DTS-130 (B231 or B232)

B254 KIT
Semi-Circular Bending - SCB

STANDARD: EN 12697-44 Tensile Strength and Fracture Toughness-Crack Propagation

B254 KIT EN SCB testing kit
Comprises:
B254-01 SCB jig
B254-51 Pair of SCB wear plates

ACCESSORIES
B250-01 Basic Indirect Tensile Jig (needed accessory)
B290-07 Deformation gauge
B290-02 Displacement transducer (10 mm) (2 optional pieces)

TEST FRAMES
Manual DTS-16 | Motorized DTS-16 (B221)
DTS-30 | DTS-130 (B231 or B232)
B254-02 KIT
AASHTO | ASTM SCB testing kit

STANDARDS:
- AASHTO TP 124 Determining the fracture potential of asphalt mixtures using semicircular bend geometry (SCB) at intermediate temperature
- ASTM D8044 Evaluation of asphalt mixture cracking resistance using the semi-circular bend test (SCB) at intermediate temperature
- AASHTO TP105 Determining the fracture energy of asphalt mixtures using the semicircular bend geometry (SCB)

Comprises:
- B208 SCB frame
- B254-10 Roller support
- B254-02 Springs and roller

TEST FRAMES
DTS-30 | DTS-130

OPTIONAL ACCESSORIES for AASHTO TP 124, ASTM D8044
- B290-02 LVDT (10mm) (1 or 2)
- B254-11 LVDT mounting assembly (q,ty according to B290-02)
- B254-12 Positioning device

NEEDED ACCESSORIES for AASHTO TP105
- B254-13 Gauge point template
- B254-14 LVDT mounting hardware (2 needed)
- B254-15 LVDT mounting frame (2 needed)
- B253-53 Gauge point (2 needed)
- B290-05 LVDT 2.00 mm (2 needed) or B290-06 LVDT 1.00 mm (2 needed)
- B290-07 SCB deformation gauge or B290-16 Epsilon (model 3541) clip-on gauge CMOD transducer -1/+2.5 mm + C090-18 Knife edge (pack of 24 only for B290-16)
B282 KIT
Thermal Stress Restrained Specimen Test - TSRST
STANDARDS: AASHTO TP10 Thermal Stress Restrained Specimen Tensile Strength
EN 12697-46 Low Temperature Cracking and Properties by Uniaxial Tension
TP Asphalt-StB 46A Cold properties: uniaxial tensile stress test and thermal stress
restrained specimen test

B282 KIT Thermal Stress Restrained Specimen Test
Comprises:
B282-01 TSRST Temp Transducer (-80°C to +80°C) (3 pieces)
B282-02 Rod End (2 pieces)
B282-03 Clevis Yoke and Pin (2 pieces)
B282-04 Platen (2 pieces)
B282-05 LVDT Holder (2 pieces)
B282-06 Invar Rod (250 mm long) (2 pieces)
B282-07 Multi tack adhesive squares

ACCESSORIES
B290-09 Displacement transducer (5 mm) (2 pieces needed)
B261-01 B230 tension base (needed accessory for DTS-30)
B282-08 TSRST specimen gluing jig (1 piece needed)
B201-52 5 minute, two part epoxy 24 ml

TEST FRAMES
DTS-30 | DTS-130 (B232)

B284-01
Disk Shaped Compact Tension Test Kit - DC(T)
STANDARD: ASTM D7313-07a Determining fracture energy of asphalt aggregate mixtures using the disk-shaped compact tension geometry

B284-01 Disk Shaped Compact Tension Test Kit

ACCESSORIES
B261-01 B230 tension base (needed accessory for DTS-30)
B290-07 Deformation gauge (needed accessory)
or
B290-12 Epsilon Clip-On gauge 12.5 mm +1/-7 mm (needed accessory)
C090-18 Knife edge (Pack of 24) only for B290-12

TEST FRAMES
DTS-30 | DTS-130 (B231 or B232)
B264 KIT
Direct tension testing kit - DTT

STANDARDS:
EN 12697-26 Annex E - Test applying direct tension to cylindrical specimens (DT-CY) or to prismatic specimens (DT-PR)
EN 12697-26 Annex D - Direct tension-compression test on cylindrical specimens (DTC-CY)
AASHTO TP 107-14 Standard Method of Test for Determining the Damage Characteristic Curve of Asphalt Mixtures from Direct Tension Cyclic Fatigue Tests

TEST FRAMES
DTS-30 | DTS-130 (B232)

ACCESSORIES
B253-04 LVDT mounting (3 pieces needed) jig
B290-06 LVDT (1 mm) (3 pieces needed)
B253-05 Screwdriver hex bit with spherical head size 2 mm
B201-52 5 Minute, two part epoxy 24 ml
B202 Gauge point fixing jig
B202-04 Spacer for 130 mm specimen height to be used with B202 (optional)
B253-53 Gauge Point (24 pieces)
B261-01 B230 tension base (needed accessory for DTS-30)

AASHTO TP 107-14 ON SMALL SPECIMENS | DTS-30/130

To test 38 mm (diameter) x 110 mm (h) specimens with DTS-30/130 unit, the following items are required:
B200-11 38MM AMPT tension platen (2 pieces needed)
B261-02 Spherical seat coupling
B202 Gauge Point Fixing Jig
B202-02 Spacer for 110 mm specimen height to be used with gauge point fixing jig B202
B202-03 38 mm and 50 mm diameter specimen - extension for gauge point fixing jig plungers B202
B253-04 LVDT mounting (3 pieces needed) jig
B290-06 LVDT (1 mm) (3 pieces needed)
B253-05 Screwdriver hex bit with spherical head size 2 mm
B201-52 5 Minute, two part epoxy 24 ml
B253-53 Gauge Point (24 pieces)

To test 50 mm (diameter) x 135 mm (h) specimens with DTS-30/130 unit, the following items are required:
B200-12 50MM AMPT tension platen (2 pieces needed)
B261-02 Spherical seat coupling
B202 Gauge Point Fixing Jig
B202-01 Spacer for 135 mm specimen height to be used with gauge point fixing jig B202
B202-03 38 mm and 50 mm diameter specimen - extension for gauge point fixing jig plungers B202
B253-04 LVDT mounting jig (3 pieces needed)
B290-06 LVDT (1 mm) (3 pieces needed)
B253-05 Screwdriver hex bit with spherical head size 2 mm
B201-52 5 Minute, two part epoxy 24 ml
B253-53 Gauge Point (24 pieces)
B204 KIT
Overlay kit according to ASTM WK26816
STANDARD: ASTM WK26816 New Test Method for Determining the Susceptibility of Asphalt Mixtures to Cracking

NEEDED ACCESSORIES
B261-01 DTS-30 tension base
B261-02 Spherical seat coupling
B290-05 LVDT 2.00 mm or B290-06 LVDT 1.00 mm

TEST FRAMES
Manual DTS-16 | Motorized DTS-16 (B221)
DTS-30 | DTS-130 (B231 or B232)

B204-01 KIT
Overlay kit according to TEX-248-F
STANDARD: TxDOT Designation. TEX-248-F Test Procedure for Overlay Test

NEEDED ACCESSORIES
B261-01 DTS-30 tension base
B261-02 Spherical seat coupling
B290-05 LVDT 2.00 mm or B290-06 LVDT 1.00 mm

TEST FRAMES
Manual DTS-16 | Motorized DTS-16 (B221)
DTS-30 | DTS-130 (B231 or B232)

B204 KIT Overlay kit according to ASTM WK26816
Comprises:
B204-01 Overlay jig
B204-02 Pair of overlay tester (OT) specimen plates
B204-03 OT specimen preparation jig according to ASTM WK26816

B204-01 KIT Overlay kit according to TEX-248-F
Comprises:
B204-01 Overlay jig
B204-02 Pair of overlay tester (OT) specimen plates
B204-13 OT specimen preparation jig according to TEX-248-F
B210 KIT
STAND-ALONE SERVO-PNEUMATIC FOUR POINT BENDING (4PB) SYSTEM

The Pavetest Servo-pneumatic Four Point Bending (4PB) System is a servo-pneumatic testing machine utilizing digital control of a high performance servo valve to provide accurate loading wave shapes up to 60Hz. The 4PB system can be operated in haversine or sinusoidal, controlled stain or sinusoidal controlled stress mode to determine the flexural stiffness/modulus and resistance to fatigue of asphalt beams of various sizes.

