

## MIXERS 20 AND 30 LITRES CAPACITY

These large capacity mixers have been designed to mix bituminous samples for compaction tests, Marshall and tensile splitting test and for other tests where uniformity is required. Thanks to the planetary action this mixer ensures a complete and uniform mixing. The machine is provided with a variable speed drive allowing to set a wide range of speeds:

- from 20 to 130 rpm for the planetary action
- from 60 to 390 rpm for the revolving action

The stainless steel protection grid can be lifted to inspect the bowl, and in this case the motor automatically turns off to prevent accidents to CE safety Directive. A timer allows to select the mixing time or the continuous mixing.

The mixer is supplied complete with stainless steel bowl, but **without** whisk beater, **without** coupling and **without** electric heater that must be ordered separately (see accessories).

**Note:** Mixer 20 litres capacity are bench type.  
Mixer 30 litres capacity are column freestanding type.

### AVAILABLE MODELS

#### B027

#### MIXER 20 LITRES CAPACITY

**Power supply:** 400V 3ph 50Hz 1.1kW

**Dimensions:** 700x570x950 mm. **Weight:** 135 kg approx.

#### B027SP

#### MIXER 20 LITRES CAPACITY

Identical to mod. B027 but with power supply:  
230V 1ph 50Hz 1.1kW

#### B027L

#### MIXER 30 LITRES CAPACITY

**Power supply:** 400V 3ph 50Hz 1.1kW

**Dimensions:** 750x600x960 mm. **Weight:** 200 kg approx.

#### B027LSP

#### MIXER 30 LITRES CAPACITY

Identical to mod. B027L, but with power supply: 230V 1ph 1.1kW



Model	B027 (20 litres)	B027L (30 litres)
WHISK THIN wire beater, EN Specifications	B027-03	B027-03L
WHISK THICK wire beater, EN Specifications	B027-06	B027-06L
COUPLING beater/shaft for B027-03(L), B027-06(L), B027-04(L)	B025-08	B025-08L

#### OTHER MODELS OF BEATERS, NOT CONFORMING TO STANDARDS:

BEATER, STAINLESS STEEL	B027-07	----
BEATER, aluminium	----	B027-02L
SPIRAL Beater	B027-04	B027-04L
HOOK Beater	B027-05	B027-05L
COUPLING beater/shaft for B027-02(L), B027-05(L), B027-07	B025-08	B025-08L

#### ISOMANTLE HEATER, electric, complete with thermoregulator.

The isomantle winding action of the bowl allows a more uniform heating of the bituminous sample.

Power supply: 230 V 1ph 50-60 Hz 1000 W	B027-01N	B027-01L
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BOWL, Stainless Steel, spare-part	B027-11	B027-11L
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**ARC****ASPHALT ROLLER COMPACTOR**

ADVANCED ELECTROMECHANICAL SYSTEM, HIGH LOAD, HOT ROLL, MULTI SIZE

STANDARDS: EN 12697-33 method 5.2 and EN 12697-33 annex A


**GERMAN PROCEDURE  
TP-ASPHALT StB 33  
APPROVED**
**B039****MAIN FEATURES**

- **40 kN vertical force.**
- Sturdy frame made of steel.
- Alternating displacement system, for table displacement and vertical load pressure.
- Integrated touch screen control unit based on Windows operating system.
- Easy management and analysis of data, test results, graphs.
- Touch-screen icon for an easy parameters set up and an immediate test execution.
- Unlimited memory storage with: 2 USB ports, 1 SD card slot.
- Direct Internet and Intranet (LAN) connection for remote technical assistance and for software updates (see p. 19).
- **Heating of the segment roller (optional).**
- Simple and quick roller and mould positioning.
- Perfect horizontal flatness of the slab surface.
- Uniform density and dimensions of the slabs.
- Easy to maintain.
- Energy controlled compaction procedure.
- Silent compaction.

