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ADVANCED
PAVEMENTS
TESTING

AutoBBR

Automatic electromechanical Bending Beam Rheometer (BBR)

www.controls-group.com

Description

The Bending Beam Rheometer BBR test provides a measure of low temperature stiffness and relaxation properties of asphalt binders. These parameters give an indication of an asphalt binder's ability to resist low temperature cracking. The BBR is engineered to perform flexural tests on asphalt binder and similar specimens per ASTM D6648, AASHTO T313/ TP125 and EN 14771. These tests consist of a constant force being applied to a specimen in a chilled bath in order to derive specific rates of deformation at various temperatures.

AutoBBR basically consists in:

- A three-point bending test apparatus, easily lifted from the base unit by motorized system, for easy specimen removal, calibration and maintenance operations.
- A 7" color touchscreen controller, inbuilt in the machine base, displaying load/displacement and temperature data and graphs, able to automatically perform the required standard or user programmable testing procedures.
- A linear electromechanical actuator able to deliver the required load with high precision.
- Low temperature fluid bath, inbuilt in the machine base.
- An external chiller unit for the water-cooled thermoelectric temperature control system

A fully automatic system

AutoBBR can automatically perform standard test or customized tests. From the integrated controller, it is possible to set both load values and times for pre-load, test and recovery phases. Test data, including load, deformation and temperatures are displayed in real-time, together with relevant graphs. Test results can be saved into the large internal memory, saved on USB pendrive or transferred to PC with Ethernet connection.

Easy to calibrate

All verifications can be easily performed by the operator. The load cell is not temperature affected and the displacement measurement is compensated with regards to load cell deformation. Load cell verification can be automatically performed with dedicated procedure, and an external verification load cell is included with AutoBBR. It also includes a reference metal beam for displacement verification. The safety is granted by an emergency switch, and by safety buttons for AutoBBR assembly movement.

Main features

Vertical load by linear electromechanical actuator, temperature control by thermoelectrical cooling bath

Motorized lifting of BBR assembly for easy specimen removal, calibration and maintenance operations

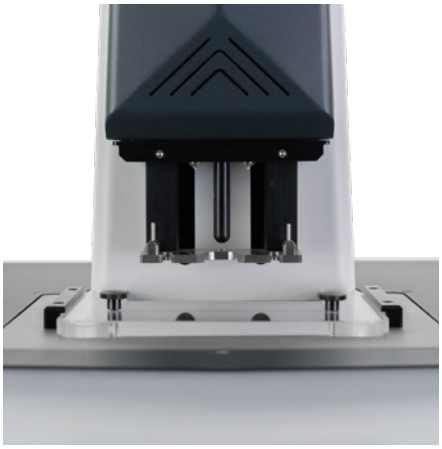
User interface by large 7" color touchscreen

Fully stand-alone operation by integrated firmware for automatic test performance, without the need of an external PC

External verification load cell included for automatic system load calibration

A complete system

AutoBBR is supplied complete with calibrated load cell, verification load cell and holder for automatic load verification, a complete specimen mould and crucible tongs to handle test specimens, displacement verification jig and reference bar for stiffness verification. Water chiller is also included.



Detail of the lifted test area

Enabling motorized BBR assembly

Specifications

Test configuration

- Linear electro-mechanical actuator, 10N capacity, 20mm travel
- Sample supports: 25 mm diameter, stainless steel, spaced 102.0 mm apart

Displacement specifications

- Displacement range: 20 mm
- Displacement resolution 1 µm
- Displacement measurement is compensated with regards to load cell deformation

Load specifications

Loading shaft: In-line technopolymer with blunt point

Load capacity: Adjustable from 0 to 10 N

Load resolution: 1 mN

Load accuracy: ± 3 mN through the test cycle

No effected by temperature

Automatic load calibration procedure (verification load cell included)

Water bath specifications

Range: ambient to -40 °C

Temperature measurement by PT100 probe

Resolution: 0.01 °C (0.1 °C display)

Controller specifications

- 7'' color touchscreen controller
- Real-time readings of displacement, load and bath temperature
- User defined test cycle (pre-load, recovery, and test load & time)
- Memory to store up to thousands test
- Possibility to store and download test on USB
- Connector for external load cell for automatic calibration
- Ethernet connection

Weight and dimensions

BBR

- Dimensions: 765 x 580 x 720 mm (H x W x D)
- Weight approx. 55 kg

Chiller

- Dimensions: 480 x 500 x 755 mm (H x W x D)
- Weight approx. 45 kg

Ordering Information

81-PV5912

AutoBBR, fully automatic electromechanical Bending Beam Rheometer (BBR), complete with frame with -40°C liquid bath, touchscreen display, calibration kit (verification load cell and holder for automatic load verification, displacement verification jig and reference bar for stiffness verification), a complete specimen mould, crucible tongs and water chiller.