B210 KIT comprises:
- B210-01  Servo-pneumatic Four Point Bending (4PB) Device with 10 mm actuator LVDT, ± 5 kN load cell, and 2 mm On-specimen LVDT
- B205 8 Channel Control and Data Acquisition System (CDAS) & TestLab software
- B270-12 Air reservoir assembly with membrane dryer

It requires pressurized air, minimum 7 bar (not included)
The 4PB System is underpinned by Pavetest’s leading edge CDAS digital controller, TestLab software and a full complement of accessories, hardware and software in perfect unison.

**TECHNICAL SPECIFICATIONS**

**Load frame**
- Outer clamp span 355.5 mm (14”) and 420 mm
- Nominal beam size(s): 50 mm (h) x 50 mm (w)
  - 50 mm (h) x 63.5 mm (w)
  - 70 mm (h) x 70 mm (w)
  - 70 mm (h) x up to 85 mm (w)

**Servo actuator**
- Capacity ± 5 kN
- Frequency Up to 60Hz;
- Stroke 10 mm
- Air supply clean dry air
- Pressure 800-900 kPa
- Minimum rate up to 5 litres/sec

**On-specimen transducer**
- Range ± 1 mm
- Resolution 0.0002 μm
- Accuracy Better than 5 μm

**Power Supply:**
- 90-264V 50/60Hz 1ph 240W (B210 KIT)
**Dimensions:**
- 590(h) x 250(d) x 570(w) mm (B210-01)
- 410(h) x 250(d) x 570(w) mm (B212)
**Weight:**
- 45 kg approx. (B210-01)
- 35 kg approx. (B212)

**NEEDED ACCESSORIES**

- **B210-02** 4PB PVC Beam
- **B210-03** 4PB Reference beam
- **B250-07 KIT** Temperature measuring kit comprising:
  - **B292-01** Temperature transducer (-80 °C to +80 °C) (2 pieces)
  - **B250-10** Dummy asphalt specimen
  - **B250-11** 100 mm O ring (3 pieces)
  - **B250-12** Thermal conducting grease (about 56 g)

**RECOMMENDED ACCESSORIES**

- **B221** Temperature controlled cabinet: -20 °C to +70 °C to suit DTS-16 or 4PBA
- **H009-01EN** PC complete with LCD monitor 22”, keyboard, mouse, cables and installation of Testlab software

4PBA on DTS16:
- **B210-01** Servo-pneumatic Four Point Bending (4PB) device with 10 mm actuator LVDT, ± 5 kN load cell and 2 mm Onspecimen LVDT (sharing CDAS with DTS 16)
  It requires pressurized air (not included).

4PBA on DTS30:
- **B212** 4PB JIG (sharing CDAS with DTS 30)

4PBA on DTS130:
- **B210-01** Servo-pneumatic Four Point Bending (4PB) device with 10 mm actuator LVDT, ± 5 kN load cell and 2 mm Onspecimen LVDT (sharing CDAS with DTS 130)
  **B270-12** Air reservoir assembly with membrane dryer
  It requires pressurized air (not included).
The specimen is securely clamped using servo-motor driven ball screws to maintain the prescribed clamping force and accommodate any compliance of the specimen between the clamping surfaces, during the test. The clamping force is controlled by regulating the motor current.

An on-specimen (LVDT) displacement transducer is used to measure and control the deflection at the centre of the beam with respect to the outer load/reaction points, as prescribed in the relevant standards.

A low profile, high performance stainless steel ring torsion load cell is used to measure and control the load.

Inner and outer clamp control switches, located on the front of the device, are used to activate and release the inner and outer specimen clamps. The four specimen yokes provide backlash free rotation and translation at all load and reaction points.

The servo-pneumatic system uses a bottom loading pneumatic actuator coupled to a high performance servo valve, with PID closed-loop control and run time adaptive control to achieve/maintain the requested strain/stress for the duration of the test.
B200 | B200L
ASPHALT MIXTURE PERFORMANCE TESTER
COMPACT, FULLY SELF CONTAINED, PRECISION ENGINEERED UNIT

The Pavetest AMPT is a servo-hydraulically controlled testing machine specifically designed to perform the three asphalt tests developed under NCHRP Projects 9-19 and 9-29; Dynamic Modulus, Flow Number and Flow Time. It is also the prescribed equipment in AASHTO TP 79-09 Standard Method Test for Determining the Dynamic Modulus and Flow Number for Hot Mix Asphalt (HMA) using the Asphalt Mixture Performance Tester (AMPT). In addition, the Pavetest AMPT can also perform Direct Tension Cyclic Fatigue, Indirect Tensile Dynamic Modulus, Incremental Repeated Load Permanent Deformation, Semi-circular bend, and Overlay Testing of Asphalt Mixtures.

The Pavetest AMPT is underpinned by Pavetest’s leading edge CDAS digital controller, TestLab software and a full complement of accessories, hardware and software in perfect unison.

MAIN FEATURES

- Thermoelectric (TE) Heating/Cooling
  More reliable and environmentally friendly than mechanical refrigeration & heating elements.
- The unit can be equipped with water cooled TE heating/cooling technology (optional).
- Magnetically mounted on-specimen transducer system, based on loose core LVDTs or optional epsilon extensometers.
- Gauge point fixing jig facilitates gluing gauge points and the (top and bottom) platen for proposed AMPT Direct Tension Cyclic Fatigue (S-VECD) Test.
- Dynamic Verification Device.
- Dynaflo™ HPS provides dynamic speed control of the pump motor ensuring quiet operation.
- Optional built-in, silent, air compressor with associated air preparation equipment.

The machine includes:

- 8 Channel Control and Data Acquisition System (CDAS) & TestLab software
- 30 mm Actuator LVDT
- Load cell (± 20 kN)
- Pressure transducer (± 300 kPa)
- Temperature transducer (-80 °C to + 80 °C)
- Magnetically mounted on-specimen LVDT (2 mm) (3 pieces)
- 105 mm bottom loading platen
- 105 mm top loading platen

It requires pressurized air, minimum 7 bar (not included).
### TECHNICAL SPECIFICATIONS

**Load capacity:** 19kN (Static) - 17kN (Dynamic)

**Actuator stroke:** 30 mm

**Specimen size:** 100 mm (diameter) x 150 mm (h)

**Temperature range:**
- 0 °C to 70 °C (B200)
- -10 °C to 70 °C *(B200L)*

**Confining pressure:** 0 to 225 kPa

**Noise level:** Less than 70 db at 2 m

**Power Supply:** 110/230V 50-60Hz 1ph 3.5kW (B200 | B200L)

**Dimensions:**
- 1510(h) x 680(d) x 1200(w) mm
- 1870(h) x 680(d) x 1200(w) mm with raised cell

**Weight:** 330 kg approx. (including oil)

* At an ambient temperature of +23 °C

### NEEDED ACCESSORIES

**B201 KIT** AMPT Consumables kit. Comprises:
- **B253-53** Gauge point (24 pieces)
- **B201-52** 5 Minute, two part epoxy 24 ml
- **S311-03** 100 mm Sealing Rings (Pack of 10)
- **B201-53** 100 mm Rubber membrane 0.3 mm thickness (Pack of 10)
- **B200-10** Latex membrane material cut in 100mm diameter discs (needed for AASHTO T378)
- **B200-04** 100 mm AMPT tension platens (2 needed pieces) for S-VECD test