HIGH  
LOADHOT  
ROLLMULTI  
SIZEHEATED  
CARTPERFECT  
SLAB  
FLATNESSTHERMAL  
SHOCK  
PREVENTION



**B039****ARC****ASPHALT ROLLER COMPACTOR**

ADVANCED ELECTROMECHANICAL SYSTEM, HIGH LOAD, HOT ROLL, MULTI SIZE

STANDARD: EN 12697-33 method 5.2 and EN 12697-33 annex A | ASTM D8079

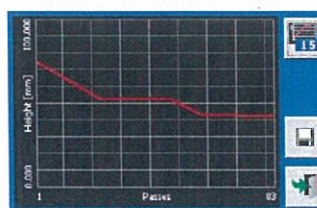
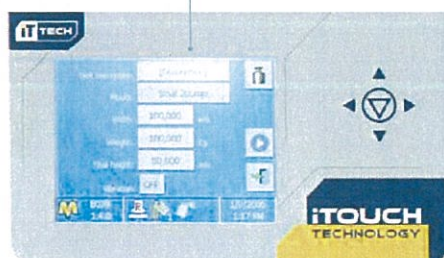
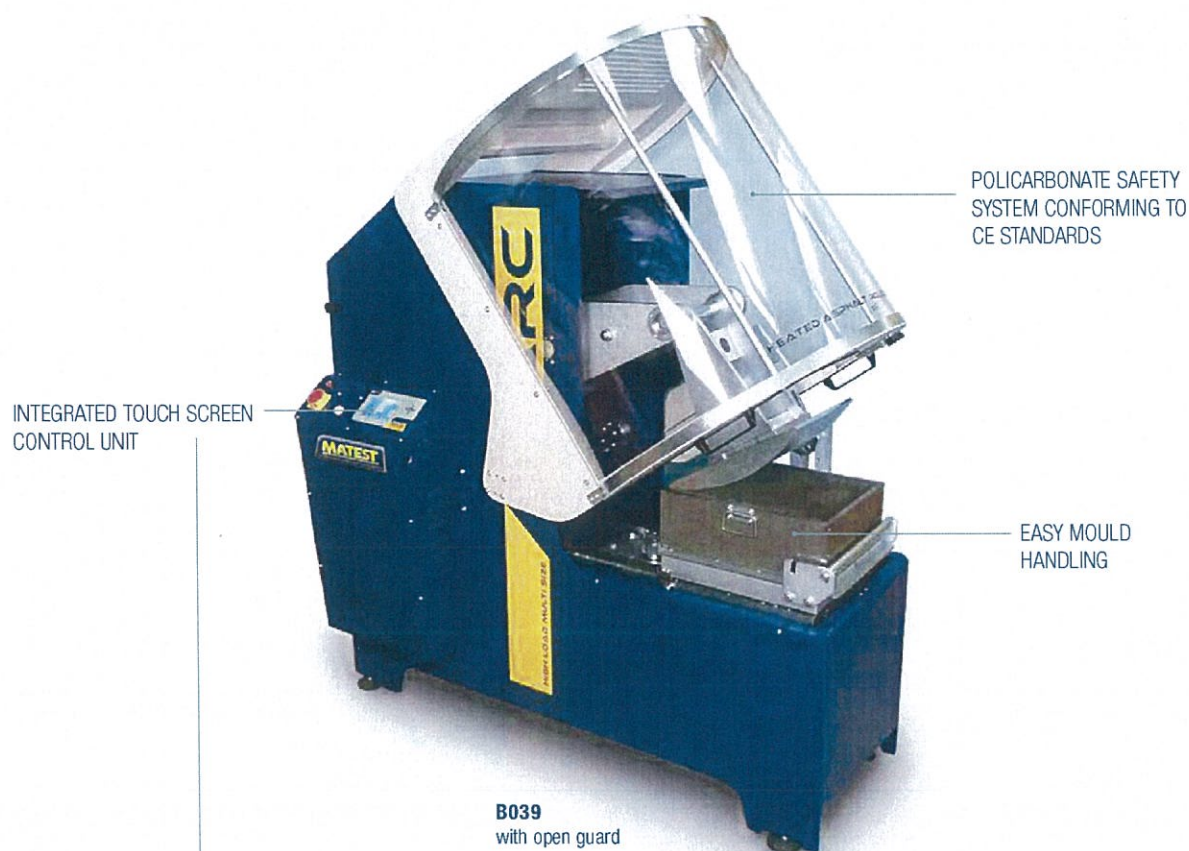
Asphalt Roller Compactor is entirely developed and manufactured by Matest. The machine works with an **electromechanical system, and therefore it does not require any air source (compressor) or hydraulic pressure.**

It is used to produce representative sample slabs of several dimensions of bituminous mixtures laid and compacted on site.

The compaction is performed through a segmented roller with alternated operated rotation which simulates the on-site action of a street roller.