Conforming to AASHTO T313, TP125, ASTM D6648 and EN 14771. 230V/50-60Hz/1ph

81-PV5914

Same as above, but 110V/60Hz/1ph

Accessories

81-PV5900/1

Additional BBR specimen mould, complete with o-ring set

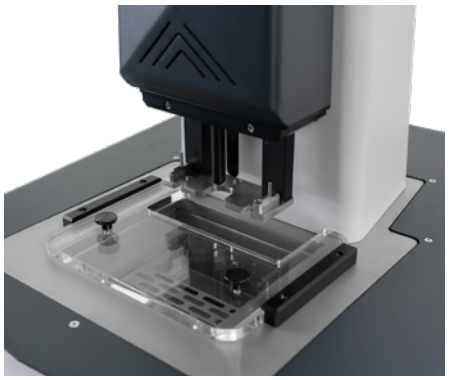
81-PV5900/2

Set of reference weights for reference load cell calibration

81-PV5900/3

Stand and water chiller cover for AutoBBR

AutoBBR assembly lifted by motorized system



Details of lifted test area

Detail of main switch, USB, Ethernet connections and load cell coonection

Mounting cooling bath protection

Mounting verification load cell for automatic load calibration

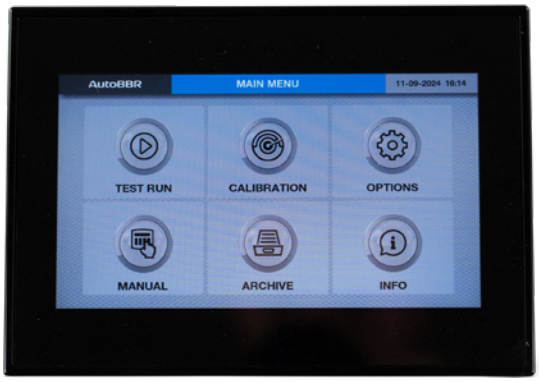
Displacement verification tool

Verification beam

Test setup by large touchscreen display

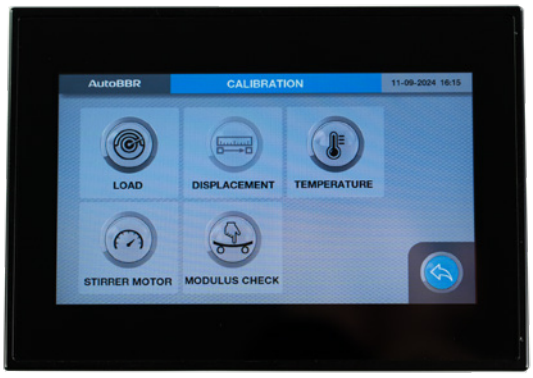
A fully stand-alone system

Thanks to its integrated firmware, AutoBBR is completely stand-alone and doesn't require an external PC to be operated. From the large touch-screen display, it is possible to automatically perform any test following international standards, or user defined sequences. During the test, real-time displacement, load and temperature graphs are displayed , and they are auto-scaled as needed for easy viewing. Test results can be stored into the internal memory, or downloaded to USB pendrive. Dedicated procedures for load and displacement calibration are included.



AutoBBR Main menu

Test settings setup



Calibration menu

Cooling bath setup

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For more information, please visit **www.controls-group.com.**

CONTROLS

Italy (HEAD OFFICE)
t +39 02 92184 1
f +39 02 92103 333
e sales@controls-group.com
www.controls-group.com

France
info-fr@controls-group.com

Mexico
info-mx@controls-group.com

Poland
info-pl@controls-group.com

UK
info-uk@controls-group.com

USA
info-usa@controls-group.com