### RECOMMENDED ACCESSORIES

**B202** Gauge Point Fixing Jig

**B202-04** Spacer for 130 mm specimen height to be used with gauge point fixing jig B202

**B203** AMPT Dynamic Verification Device

**H009-01EN** PC complete with LCD monitor 22", keyboard, mouse, cables and installation of Testlab software

### OPTIONAL ACCESSORIES

**B270-18** Membrane stretcher for asphalt specimen Ø 100 mm (optional)

**B200-09** Spacer to enable 130mm tall specimens to be tested in tension/compression (S-VECD test on small specimens)

**B200-13** AMPT silent air compressor

**B200-13X** AMPT silent air compressor 230V 60Hz
### TESTING KITS

**B204 KIT**  Overlay kit according to ASTM WK26816. Comprises:
- B204-01  Overlay jig
- B204-02  Pair of Overlay Tester (OT) specimen plates
- B204-03  OT specimen preparation jig according to ASTM WK26816

**B204-01 KIT** Overlay kit according to TEX-248-F. Comprises:
- B204-01  Overlay jig
- B204-02  Pair of overlay tester (OT) specimen plates
- B204-03  OT specimen preparation jig according to TEX-248-F

**B207-01 KIT** AMPT Indirect Tensile (IDT) kit. Comprises:
- B207-01  AMPT IDT Jig
- B253-01  LVDT mounting Jig
- B253-03  Gauge point template (150 mm specimen)
- B290-04  AMPT Miniature LVDT (1 mm) (4 pieces)
- B253-53  Gauge point (32 pieces)
- B207-02  Cable gland (4 pieces)

**B207-02 KIT** AASHTO TP124 | ASTM D8044 SCB testing kit. Comprises:
- B208  SCB frame
- B254-10  Roller support
- B254-02  Springs and roller

**B254-02 KIT** AASHTO TP124 | ASTM D8044 SCB testing kit. Comprises:
- B208  SCB frame
- B254-10  Roller support
- B254-02  Springs and roller

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### CDAS - Control and Data Acquisition System

Pavetest’s compact Control and Data Acquisition System (CDAS) delivers unparalleled performance, real time control and ultimate versatility in acquisition. The AMPT has a stand-alone CDAS, which is common to all Pavetest systems.
### SMALL SPECIMENS ACCESSORIES | AMPT

For dynamic modulus on 38 mm (diameter) x 110 mm (h) specimen:

- **B200-05** Bottom loading platen for 38 x 110 mm (Ø x h) specimen
- **B200-06** Top loading platen for 38 x 110 mm (Ø x h) specimen
- **B202** Gauge Point Fixing Jig
- **B202-02** Spacer for 110 mm specimen height to be used with gauge point fixing jig B202
- **B202-03** 38 mm and 50 mm diameter specimen - extension for gauge point fixing jig plungers B202
- **B253-53** Gauge point (32 pieces)
- **B201-52** 5 Minute, two part epoxy 24 ml
- **S311** Sealing ring Ø 38 mm (10 pcs)
- **S310** Rubber membrane Ø 38 mm (10 pcs)
- **B270-20** Membrane stretcher for asphalt specimen Ø 38 mm

For S-VECD test on 38 mm (diameter) x 110 mm (h) specimen:

- **B200-11** 38MM AMPT tension platen (2 pieces needed)
- **B202** Gauge Point Fixing Jig
- **B202-02** Spacer for 110 mm specimen height to be used with gauge point fixing jig B202
- **B202-03** 38 mm and 50 mm diameter specimen - extension for gauge point fixing jig plungers B202

For dynamic modulus on 50 mm (diameter) x 135 mm (h) specimen:

- **B200-07** Bottom loading platen for 50 x 135 mm (Ø x h) specimen
- **B200-08** Top loading platen for 50 x 135 mm (Ø x h) specimen
- **B202** Gauge Point Fixing Jig
- **B202-01** Spacer for 135 mm specimen height to be used with gauge point fixing jig B202
- **B202-03** 38 mm and 50 mm diameter specimen - extension for gauge point fixing jig plungers B202
- **B253-53** Gauge point (32 pieces)
- **B201-52** 5 Minute, two part epoxy 24 ml
- **S311-01** Sealing ring Ø 50 mm (10 pcs)
- **S310-01** Rubber membrane Ø 50 mm (10 pcs)
- **B270-21** Membrane stretcher for asphalt specimen Ø 50 mm

For S-VECD test on 50 mm (diameter) x 135 mm (h) specimen:

- **B200-12** 50MM AMPT tension platen (2 pieces needed)
- **B202** Gauge Point Fixing Jig
- **B202-01** Spacer for 135 mm specimen height to be used with gauge point fixing jig B202
- **B202-03** 38 mm and 50 mm diameter specimen - extension for gauge point fixing jig plungers B202

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![Gauge Point Fixing Jig + accessories for small specimens preparation](image-url)
B215
SERVO-PNEUMATIC OVERLAY TESTER

The Pavetest Overlay Tester is a servo-pneumatic controlled testing machine utilizing digital control of a high performance servo valve to provide accurate loading wave shapes up to 60Hz, specifically designed to determine the susceptibility of asphalt mixtures to cracking according to Texas DOT test procedure Tex-248-F and proposed ASTM Standard WK 26816.

The machine applies cyclic loading to a specimen that is cut from a 150 mm diameter sample into the shape of a rounded end beam. The system comprises a load frame, with one fixed and one moving plate, temperature control system, Control and Data Acquisition System (CDAS) and optional silent air compressor. The specimen is glued to two plates and this assembly is placed in the machine for testing. This is intended to simulate the action of movement under an asphalt overlay to assess how failure might occur in the field due to factors such as thermal expansion / contraction and reflective cracking.

The Pavetest Overlay Tester is underpinned by Pavetest’s leading edge CDAS digital controller, TestLab software and all the necessary accessories, hardware and software in perfect unison.

The machine includes:
- Load frame with one fixed and one moving plate
- 15 kN Servo-pneumatic actuator (10 mm stroke)
- 8 Channel Control and Data Acquisition System (CDAS) & TestLab software
- Load cell (± 15kN)
- 10 mm displacement transducer
- Thermoelectric Heating/Cooling system
- Temperature transducer -80 °C to + 80 °C

It requires pressurized air, minimum 7 bar (not included)

MAIN FEATURES

- Compact, fully self contained, precision engineered unit.
- Thermoelectric (TE) Heating/Cooling - More reliable and environmentally friendly than mechanical refrigeration & heating elements.
- Optional silent, air compressor including membrane dryer.
- Built in verification (Dial gauge).
- Integral stand with wheels.
TECHNICAL SPECIFICATIONS

Load Capacity: Up to 16 kN (Static)
Actuator stroke: 10 mm
Temperature range: 10 to 60 °C
Noise Level: Less than 70 db at 2 m
Power supply: 110/230V 50-60Hz 1ph 750W (B215)
Dimensions: 980 (h) x 475 (d) x 1085 (w) mm
Weight: 150 kg approx.

TECHNICAL FEATURES

- Temperature controller. The overlay tester is fitted with a temperature controller, which controls the heating/cooling provided by the thermo-electric unit fitted to the machine.
- The specimen preparation jig allows users to properly locate and glue the specimen on plates. It can accommodate up to three sets of platens. It includes 2 mm teflon strip, which helps aligning the specimen plates and eliminate the need to saw the glue afterwards, and a dead weight.
- The Overlay Tester main unit comes fully assembled. It can be placed on the folding stand supplied, complete with wheels.