The compaction cycle can be programmed in accordance to a certain load or deformation value.

The flexibility of the program grants the production of samples with uniform density and dimensions, fully meeting Standards specifications and research requirements; these samples are compatible for rut test with Matest Wheel Tracking apparatus B038 (see p. 112) and Matest Smartracker B038A (see p. 114). The sample slabs can be also cored or cut off to obtain cylinders and beams for bending fatigue, indirect tensile, static and dynamic creep, stiffness, and 4-point tests.



Energy controlled compaction procedure required by pr EN 12697-33 method 7.2 Annex A and TP Asphalt





- Possibility to use **standard or heated segment rollers of different sizes** (see accessories): width up to 400 mm, length up to 500 mm and radius 490 mm, to obtain slabs of
  - 500x400 mm, thick up to 180 mm
  - 400x305x25 to 100 mm thick
  - 320 x260 mm, thick up to 180 mm
  - 305x305x25 to 100 mm thick
- Vertical force selectable up to max. 40 kN (for all machine)
- **Programmable density target compaction**
- Polycarbonate safety guard as requested by CE Directive
- Possibility to **perform the two-phase procedure (Pre-compaction and Compaction)** as specified by TP Asphalt-StB 33 and EN 12697-33 annex A
- The required n° of passes can be set before starting the test allowing an accurate test control by n° of passes
- **Sliding carriage speed adjustable** between 3 m/min and 12 m/min
- **Detailed output file** listing each pass and displaying duration, sample height, applied load and eventual roller and cart temperature
- Longitudinal compaction
- Power supply:** 230 V 50-60 Hz 1ph 2100 W  
(3100W with the heated segment roller)
- Dimensions:** 2200x1030x1880 mm  
(2410 mm with opened guard)
- Weight:** 1300 kg approx.



The Roller Compactor is supplied **without** roller segment, slab mould, centering plate, that must be ordered separately (see accessories).





**“STANDARD” SEGMENT ROLLER**, available dimensions:

- 
- The image displays four stainless steel food storage containers and their corresponding bases. The containers are labeled B038-09, B038-18, B038-13, and B038-10. The bases are labeled B039-04R, B039-05R, B039-06NR, and B039-07R. The containers are made of stainless steel and have a handle on the front. The bases are made of a light-colored material, possibly plastic or aluminum, and have various ports and connectors on the top surface.

**B039-21N** CENTERING PLATE for 400x305 mm mould  
**B039-22** CENTERING PLATE for 305x305 mm mould  
**B039-23** CENTERING PLATE for 320x260 mm mould  
**B039-15** ROLLING VIBRATING DEVICE, reproducing street-roller vibrations during asphalt laying off.

**B039-03**

CHISMA  
PROS G  
www





## Muffle Furnaces up to 1100 °C or 1200 °C

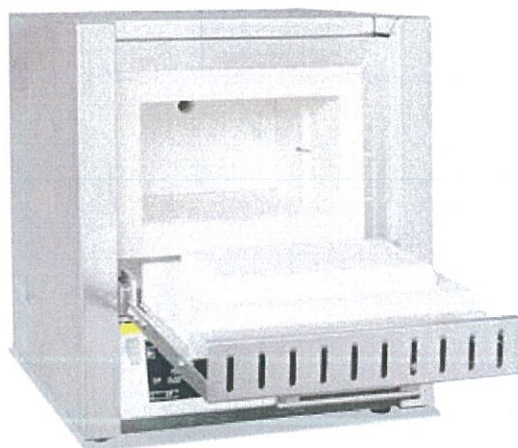
The muffle furnaces L 1/12 - LT 40/12 have been proven for daily laboratory use. These models stand out for their excellent workmanship, advanced and attractive design, and high level of reliability. The muffle furnaces come equipped with either a flap door or lift door at no extra charge.



