

NEW

B041

GYROTRONIC - Superpave Gyrotory Compactor, Matest made

STANDARDS: EN 12697-10, EN 12697-31 / ASTM D6925 / AASHTO T312 / SHRP M-002

This Gyrotory Compactor, entirely developed and manufactured by Matest, is used to simulate and reproduce the real compaction conditions under actual road paving operations, hence determining the compaction properties of the asphalt. Such compaction is achieved in a fully automatic way, by combining the rotary action and the vertical resultant force applied by a mechanical head.

The Compactor comprises a highly rigid steel frame ensuring excellent angle control.

Load is applied by an electro-pneumatic cylinder, servo-controlled by a precision pressure regulator; the height is measured by a linear transducer.

Gyrotory motion is generated by an eccentric high precision system allowing an easy set up with precision and constant angle of gyration.

The rotation speed is controlled by an inverter through on board computer control.

Using the proper perforated mould, the Compactor is able to run tests also on cold emulsified asphalt mix.

The acquired results are also employed in the investigation of volumetric and mechanical characteristics of the asphalt mix.

The machine is calibrated at Matest factory with the internal angle set according to the Standard chosen by the customer:

- Angle set to 1,16° to meet ASTM D6925, AASHTO T312, SHRP M-002
- Angle set to 0,82° to meet EN 12697-10, EN 12697-31

section B

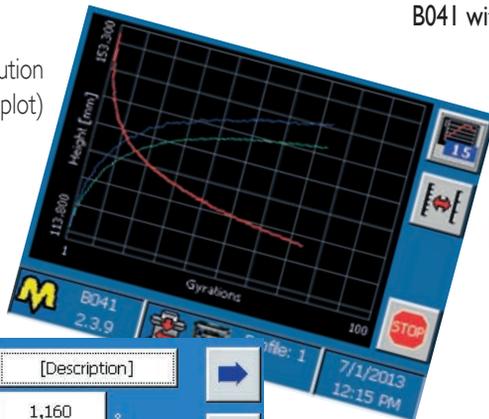


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B041 with mould

Test execution
(data plot)



Test description: [Description] [OK]

Angle: 1,160 ° [←] [→]

Load: 10,600 kN [←] [→]

Speed: 30,000 Rpm [←] [→]

Cycles: 100 [←] [→]

Mould: Ø150 [←] [→]

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Setting of test parameters

B041-20

MAIN FEATURES:

- Highly rigid steel frame ensuring excellent angle control, to meet the strict tolerances requested by EN Specifications.
- Electro-pneumatic action with servo-controlled regulator.
- Electronic control unit with touch screen color display, that runs like a standard PC based on Windows operating system.
- Software for acquisition and PC data processing.

The touch-screen icon interface allows an easy set up of the parameters and immediate automatic execution of the test, data acquisition, processing, graphics and file.

Direct connection to Intranet (connection to a LAN network) and Internet to establish a remote communication and receive an immediate diagnostic analysis of the potential problem from Matest technicians, or for software updates.

Unlimited memory storage with: 2 USB ports, 1 SD card.

Hardware technical details: see catalogue at page 24.

MATEST

TECHNICAL SPECIFICATIONS:

- Compacted specimen size: dia 100 and 150 mm; height from 0 to 200 mm for both sizes.
- Mould dimensions: Internal dia 100 and 150 mm; height 250 mm for both moulds.
- Gyrotory angle: adjustable from 0 to 2,4°
- Number of cycles (gyrotory): adjustable from 1 to 5000
- Gyration rate: adjustable from 5 to 60 work cycles/min (30 cycles/min requested by Standards)
- Vertical load on 150mm dia specimen: adjustable from 10 to 900 kPa (900 kPa with 9 bar compressor) (800 kPa with 8 bar compressor) (700 kPa with 7 bar compressor)
- Vertical load on 100 mm dia specimen: adjustable from 23 to 1500 kPa (with 7 bar compressor)
- The vertical load on the specimen is automatically controlled and adjusted by the electronic system.

Modes of operation:

- Compaction of specimen in accordance to the selected number of rotations.
- Compaction of specimen upon reaching the selected height.
- Compaction of specimen upon reaching the selected density.
- **The machine can also perform a final fluttering cycle at “zero” angle to obtain specimens with perpendicular faces.**

Data acquisition: number of rotations, specimen height, applied load (to assure tolerances requested by the Standards)

Requires pressurized air, minimum 7 bar:

The Matest Gyrotory Compactor is **supplied complete** with lubricant and power cord.