NEEDED ACCESSORIES

- B204-02 Pair of specimen plates
- B204-03 OT specimen preparation jig according to ASTM WK 26816
- B204-13 OT specimen preparation jig according to Tex-248-F

Note: The quantity depends on the customer’s need.

OPTIONAL ACCESSORIES

- B204-11 Silent air compression 750W
- B204-11X Silent air compression 750W 230V 60Hz
TSRST-MULTI
MULTI STATION THERMAL ASPHALT SYSTEM

STANDARDS:
AASHTO TP10-1993 Standard test method for Thermal Stress Restrained Specimen Tensile strength
EN 12697-46:2012 Test methods for hot mix asphalt Part 46: Low temperature cracking and properties by uniaxial tension tests

MAIN FEATURES

- Up to three working stations (electromechanical and/or servo-hydraulic stations).
- Servo-hydraulic actuator: 30 kN static, 25 kN dynamic, double acting, fatigue rated and equal area type with long life Labyrinth bearings & seals.
- Dynaflo™ Hydraulic Power Supply: Variable Frequency Drive 2.2 kW pump motor; Silent operation.
- Ability to clone, modify and/or generate user’s own method file(s) to suit their specific requirements.
- Programmable test Wizard to guide the operator step by step based on a recipe book approach.
- Temperature controller programmed via PC software.

FIRST STAND ALONE SERVO-HYDRAULIC TSRST
PAVEMENT TECHNOLOGY

The Thermal Stress Restrained Specimen Test (TSRST) is used to determine the low temperature cracking susceptibility of asphalt concrete. In the early 1990s the TSRST was developed by Oregon State University (OSU) as part of the Strategic Highway Research Program. The test method became AASHTO TP10.

PAVETEST TSRST-MULTI: THE NEXT GENERATION OF MULTI-STATION THERMAL ASPHALT SYSTEM

FIRST STAND-ALONE SERVO-HYDRAULIC TSRST ON THE MARKET
With up to three servo-hydraulic testing station in one unit, Pavetest TSRST-Multi is the first stand-alone servo-hydraulic low temperature cracking asphalt testing system on the market able to test up to three different specimens simultaneously, under the same temperature conditions.

FLEXIBLE
Designed with flexibility in mind, Pavetest TSRST-multi can use different combinations of servo-hydraulic and/or electro-mechanical testing stations with no need for a compressed air supply.

VERSATILE
Pavetest versatile TSRST-Multi can be used to evaluate:
- Uniaxial tension stress test (UTST)
- Thermal stress restrained specimen test (TSRST)
- Relaxation time, using the relaxation test (RT)
- Tensile creep tests (TCT)
- Uniaxial cyclic tension stress test (UCTST)
- Uniaxial thermal stress & strain test (UTSST)
  It requires additional hardware

POWERFUL
Equipped with Pavetest’s leading edge Control and Data Acquisition System (CDAS) and TestLab software, the user can control up to 3 testing stations in one unit, with unparalleled performance and ultimate versatility.
EASY TO OPERATE
Pavetest TestLab software makes it easy to operate the system because it enables the operator to program the temperature controller with ease.

SAFE
Pavetest TSRST-Multi employs a reliable refrigeration system, capable of cooling at a rate of 10° per hour. Mechanical refrigeration eliminates the need for liquid nitrogen, offering a completely safe working environment for the operator.

QUIET
The Electro-mechanical and/or dynamically controlled hydraulic power supply are almost silent during testing.

DYNAFLO™
The servo-hydraulic station(s) are powered by the Dynaflo Hydraulic Power Supply (HPS). The Dynaflo HPS is an innovative concept based on “inverter” technology: An inverter is used to control the speed of the pump motor to control hydraulic oil flow based on the requirements; reducing noise and heat generation, rendering the HPS silent in most applications. It also improves the longevity of the pump because it only works as hard as it needs making it quiet, cool and long lasting.
The **environmental chamber** is constructed from **top quality stainless steel**; stylish, durable and easy to clean.

**Mechanical refrigeration** capable of cooling at -10 °C per hour down to -40 °C; no need for liquid nitrogen.

The **modular concept** allows the system to be configured in any combination of, **up to three electro-mechanical and/or servo-hydraulic stations**, without the need for compressed air supply.

The **high performance digital temperature controller** can be programmed through the software; eliminating the arduous task of setting the controller using the tiny buttons on the controller.

**Triple glazed, low-e glass door** offers excellent insulation without compromising visibility.

**Internal lighting** ensures good visibility under all conditions.

Uniquely **low coefficient** of **thermal expansion invar rods** offer accurate measurement and control over the full temperature spectrum.

**Axial alignment** is achieved using self-aligning couplings.

**Small footprint** makes best use of precious laboratory space.

**Fully integrated digital control and data acquisition system** (CDAS).

**Only** requires **electrical power** for easy installation.
CONTROL AND DATA ACQUISITION SYSTEM (CDAS)

CONTROL:
- High speed, (18 bit) digital servo-control, 4/6 axis.
- Digital closed loop update sampling rate of 2.5 kHz.
- Computer programmable, Proportional, Integral and Derivative (PID) control algorithm.
- Adaptive Level Control (ALC) algorithm for best dynamic peak accuracy.
- 3 feedback control modes. E.g. force, position and on-specimen strain.
- “Bumpless transfer” between control modes.

ACQUISITION:
- Analog inputs are automatically calibrated on power up.
- Simultaneous sampling of all channels.
- 16 Analog (±10 Volt) input channels.
- Up to 64 times over sampling (set to 8 by default).
- 20 bit digital resolution (no auto ranging required).
- Sampling rate up to 192,000 samples/see.

COMMUNICATION:
- USB or Ethernet

ENVIRONMENTAL CHAMBER
- REFRIGERATION RANGE: -40 °C to + 40 °C, capable of cooling at a rate of 10 °C per hour.
- Optional: -50 °C to + 40 °C version (for AASHTO TP 10 test).

Real Time Dashboard display shows transducer levels, computed data and charted data before, during and after the test has completed.
Dynamic image update feature shows visual image representation of specimen failure Multi-axes representation for clear visual presentation of test status for each axes.
Very user friendly presentation simplifies specimen setup in the machine.

The dashboard display feature of Testlab provides the user with an intuitive visual representation of the current status of both the machine and test method. The dashboard shows live transducer level measurements along with nominated key test data information and real time chart updates. This feature is individually customisable for each method file. Pavetest has already available dashboard designs for the more sophisticated tests including multi station TSRST.
**Loading frame(s)**
- Rigid two column frame
- Width of work space: 240 mm
- Height of work space (between the two platens): 285 mm

**Electro-mechanical actuator(s)**
- 25kN static with ± 50 mm stroke (100 mm)
- Internal displacement transducer

**Servo-hydraulic actuator**
- 30kN static, 25kN dynamic, double acting, fatigue rated, servo-hydraulic actuator, equal area type with long life seals & bearings
- ± 50 mm stroke (100 mm)
- Internal displacement transducer
- Close coupling of servo valve to actuator for best servo performance
- 10 μm pressure line filter at actuator for ultimate contamination control
- 0.5 lt hydraulic accumulator with 40 Bar pre-charge for best pressure line regulation at servo-valve.
- High response, VCD direct drive, servo-valve: -3 db @ 350 Hz, ± 5% amplitude (performance curves available on request)

**Load cell(s)**
- Low profile Precision Transducers load cell, ± 30kN, 0.1%. Normalized output with in-line signal conditioning