Muffle furnace LT 5/12 with lift door

### Standard Equipment

- Tmax 1100 °C or 1200 °C
- Heating from two sides by ceramic heating plates (heating from three sides for muffle furnaces L 24/11 - LT 40/12) for an optimal temperature uniformity
- Temperature uniformity of  $\pm 5$  K with closed fresh-air inlet in empty work space according to DIN 17052-1 at working temperatures above 800 °C see page 71
- Thermocouple type N (1100 °C) or type S (1200 °C)
- Ceramic heating plates with integral heating element which is safeguarded and easy to replace
- Optional flap door (L) which can be used as work platform or lift door (LT) with hot surface facing away from the operator
- Adjustable air inlet integrated in door (see illustration)
- Exhaust air outlet in rear wall of furnace
- Controller B410 resp. R7 for L 1/12 (5 programs with each 4 segments), alternative controllers see page 75



Muffle furnace L 3/11 with flap door

### Additional Equipment

- Chimney, chimney with fan or catalytic converter (not for L 1 and L 15) see page 24
- Over-temperature limiter with adjustable cutout temperature as temperature limiter to protect the oven and load
- Protective gas connection to purge with non-flammable protective or reaction gases (not available in combination with chimney, chimney with fan or catalytic converter) not gas tight
- Manual or automatic gas supply system
- Port for thermocouple in the rear wall or in the furnace door
- Charging rack with closed or perforated trays for loading the furnace in two levels incl. holder for inserting/removing the trays up to a max. temperature of 800°C and a max. loading weight of 2 kg for the L(T) 9/11 respectively 3 kg for the L(T) 15/11
- Please see page 25 for more accessories





Muffle furnace L 3/12



Muffle furnace L 3/11 with flap door

Model		Tmax	Inner dimensions in mm			Volume	Outer dimensions² in mm			Temperature uniformity of +/- 5K in the empty workspace			Connected load	Electrical	Weight	Heating time
		in °C¹	w	d	h	in l	W	D	H³	w	d	h	in kW	connection⁴	in kg	in min¹
L(T)	3/11	1100	160	140	100	3	385	330	405+155	110	50	50	1.2	1-phase	20	40
L(T)	5/11	1100	200	170	130	5	385	390	460+205	170	80	90	2.4	1-phase	30	50
L(T)	9/11	1100	230	240	170	9	415	455	515+240	180	150	120	3.0	1-phase	35	65
L(T)	15/11	1100	230	340	170	15	415	555	515+240	180	250	120	3.2	1-phase	40	75
L(T)	24/11	1100	280	340	250	24	490	555	580+320	230	250	200	4.5	3-phase	55	70
L(T)	40/11	1100	320	490	250	40	530	705	580+320	270	400	200	6.0	3-phase	65	75
L	1/12	1200	90	115	110	1	290	280	430	45	60	40	1.5	1-phase	10	25
L(T)	3/12	1200	160	140	100	3	385	330	405+155	110	50	50	1.2	1-phase	20	45
L(T)	5/12	1200	200	170	130	5	385	390	460+205	170	80	90	2.4	1-phase	30	60
L(T)	9/12	1200	230	240	170	9	415	455	515+240	180	150	120	3.0	1-phase	35	75
L(T)	15/12	1200	230	340	170	15	415	555	515+240	180	250	120	3.2	1-phase	40	85
L(T)	24/12	1200	280	340	250	24	490	555	580+320	230	250	200	4.5	3-phase	55	80
L(T)	40/12	1200	320	490	250	40	530	705	580+320	270	400	200	6.0	3-phase	65	85

<sup>1</sup>Recommended working temperature for processes with longer dwell times is 1000 °C (L./11) resp. 1100 °C (L./12)

<sup>2</sup>External dimensions vary when furnace is equipped with additional equipment. Dimensions on request.

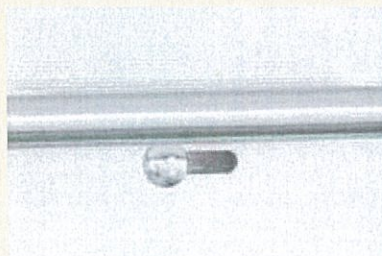
<sup>3</sup>Including opened lift door (LT models)

<sup>4</sup>Heating time of the empty and closed furnace up to Tmax - 100 K (connected to 230 V 1/N/PE resp. 400 V 3/N/PE)

\*Please see page 75 for more information about supply voltage



Chimney with fan

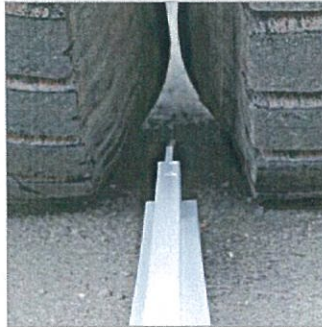


Adjustable air inlet integrated in the door



Gas supply system for non-flammable protective or reactive gas





[Operation](#)

[Video](#)

[Download](#)