Optional extra are: moulds, filter paper, penetration pistons, extruder, bench, air compressor etc., to be ordered separately (see accessories)

Power supply: 230V 1ph 50/60 Hz 1000W 12A

Dimensions: 640x500x1050mm

Weight: 240 kg

AVAILABLE MODELS:

B041

Gyrotory compactor - ASTM

STANDARDS: ASTM D6925 / AASHTO T312 / SHRP M-002

The machine is calibrated at Matest factory and supplied with the internal angle set to 1,16° as requested by ASTM, AASHTO Specifications.

B041EN

Gyrotory compactor - EN

STANDARDS: EN 12697-10, EN 12697-31

The machine is calibrated at Matest factory and supplied with the internal angle set to 0,82° as requested by EN Specifications.

Gyrotory compactor with shear stress measurement device

This model is basically structured as mod. B041 and B041EN, but, in addition, **“it includes the shear stress measurement device”** and therefore it is recommended for both design and research purposes.

MAIN FEATURES:

- The device provides the most important parameters required to determine the main properties of asphalt mixes, and to predict their suitability for practical uses.
- Useful for research purposes and experimental studies, and increasingly being considered as a “needed accessory” in most of the worldwide markets.
- A group of load cells (integrated into the Gyrotory Compactor’s frame) measure all the involved forces acting on the specimen, which are analyzed by the software in order to calculate the effective shear stress value.
- Real time visualization of the instant shear stress value along the entire compaction process.
- Calculation of the resultant load’s eccentricity and consequently the effective tilting moment.
- Possibility to export the results into an Excel data report, which can be easily edited by the operator.

ADVANTAGES:

- The shear stress measurement device is integrated into the Gyrotory Compactor and therefore it doesn’t require any additional operation to be done by the user.
- The system comes already calibrated from the factory.
- Available either with ASTM configuration (internal angle: 1,16°) or EN configuration (internal angle: 0,82°).

AVAILABLE MODELS:

B041-01

Gyrotory compactor with shear stress measurement device - ASTM

STANDARDS: ASTM D6925 / AASHTO T312 7 SHRP M-002

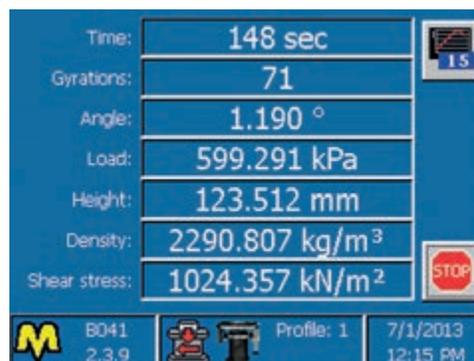
The machine is calibrated at Matest factory and supplied with the internal angle set to 1,16 ° as requested by ASTM, AASHTO Specifications.

B041-01 EN

Gyrotory compactor with shear stress measurement device - EN

STANDARDS: EN 12697-10, EN 12697-31

The machine is calibrated at Matest factory and supplied with the internal angle set to 0,82 ° as requested by EN Specifications.



Test execution with shear stress measurement

...follows...





ACCESSORIES to perform the test:

- B041-05** Hardened specimen cylinder 100 mm dia complete with bottom plate
- B041-06** Hardened specimen cylinder 150 mm dia complete with bottom plate
- B041-08** Hardened specimen cylinder 100 mm dia with holes for cold mix compaction, complete with bottom plate
- B041-09** Hardened specimen cylinder 150 mm dia with holes for cold mix compaction, complete with bottom plate
- B041-11** Top penetration piston 100 mm dia
- B041-12** Top penetration piston 150 mm dia

Metallic discs, to make easier the handling of specimens after the test, strongly recommended accessory for low-cohesion mixtures, such as draining asphalts:

- B041-13** Metallic disc for 100mm dia moulds. Pack of 2
- B041-14** Metallic disc for 150mm dia moulds. Pack of 2

Paper discs, to prevent asphalt from sticking to the piston and the mould's base plate, and to absorb bitumen in excess:

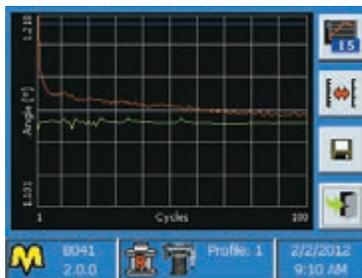
- B041-15** Filter paper for 100mm dia moulds. Pack of 100
- B041-16** Filter paper for 150mm dia moulds. Pack of 100

Hollow Punches for Gyratory Compactor:

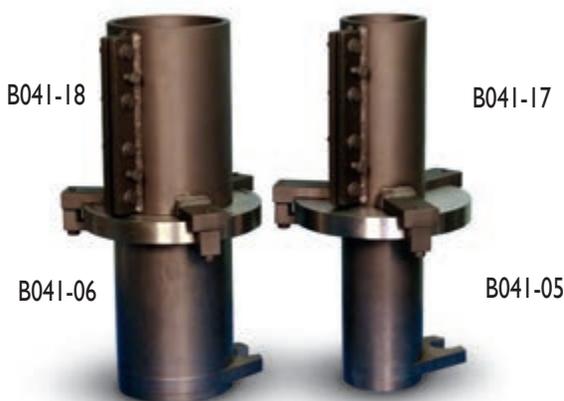
Used to maintain the core in the right shape and store cohesive asphalt samples after compaction.

Some asphalt mixes can be very unstable due to their high void ratio and large particle size. Wrapping the sample around the hollow punch will prevent it from crumbling down or receiving physical deformations once it is ejected from the mould. The material will then settle down and assume its stiff properties once it cools down after compaction:

- B041-17** Hollow Punch to stabilize and to mature the sample 100 mm dia.
- B041-18** Hollow Punch to stabilize and to mature the sample 150 mm dia.



Test data plot



B041-23 extruder with mould



B041-08

B041-09

ACCESSORIES for the Gyratory Compactor:

- V207** Air Compressor; pressure 10 bar. Technical details: see page 454
- B041-35** Filter group for condensed water removal from the compressed air. **(Necessary Accessory).**
- B041-20** Worktop for B041 and B041 EN, it can also accept the pneumatic specimen extruder (B041-23) and the integrated balance (B041-26)
- B041-19** Worktop for B041-01 and B041-01 EN, it can also accept the pneumatic specimen extruder (B041-23) and the integrated balance (B041-26)
- B041-23** Pneumatic automatic specimen extruder; it can be fixed to the worktop B041-20, or to any bench.



B041-05

B041-06



B041-26
BALANCE, “integrated” into the worktop, to facilitate the sample and the mould weightings, by avoiding the stress of lifting them.

The weighting reading values are directly and automatically displayed on the control panel of the Compactor.

Capacity: 30 kg

Accuracy: +/- 6 g

As alternative:

B041-27
BENCH for lateral bearing of a weighting balance.

Suggested balances:
 V075-13 Capacity 30kg div. 0,5g

or:

B041-24 Capacity 30kg div. 0,1g as requested by EN (or a balance of the customer)

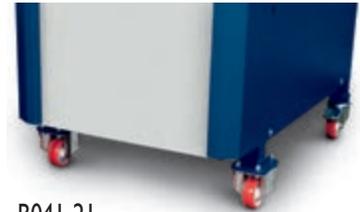


B041-06

V075-13

B041-27

B041-21
WHEELS (kit of 4) with brake, for an easy displacement of the Compactor in the laboratory.



B041-21



B041-26



Test configuration (balance)



End test data (with shear stress value)



B041-31

B041-30

B041-15

B041-16

B041-35

B041-30 Vertical force testing device with load ring.

As alternative:

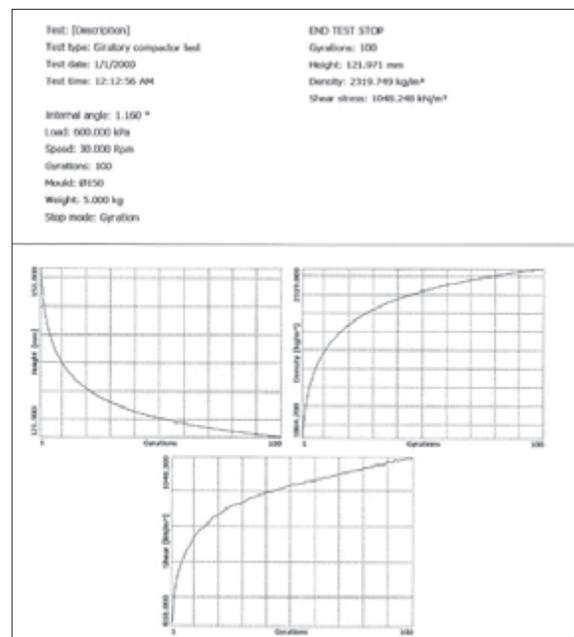
B041-31 Vertical force testing device with digital dynamometer.



B041-33

B041-33

Kit of 2 distance pieces of 105 and 115 mm high for the control of the height values measured by the linear transducer.



Final report

...follows...