**Hydraulic power supply**
- Working pressure of up to 160 Bar (low pressure adjustable)
- High/Low pressure selectable from control pendant
- Variable flow rate up to 7.5 liter/min
- Variable Frequency Drive (VFD) 2.2kW pump motor; speed based on demand
- 3 μm return line filtration
- Low oil, over temperature and dirty filter displayed
- Remote starting
- Pressure gauge
- Air cooling (Electric fan)

---

**ORDERING INFORMATION**

The basic MULTI TSRST includes the main frame, the CDAS, the climatic chamber, the refrigeration unit and at least one between the electro-mechanical or servo-hydraulic station. All available configurations are summarized in the following table:

<table>
<thead>
<tr>
<th>ELECTROMECHANICAL STATION</th>
<th>SERVO-HYDRAULIC STATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>B282-10</td>
<td>1</td>
</tr>
<tr>
<td>B282-11</td>
<td>2</td>
</tr>
<tr>
<td>B282-12</td>
<td>3</td>
</tr>
<tr>
<td>B282-13</td>
<td>1</td>
</tr>
<tr>
<td>B282-14</td>
<td>1</td>
</tr>
<tr>
<td>B282-15</td>
<td>2</td>
</tr>
</tbody>
</table>

**Note:**
Multiple stations configuration (B282-11, B282-12, B282-14, B282-15) allow to run tsrst tests with all stations simultaneously. In this configurations, utst, rt, tct, utsst and utcst tests are performed on one station at a time. With combined configuration (electromechanical and servo-hydraulic) utcst must be performed with servo-hydraulic station.

**TO PERFORM**
- Uniaxial tension stress test (UTST)
- Thermal stress restrained specimen test (TSRST)
- Relaxation time, using the relaxation test (RT)
- Tensile creep tests (TCT)
- Uniaxial cyclic tension stress tests (UCTST)**
- Uniaxial thermal stress & strain test (UTSSST)***

**ACCESSORIES**

| B282-08 | TSRST specimen gluing jig (needed) |
| B282-18 | TSRST proof test assembly (optional) |

Disk Shaped Compact Tension test:
- **B284-01** Disk-shaped compact tension test jig
- **B282-02** Rod ends (2 pieces needed)
- **B290-07** SCB deformation gauge (needed)
- or** B290-12** Epsilon (model 3541) clip-on gauge cmod transducer +1/-7 mm (Alternative to B290-07)
- **C090-18** Knife edge (pack of 24) only for B290-12

Simple and easy to use gluing jig for preparing TSRST specimens. The jig provides for perfect alignment and adjustment for different sized specimens. The clamping force is easily set and ensures the end plates are glued perpendicular to the specimen.
B225
STS-25 STATIC TESTING SYSTEM
THE MOST VERSATILE TESTING MACHINE IN THE MARKET
STANDARDS: ASTM D7313-07a | AASHTO TP105-13 | AASHTO TP124 | ASTM D8044 | ASTM WK 26816 | AASHTO T 314-12
AASHTO TP10-1993 | TxDOT Tex-248-F

The Pavetest 25kN Static Testing System (STS-25) is an electro-mechanical servo-controlled testing machine utilizing digital control of a high performance electro-mechanical actuator to provide accurate loading rates up to 50mm/minute, designed to perform a range of static tests; including: Overlay, SCB, DCT, TSRST and DTT. The STS-25 is underpinned by Pavetest’s leading edge CDAS digital controller, TestLab software and a full complement of accessories hardware and software in perfect unison.

MAIN FEATURES

- Compact, fully self-contained, precision engineered unit.
- Precision electro-mechanical actuator (silent operation).
- Suitable for a range of testing protocols.
- A range of two piece climatic chambers.
- Operator can monitor, set and “Auto tune” the temperature controller via the PC.
- Optional swivel stand allows the unit to be oriented vertically or horizontally.

The machine includes:

- Rigid two column load frame
- 25 kN electro-mechanical actuator (30 mm stroke)
- 8 channel Control and Data Acquisition System (CDAS) & TestLab software
- Load cell (+/− 30 kN)
- 30 mm actuator LVDT

B225 STS-25 Static Testing System
Horizontal configuration complete with swivel stand B225-04

### TECHNICAL FEATURES

- **Electro-mechanical unit.** The machine applies constant rate of loading to a specimen that is placed in the load frame.
- **The system comprises** a load frame, with a load cell, integral displacement transducer, insulate cabinet, Control and Data Acquisition System (CDAS). The insulated chamber with small glass door reduces heat loss whilst providing uninterrupted view of the specimen.
- **Versatile.** An optional swivel stand allows the unit to be oriented vertically or horizontally; to suit the application.
- **Portable temperature control unit.** We offer three models of temperature control unit, with different temperature ranges, to cover a number of international testing standards.

### NEEDED ACCESSORIES

- **B225-01** Temperature controlled cabinet - TE UNIT.  
  +10 °C to +60 °C TO SUIT STS-25

- **B225-02H** Temperature controlled cabinet - REFR. UNIT.  
  Horizontal configuration: -20 °C to +80 °C to suit STS-25

- **B225-03H** Temperature controlled cabinet - REFR. UNIT.  
  Horizontal configuration: -40 °C to +80 °C to suit STS-25

- **B225-02V** Temperature controlled cabinet - REFR. UNIT.  
  Vertical configuration: -20 °C to +80 °C to suit STS-25

- **B225-03V** Temperature controlled cabinet - REFR. UNIT.  
  Vertical configuration: -40 °C to +80 °C to suit STS-25

### OPTIONAL ACCESSORIES

- **H009-01EN** PC 22" with lcd screen
- **B250-07-KIT** Temperature measuring KIT
- **B225-04** swivel stand (only for B225-01)

For test configuration and related jigs, please consult p. 182-192

### TECHNICAL SPECIFICATIONS

- **Load Capacity:** Up to 25kN
- **Actuator stroke:** 30 mm
- **Testing space:** 400 mm
- **Loading rate:** 0.3mm/min. to 50mm/min.
- **Temperature range:**  
  - 10 to 60 °C (thermoelectric unit)  
  - -20 to 80 °C or -40 to 80 °C (refrigeration unit)
- **Mains Power:**  
  - 230V 50-60Hz 1ph (B225)  
  - 230V 50-60Hz 1ph (thermoelectric unit)  
  - 230V 50Hz 1ph (refrigeration unit)
B215EM
ELECTRO-MECHANICAL OVERLAY TESTER

STANDARDS: ASTM WK 26816 Standard Test Method for Determining the Susceptibility of Asphalt Mixtures to Cracking Using the Overlay Tester
TxDOT Tex-2 48-F – Test Procedure for Overlay Test

The Pavetest Overlay Tester is an electro-mechanical servo-controlled testing machine utilizing digital control of a high performance electro-mechanical actuator to provide accurate loading rates up to 50 mm/minute, designed to determine the susceptibility of Asphalt Mixtures to cracking. Applies tension in a cyclic triangular waveform to a constant maximum displacement of 0.6 mm (0.026). The sliding block reaches the maximum displacement and then returns to its initial position in 10 sec. (one cycle). The unit is underpinned by Pavetest’s leading edge CDAS digital controller, TestLab software and a full complement of accessories hardware and software in perfect unison.