## Anix Benkelman Beam AX06

The Benkelman Beam enables precise and non-destructive measurements of the load-bearing capacity of road surface layers made of asphalt or pavement. In the case of concrete road surface pavements, movements of the slab edges can be measured in order to draw conclusions about the lateral force transmission in the area of the joints. It is a low-cost alternative to the FWD (Falling Weight Deflectometer) and is described by the German Road and Transportation Research Association (FGSV) in the Working Paper 443 „Tragfähigkeit von Verkehrsflächenbefestigungen“ (Load-bearing capacity of road surface pavements), Part B 1 Benkelman Beams: „Gerätebeschreibung, Messdurchführung“ (Device description, measurement execution), and Part C 1 Benkelman Beams: „Auswertung und Bewertung von Einsenkungsmessungen“ (Analysis and evaluation of subsidence measurements) (available from [FGSV Publishing](#) under no. [433](#) [in German]).

## Fields of Application



Benkelman Beam, mounted behind the truck



Measuring case of the dual-gauge Benkelman Beam





In conjunction with additional tests, the Benkelman Beam is used to determine the load-bearing capacity of roads for

- Identification of visually undetectable weak points
- Formation of homogeneous roads sections with comparable load-bearing capacity
- Recording of load-bearing behavior over longer periods and after extreme hydrological events
- Identification of structural causes of damage and assessment of structural condition
- Selection of appropriate road maintenance measures

### Measurement Process

With the Benkelman Beam measurement method, the vertical deflection of the road surface is measured after a defined load of 5 tons has rolled away. It is a quasi-static procedure. The vertical deflection is recorded by a special measuring beam, which is mounted on a support frame that can be rotated at a ratio of 1:2. A loaded vehicle with a dual tire rear axle and 5-ton wheel load is used for the defined load. The measuring tip of the Benkelman Beam at the end of the front lever arm is placed exactly in the middle between the dual tires and a dial gauge (or other device) is attached to the end of the rear lever of the beam to record the movement.

The dial gauge is set to zero before the measurement begins. The load vehicle moves away and the pavement surface rebound is read from the dial gauge. The modulus of elasticity of the layer(s) can then be determined from the wheel load and rebound deflection.

### Dual-Gauge Benkelman Beam

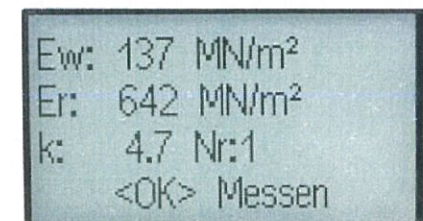
The Benkelman Beam is available in two versions: a classic variant with one dial gauge and the dual-gauge variant. With the dual-gauge variant, an additional point of the deformation trough is recorded (at a distance of approx. 50 cm from the first point). This allows conclusions to be drawn about the deformation modulus of the subgrade in addition to the modulus of the asphalt layer. The Benkelman Beams manufactured by us use two inductive displacement sensors



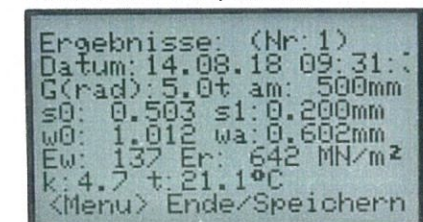
Surface thermometer integrated on the underside of the measuring case



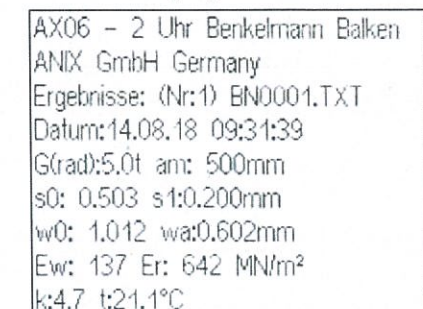
Display of the dual-gauge Benkelman Beam during measurement



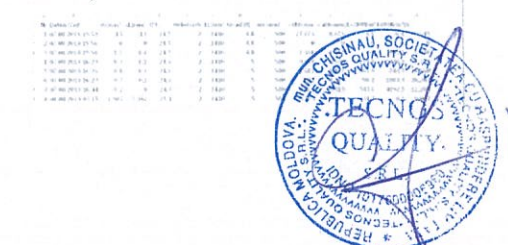
Result display: deformation moduli and temperature



Detailed display of results



Protocol of a measurement printed out with the integrated mini printer





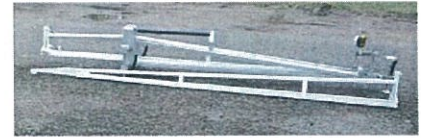
and the proven Anix electronics for the measurement instead of two measuring dial gauges. The housing of the measuring case and the sensors are waterproof. The additional external buttons allow the measuring case to be used – after closing the transparent lid – even under adverse environmental conditions, for example in rainy weather. It has a built-in mini printer with which small test reports can be output on the construction site. The internal NiMH battery is fast rechargeable (< 2 hours charging time) and allows continuous operation for up to 35 hours. The measuring case is equipped with a surface thermometer which is permanently mounted under the front. The measurements can also be stored on an SD card. The data of a measurement series are continuously saved to a file, so that they can be further processed later, for example with Excel. The measurement is evaluated according to the Müller method. The equivalent deformation moduli  $E_{e,W}$  (equivalent modulus of elasticity of the subgrade) and  $E_{e,R}$  (equivalent modulus of elasticity of the asphalt) are calculated. The stiffness ratio  $k$  ( $E_{e,R} / E_{e,W}$ ) can be used to draw conclusions about the quality of the subgrade and the asphalt layer:

- $k < 1$ : Subgrade has high bearing capacity and/or poor asphalt
- $k = 5..10$ : Thick/very hard asphalt



Dual-gauge Benkelman Beam, fully assembled

Excel table showing multiple Benkelman Beam measurement data



Benkelman Beam, disassembled for transport



Probe tip, mounted and screwed on

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 Hintern Hecken 1, 39179 Meitzendorf - Barleben  
 Tel: +49 39202 8792-52, [info@anix.biz](mailto:info@anix.biz)





## GYROTRONIC SUPERPAVE GYRATORY COMPACTOR

STANDARDS: EN 12697-10, EN 12697-31 | ASTM D6925 | AASHTO T312, TP4 | SHRP M-002

This Gyrotronic 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.

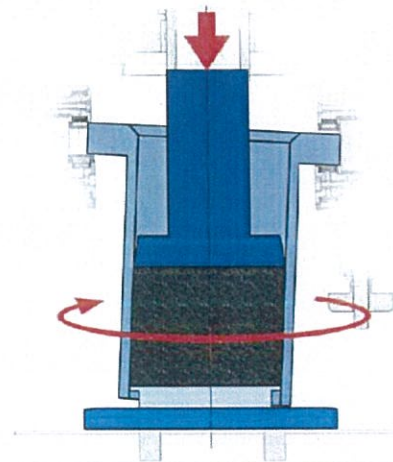


B041 with accessories

### MAIN FEATURES

- Rigid steel frame ensuring excellent angle control.
- Electro-pneumatic action with servo-controlled regulator.
- Full color touch screen control unit, running like a standard PC based on Windows operating system.
- Software for PC control acquisition and data processing.
- Optional shear stress measurement.
- Concept based on American DOT principles.
- Cold mix emulsions which can be compacted.
- Optional integrated balance.
- Optional integrated extruder.
- Gyrotronic angle adjustable from 0 to 2.4° (up to 3°).
- Electromechanical version available on request.

Gyrotronic working principle precisely meets the international Standards specifications avoiding any interpretation deviation. Its stable mechanism with gears and bearings is embedded inside a sturdy frame.



### A SUCCESSFUL PRODUCT

- COST COMPETITIVE
- TRIED AND PROVEN
- OVER 50 UNITS DELIVERED EVERY YEAR





## GYROTRONIC - SUPERPAVE GYRATORY COMPACTOR

Gyrotronic compacts 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.

Gyratory 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 to the selected internal angle.**

### ADVANTAGES OF AN ELECTRO-PNEUMATIC COMPACTION SYSTEM

The Gyrotronic is equipped with a high performance, value engineered, **electro-pneumatic loading system**. The vertical actuator is low friction pneumatic cylinder and allows to apply constant stress regardless of the response of the specimen. In this way, the compaction is strictly performed in stress control and load/stress spikes are prevented. This concept provides a simple, cost effective solution with **reduced maintenance requirement**.

### ON-BOARD TOUCH SCREEN or PC CONTROL

The touch-screen icon interface allows an easy set up of the parameters and an immediate automatic execution of the test, data acquisition and processing, graphics and file. A remote test control is available through a dedicated software, provided in bundle.