NEEDED ACCESSORIES

B225-01 Temperature controlled cabinet - te unit: +10 °C to +60 °C
or
B225-02H Temperature controlled cabinet - refr. unit. Horizontal configuration: -20 °C to +80 °C
B204-14 Overlay jig
B290-02 OT LVTD (10 MM) to be used with Electro-mechanical Overlay Tester
B204-02 Pair of Overlay Tester (OT) specimen plates
B204-03 OT Specimen preparation jig according to ASTM 26816
or
B204-13 OT Specimen preparation jig according to TxDOT_tex-248-F

OPTIONAL ACCESSORY

H009-01EN PC 22” with lcd screen
B225-09

DTT DIRECT TENSION TESTER

STANDARDS: AASHTO T 314-12 Determining the Fracture Properties of Asphalt Binder in Direct Tension

The Pavetest DTT Direct Tension Tester is an electro-mechanical servo-controlled testing machine utilizing digital control of a high performance electro-mechanical actuator to provide accurate loading rates up to 50 mm/minute, designed to determine the fracture properties of Asphalt binder in Direct Tension (DTT). The unit is underpinned by Pavetest’s leading edge CDAS digital controller, TestLab software and a full complement of accessories hardware and software in perfect unison.

NEEDED ACCESSORIES

B225-03H Temperature controlled cabinet - refr. unit.
   Horizontal configuration: -40 °C to +80 °C

B225-10 Direct Tension jig complete with 25 mm on specimen displacement transducer.

OPTIONAL ACCESSORY

H009-01EN PC 22” with lcd screen
<table>
<thead>
<tr>
<th>Sigla</th>
<th>Testing Kit/Jig/Accessories</th>
<th>Relevant standard(s)</th>
<th>With temperature controlled cabinet</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC(T)</td>
<td>B284-01</td>
<td>ASTM D7313-07a</td>
<td><em>(10°C greater than the low temperature PG of the asphalt binder)</em> (B225-02H or B225-02V or B225-03H or B225-03V)</td>
<td>B290-07 needed or B290-12 + C090-18 needed</td>
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<tr>
<td>SCB</td>
<td>B254-02-KIT</td>
<td>AASHTO TP124</td>
<td><em>(25°C)</em> (B225-01 + optional B225-04 or B225-02V or B225-03V)</td>
<td>B254-16 needed B290-02 (1 or 2) optional B254-11 (according to B290-02 q.ty) optional B254-12 optional</td>
</tr>
<tr>
<td></td>
<td>(B208+B254-10+B254-02)</td>
<td>ASTM D8044</td>
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</tr>
<tr>
<td>SCB</td>
<td>B254-02-KIT</td>
<td>AASHTO TP105-13</td>
<td><em>(22°C greater than the low temperature PG of the asphalt binder)</em> (B225-02V or B225-03V)</td>
<td>B254-16 needed 2 x B253-53 needed B254-13 needed 2 x B254-14 needed 2 x B254-15 needed 2 x B290-05 or 2 x B290-06 needed B290-07 or B290-16 + C090-18 needed</td>
</tr>
<tr>
<td></td>
<td>(B208+B254-10+B254-02)</td>
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<tr>
<td>OT</td>
<td>B204-14</td>
<td>ASTM WK26816</td>
<td><em>(25°C)</em> (B225-01 + optional B225-04 or B225-02V or B225-03V)</td>
<td>3 x B204-02 needed B204-03 needed B290-020T needed</td>
</tr>
<tr>
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<tr>
<td>OT</td>
<td>B204-14</td>
<td>Tex 248F</td>
<td><em>(25°C)</em> (B225-01 + optional B225-04 or B225-02V or B225-03V)</td>
<td>3 x B204-02 needed B204-13 needed B290-020T needed</td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>DTT</td>
<td>B225-10</td>
<td>AASHTO T314-12</td>
<td><em>(+6°C to -40°C)</em> (B225-03H)</td>
<td>none</td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>TSRST</td>
<td>B282-01-KIT</td>
<td>AASHTO TP10</td>
<td><em>(+50°C to +10°C, capable of cooling at a rate of 10°C per hour)</em> (B225-03V)</td>
<td>2 x B290-09 needed B282-08 needed B201-52 optional</td>
</tr>
<tr>
<td></td>
<td>(3 x B282-01+2 x B282-02+1 x B282-21+1 x B282-09+2 x B282-04+2 x B282-05+2 x B282-06+B282-07)</td>
<td></td>
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</tbody>
</table>
**B040-20**

**AUTOMATED CORE DRILL**

Matest has developed an Automated Core Drill (ACD) for fast, accurate cutting of cores from cylinders, prisms and slabs prepared using Matest’s range of asphalt compaction machines; GYROTHERMIC-Gyratory Compactor, ASC-Asphalt Shear-box Compactor and field specimens for subsequent testing using Matest/Pavetest’s range of leading edge testing systems.

**MAIN FEATURES**

- Three selectable drill speeds.
- Clear protective/splash screen conforming to CE standards.
- Ideal for coring prismatic specimens compacted in Asphalt Shear-box Compactor (ASC).
- Suitable to core cylindrical specimens compacted in Gyratory compactor(s).
- Includes water container/tray.
- Adjustable specimen clamp eliminates specimen movement during coring.
- Three position fixture provides easy and accurate specimen positioning.
- Three core supports at fixed spacing yields two or three cores from one prism.
- Optional cylindrical specimen jig.

**SPECIFICATIONS**

- Drill Bit: Diamond/tungsten alloy, laser welded.
- Core diameter: 100 mm or 150 mm. For other core diameters, see the accessories.
- Core height up to 40 cm.
- Specimen sizes:
  - Cylindrical Sample: 160 mm x 70 mm - 400 mm (ØxH)
  - Prismatic Sample:
    - 200-450 mm x 150-185 mm x 120-420 mm (LxDxH)
    - 315-340 mm x 220-260 mm x 120-420 mm (LxDxH)
- Dimensions: 60 cm (L) x 80 cm (D) x 140 cm (H)
- Net weight: 85 kg
- Power supply: 230V 10A 50Hz 1ph (540/1, 300/1, 800 rpm)
  - 230V 10A 60Hz 1ph (560/1, 330/1, 850 rpm)
  - 115V 20A 60Hz 1ph (560/1, 330/1, 850 rpm)

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B040-20</td>
<td>Asphalt Core Drill (230V/50-60Hz) for prisms</td>
</tr>
<tr>
<td>B040-20Y</td>
<td>Asphalt Core Drill (110V/60Hz) for prisms</td>
</tr>
</tbody>
</table>

**ACCESSORIES**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C339-03</td>
<td>Ø 100 x 420 mm long drill bit (needed)</td>
</tr>
<tr>
<td>C339-04</td>
<td>Ø 150 x 420 mm long drill bit (needed)</td>
</tr>
<tr>
<td>B040-21</td>
<td>Clamping cylindrical specimen jig to suit from 50 to 150 mm diameter specimens (needed)</td>
</tr>
</tbody>
</table>

**B040-22 KIT** DCT specimen. It includes:

- B040-22 DCT specimens drilling jig
- B040-33 Ø 25 x 420 mm long drill bit

**B040-23 KIT** Transversal coring. It includes:

- B040-23 Transversal coring jig
- C339-02 Ø 75 x 420 mm long drill bit
- B040-30 Ø 38 x 420 mm long drill bit
- C339-01 Ø 50 x 420 mm long drill bit

- B040-31 Ø 42 x 420 mm long drill bit
- B040-32 Ø 55 x 420 mm long drill bit
- C346 Core Extractor Ø 50 mm
- C346-01 Core Extractor Ø 75 mm
- C346-02 Core Extractor Ø 100 mm
- C346-03 Core Extractor Ø 150 mm
B040
APS
AUTOMATIC PAVE SAW
DUAL BLADE CONCEPT FOR PERFECT PARALLEL CUTTING

Matest has developed a dual bladed automated sawing system for fast, accurate cutting of cores, prisms and slabs prepared using Matest’s range of asphalt compaction machines; GYROTRONIC-Gyratory Compactor, ASC-Asphalt Shear-box Compactor and ARC-Asphalt Roller Compactor for Four Point Bending (4PB), Two Point Bending (2PB), Overlay tester (OT), Semi Circular Bending (SCB) and wheel tracking tests using Matest/Pavetest’s range of leading edge testing systems.

It includes: cooling water recirculation pump, tank and protection cabinet with interlocks to ensure operator safety.

MAIN FEATURES

- Two saw blade design ensures for perfect parallel cutting.
- Motorized feed with automatic retraction of saw carriage.
- Electronic control unit with touch screen colour display, that runs like a standard PC based on Windows operating system.
- Adjustable cutting speed.
- Slabs and prisms can be sawn safely and accurately.
- Jigs also available for trimming 100 and/or 150mm diameter cylinders/cores.
- Facilitates cutting rectangular beams, trapezoidal prisms, overlay test specimens, semi-circular & wheel tracking specimens, and cylindrical specimens.
- Simple spacer system allows precise preparation of beams and cylinders from 38mm to 160mm long, without the need for measurement.
- Other dimensions can be accommodated using integral ruler.
- Adjustable limit switches facilitates repetitive cutting with minimal saw carriage travel. Secure specimen clamping. Choice of mechanical or pneumatic.
- Protective enclosure, with safety interlocks, combines clean operation with unparalleled operator safety.
- Dynamic breaking system stops saw blade rotation when power is switched off.
THE NEXT GENERATION FULLY AUTOMATED ASPHALT SAWING SYSTEM

Matest’s new APS-Automatic Pave Saw is the next generation fully automated asphalt sawing system with integrated specimen clamping. The APS offers fast and accurate cutting of rectangular beams, trapezoidal prisms, overlay test specimens, semi-circular specimens, and trimming of cylindrical specimens.

The APS uses two blades to ensure perfect parallel cutting of cylinders and beams at set intervals from 38 to 160 mm long. If equipped with proper blades, the APS cuts not only asphalt but also several other materials.

The APS is controlled using Matest’s tried and proven iTouch electronic control unit with touch screen colour display for perfect cutting of specimens for AASHTO, ASTM and EN standards without the need for manual measurements. It is the safest and most advanced asphalt cutting saw available on the market and is the perfect companion to our range of advanced asphalt preparation and testing equipment.

The APS is capable of cutting prismatic specimens up to 240mm high and a cutting length up to 700mm and cylindrical specimens up to 200mm diameter. The APS can be configured using one or two blades, with a large range of jigs and fixtures to cut rectangular beams, trapezoidal prisms, overlay test specimens, semi-circular & wheel tracking specimens, and trim cylindrical specimens accurately, with excellent parallelism and perpendicularity. Various alignment blocks, guides and reference spacers allow operators to easily achieve the most commonly used dimensions specified in a range of international standards with little or no measurement. Any other dimensions can be accommodated with the aid of an integrated ruler.

The iTouch controller allows the operator to easily control the cutting speed and sequence and a series of adjustable limit switches minimise the saw carriage travel during repetitive cutting. The high grade stainless steel work surface and associated corrosion resistant components ensures the unit will perform well and look good for many years.

The protective enclosure provides a high level of operator safety and protection from water spray. Safety interlocks prevent the operator from opening the enclosure and accessing hazardous areas while the blade is rotating. Once the cutting sequence has finished and the blade has stopped rotating, the enclosure is unlocked automatically.

ACCESSORIES

- **B040-01** APS DIAMOND BLADE, 650 mm diameter (q.ty 1 or 2)
- **B040-02** APS DIAMOND BLADE, 700 mm diameter (q.ty 1 or 2)
- **B040-03** SET OF SPACERS for mounting the APS Diamond blade, 650 mm diameter (needed for B040-01)
- **B040-04** SET OF SPACERS for two blades configuration (needed for two blades configuration)
- **B040-05** SPACER for one blade configuration (needed for one blade configuration)
- **B040-06** DISPLACEMENT TRANSDUCER for the control of the blade position
- **B040-07** PNEUMATIC CIRCUIT (needed with Pneumatic cutting jigs)

If equipped with pneumatic cutting jigs, the unit requires compressed air, minimum 8 bar

SPECIFICATIONS

- One or two blade concept
- Blade Diameter(s): 650 mm or 700 mm
- Blade Speed: 1,400rpm (50Hz) or 1,680rpm (60Hz)
- Adjustable cutting speed, min 40 mm/min max 200 mm/min
- Max Cutting Depth: 200 mm (with 650 mm blade diameter) or 240 mm (with 700 mm blade diameter)
- Cores 100 or 150 mm diameter (38 mm or 200 mm diameter on request)
- Max Prism Length 700 mm
- Cooling water recirculation pump and tank included
- Net Weight: 500 kg approx.
- Parallel (Dual blade) cutting distance: 38 mm to 160 mm at set distances
- Dimensions: 2370 mm (L) x 1340 mm (D) x 1670 mm (H)
- Air Supply: 600 kPa (for pneumatic clamping option)
- Power Supply:
  - 400V 50Hz 3ph, 230V/220V 50Hz 3ph (B040)
  - 400V 60Hz 3ph, 230V/220V 60Hz 3ph (B040X)
  - 208V 60Hz 3ph (B040Z)

CUTTING JIGS

- **B040-10M** APS manual Multi-Slab/Prism jig suitable for slabs and prisms with the following dimensions: 40 - 240 mm depth x 700 mm length
- **B040-10P KIT** APS automatic Multi-Slab/Prism jig suitable for slabs and prisms with the following dimensions: 40 - 240 mm depth x 700 mm length
- **B040-12M** APS manual trapezoidal specimen jig for two point bend (it requires B040-10M or B040-10P-KIT)
- **B040-13M** APS manual core docking jig for Ø 150-100-60-50-40-38 mm cores
- **B040-13P** APS automatic core docking jig for Ø 150-100-60-50-40-38 mm cores
- **B040-14** Instrumentation for Overlay test, wheel tracking core, semi-circular and disk shaped compact tension specimens (it requires B040-13M or B040-13P)
B039A
ASC
ASPHALT SHEAR BOX COMPACTOR
THE ONLY ELECTROMECHANICAL SHEAR BOX COMPACTOR

NEW STANDARD: ASTM D7981-15 Standard practice for compaction of prismatic asphalt specimens by means of the Shear Box Compactor.

The ASC is being used in FHWA Contract “Deployment of Performance-Based Technologies for Mechanistic-Empirical Pavement Design and Resource Responsible Materials Design” to fabricate specimens for Level 1 analyses using the AASHTOWare Pavement ME Design software.

It is the only compactor capable of fabricating specimens for all of the following mechanistic-empirical performance tests:
- **Dynamic Modulus**, AASHTO PP 61
- **Repeated Load Permanent Deformation**, AASHTO TP 79
- **Flexural Fatigue**, AASHTO T321
- **Low Temperature Creep and Strength**, AASHTO T322

**MAIN FEATURES**
- Extremely sturdy fabricated frame combined with precision machined components.
- Servo hydraulic vertical ram with integral hydraulic power supply.
- Precision electro-mechanical shearing motion (user programmable).
- Integral specimen extruder.
- Electronic control unit with touch screen color display (no need for PC).
- Unlimited memory storage with: 2 USB ports, 1 SD card slot, RS232/485 serial port.
- The compaction cycle can be programmed by specifying vertical stress/load and test termination conditions; Number of cycles, Specimen height and/or density.
- Precision load cell(s) for vertical and shear stress measurement.
- Optional built-in mould heater.

**THE MOST UNIFORM DENSITY OF ANY MACHINE**
Specimen is extruded after the machine has completed the specified number of cycles, or when the required specimen height has been reached. An automatic extruder allows an easy extraction of the compacted specimen.
## TECHNICAL SPECIFICATION

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical force</td>
<td>Up to 100kN</td>
</tr>
<tr>
<td>Shearing force</td>
<td>Up to 50kN</td>
</tr>
<tr>
<td>Shear angle</td>
<td>$4^\circ \pm 0.1^\circ$</td>
</tr>
<tr>
<td>Shearing cycle rate</td>
<td>$3 \pm 0.1$ gyrations per minute</td>
</tr>
<tr>
<td>Mould width</td>
<td>150mm $\pm 0.1$ mm</td>
</tr>
<tr>
<td>Mould length</td>
<td>450mm $\pm 0.1$ mm</td>
</tr>
<tr>
<td>Mould surface finish (inside)</td>
<td>Smoother than 0.4µm rms</td>
</tr>
<tr>
<td>Mould surface hardness</td>
<td>More than 48 Rockwell C</td>
</tr>
<tr>
<td>Mould capacity</td>
<td>Approx. 20 litres</td>
</tr>
<tr>
<td>Loading platen width</td>
<td>149 mm $\pm 0.2$ mm</td>
</tr>
<tr>
<td>Loading platen length</td>
<td>449 mm $\pm 0.2$ mm</td>
</tr>
<tr>
<td>Loading platen smoothness</td>
<td>Smoother than 0.4µm rms</td>
</tr>
<tr>
<td>Loading platen surface hardness</td>
<td>More than 48 Rockwell C</td>
</tr>
<tr>
<td>Number of cycles</td>
<td>Up to 100</td>
</tr>
<tr>
<td>Vertical stress</td>
<td>0.1 to 1.5MPa $\pm 0.01$MPa</td>
</tr>
<tr>
<td>Compaction height</td>
<td>0 mm to 200 mm $\pm 0.1$ mm</td>
</tr>
</tbody>
</table>

**Power supply:** 230V 1ph 50-60Hz  
**Dimensions:** 768x1360x1314 mm  
**Weight:** 1200 kg approx.

## ACCESSORIES

- B039A-01 LOADING CHUTE
- B039A-02 TRAY (2 off)
- B039A-03 SPREADING COMB
- B039A-04 LEVELING BLADE
- B039A-05 BUILT-IN MOULD HEATER (optional)

A RUGGED DESIGN FOR THE BEST SPECIMEN PREPARATION

Asphalt technologists are acutely aware of the importance of a representative specimen during any laboratory performance testing. The precise shearing motion of the ASC replicates the conditions of field compaction in order to reproduce the field properties of asphalt, quickly and easily under the controlled conditions of a laboratory. The ASC compacts large asphalt prisms that can be sawn to produce four to six beams or slabs for laboratory wheel tracking; or the prism can be cored to produce three to four 100 mm diameter cylinders, all having essentially identical properties.

The electronic control unit, with touch screen color display, makes a PC an option, not a necessity. The user friendly touch-screen icon interface allows for easy set up parameter entry, enables immediate (fully automatic test execution) data acquisition/processing, test report, and data file generation. A LAN connection to Intranet/Internet enables remote communication to receive immediate diagnostic analysis and technical support from Matest technicians, and/or software updates.

**Test parameters during compaction**

**Height-Cycles and Density-Cycles curves during compaction**

During the compaction process a lateral displacement is applied to the specimen along with a vertical load, which results in a shearing action that makes the compaction similar to the the field.
The Cyclic TriaxLab automated system is subdivided into 3 major groups similarly to the TriaxLab Automated System:

- **Fully digital controlled load frame** and fit for purpose Triaxial cell with accessories
- **Control system** based on the CDAS
- **Data Acquisition System** comprising:
  - 1 submersible load cell for axial force
  - 3 pressure transducers for cell pressure, back pressure and pore pressure
  - 2 Pressurematic for pressure/volume change

To suit the specific customer’s requirements the Cyclic TriaxLab Automated System basic configuration can be modified by adding or removing the hardware elements which are controlled and monitored under a closed-loop integrated system with the CDAS and TestLab Software. Pre-programmed “Method files” offer the operator the unique opportunity to run a range of tests without the need for specific computer programming. The possibility to customize the Method files is also given to the operator granting ultimate flexibility and versatility.
**CYCLIC TriaxLab Automated System**

**ORDERING INFO:**

**HARDWARE - SOFTWARE**

**B220-04 KIT**  
**DTS9 WITH MANUAL CROSSHEAD**

The machine includes:

- **B220-14**  
  20 kN load frame with manual crosshead

- **9 kN servo-pneumatic actuator with its LVDT, 50mm stroke, 70 Hz frequency.**

- **Power supply:** 90-264V 50-60Hz 1ph 240W

- **Dimensions:** 1262(h)x400(d)x470(w)

- **Weight:** 80 kg load frame

- **S303**  
  16 Channel Control and Data Acquisition System (CDAS) and TestLab software. For technical specifications, see p. 564

- **B270-12**  
  Air reservoir assembly with membrane dryer. It requires pressurized air, minimum 7 bar (not included).

- **S307**  
  **TRIAXIAL CELL MAX Ø 150X300 MM**

  Technical specifications:
  - Max specimen mm Ø 150x300
  - Max cell pressure 2200 kPa
  - Overall dimensions mm Ø 338x648
  - Weight 40 kg approx.

  Accessories listed at p. 548

  **Note:** Triaxial cell for cyclic tests max. 100x200 mm available on request.

**MEASURE OF AXIAL FORCE**

**S337-06**  
**SUBMERSIBLE LOAD CELL 10 KN WITH SIGNAL CONDITIONER**

- Rated output 2 mV/V nominal
- Accuracy 0.1%

**ACCESSORIES FOR TRIAXIAL CELL**

**S337-23**  
Loading ram for the submersible load cell

**S307-05**  
Transducers holder ring

**S307-10**  
Vacuum generator

**S307-19**  
Vacuum adaptor

**S307-11**  
Alignment coupler assembly

**S307-12**  
Spherical exclusion

**S307-13**  
Base pedestal spacer

**OPTIONAL ACCESSORIES**

**S337-08**  
Picoscope

**S307-07**  
**T-4001 waveforms transformer**

**S307-01**  
Universal puck for bender elements top

**S307-02**  
Universal puck for bender elements bottom

**S307-22 | 32 | 42 | 52**  
Base pedestal for bender element Ø 38 | 50 | 70 | 100 mm

**S307-23 | 33 | 43 | 53**  
Top platen for bender element Ø 38 | 50 | 70 | 100 mm

**S307-24 | 34 | 44 | 54**  
Pair of porous disc Ø 38 | 50 | 70 | 100 mm

**DEAIRED WATER SYSTEM**

**S355**  
**DE-ARING TANK 20 LITRES CAPACITY**

It produces de-aired water when connected to the vacuum pump. It is a Perspex tank with an inlet water valve and an outlet air valve. Tank capacity: 20 litres.

- **Dimensions:** 320x320x520 mm
- **Weight:** 15 kg approx.

**ACCESSORIES**

**V205**  
**VACUUM PUMP**

To produce vacuum up to 0.1 mbar (see p. 597)

**V205-10 - V205-12**  
**VACUUM REGULATOR**

It is supplied with vacuum gauge, control valve, suction filter and moisture trap.

**V230-03**  
**Rubber tube. Suitable for vacuum, 3 m**

**MEASURE OF PORE PRESSURE SYSTEM AND VOLUME CHANGE**

**S349**  
**PRESSUREMATIC PVC FOR AUTOMATIC PRESSURE AND VOLUME CONTROL**

Output pressure: 3500 kPa

Volume capacity: 250 cc

For Technical Specifications, see p. 565

**NEEDED ACCESSORIES**

**S336-53**  
Pressure transducer 2000 kPa with signal conditioner.

**S336-55**  
De-airing block for pressure transducer

**S349-10**  
Solenoid valve

**OPTIONAL ACCESSORIES**

**S342-03**  
**3 ways water distribution panel**