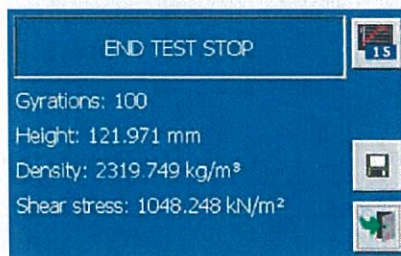
Direct connection to Intranet (through LAN network) and Internet to establish a remote communication and receive an immediate diagnostic of potential problems from Matest technicians, or for software updates.

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

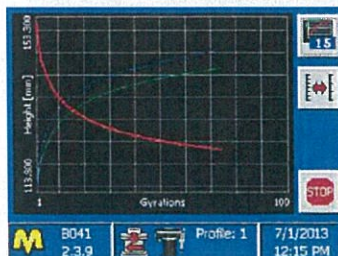
Hardware technical details: see catalogue at p. 19.



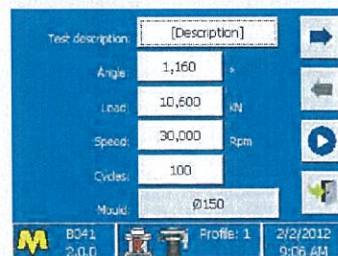




End test data (with shear stress value)



Test execution (data plot)



Setting of test parameters

### TECHNICAL SPECIFICATIONS

- Compacted specimen size: Ø 100 and 150 mm; height from 0 to 200 mm for both sizes.
- Mould dimensions: Internal Ø 100 and 150 mm; height 250 mm for both moulds.
- Gyratory angle: adjustable from 0 to 2.4° (up to 3°)
- Number of cycles (gyratory): adjustable from 1 to 5000
- Gyration rate: adjustable from 5 to 60 work cycles/min (30 cycles/min requested by Standards)
- Vertical load on Ø 150 mm specimen:  
adjustable from 10 to 1000 kPa (1000 kPa with 10 bar compressor)  
(800 kPa with 8 bar compressor)  
(700 kPa with 7 bar compressor)
- Vertical load on Ø 100 mm 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 flatterting cycle at "zero" angle to obtain specimens with perpendicular faces.**

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

Requires pressurized air, minimum 7 bar.

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

**Optional extra are:** moulds, filter paper, penetration pistons, extruder, bench, air compressor Accredia official vertical load calibration certificate, to be ordered separately (see accessories)

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

**Dimensions:** 640x500x1050 mm

**Weight:** 240 kg approx.

Overview of mechanical  
"heart"



Compaction phase:  
simultaneous action of  
a static compression  
and of the shearing  
action



### AVAILABLE MODELS

#### B041 GYRATORY 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.

**Note:** Electromechanical Gyratory Compactor version available on request.

#### B041EN GYRATORY 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.





## GYROTRONIC WITH SHEAR STRESS - RESEARCH GYRATORY COMPACTOR

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.

The device provides the most important parameters required to determine the main properties of asphalt mixes, and to predict their suitability for practical uses. This integrated measurement allows user to perform tests without any additional operation. The system comes already calibrated from the factory.

### MAIN FEATURES

- Integrated shear stress measurement.
- A dedicated group of load cells measures all the involved forces acting on the specimen and through our software the effective shear stress value is calculated.
- Real time display of the instant shear stress value along with the entire compaction process.
- Calculation of the resultant load eccentricity and consequently the effective tilting moment.
- Results exportable into an Excel data report, which can be easily edited by the user.



Time:	148 sec	LS
Gyrations:	71	
Angle:	1.190 °	
Load:	599.291 kPa	
Height:	123.512 mm	
Density:	2290.807 kg/m <sup>3</sup>	STOP
Shear stress:	1024.357 kN/m <sup>2</sup>	
M B041 2.3.9	Profile: 1	7/1/2013 12:15 PM

Test execution with shear stress measurement





## GYROTRONIC EXCEEDS THE STANDARDS

The R&D department is continuously committed to improve the performance of SGC compactors. Matest aims to meet any type of need and purpose, from academics to researchers and routine testing laboratories, through a constant attention to quality.

The annual revisions have led to the development of a high performance electro-compaction system that exceeds the standard indications.

- Applies constant stress regardless the specimen response
- No rigid reaction to specimen behaviour
- Easy to control
- Inherently good stress/load control
- Cost competitive with low maintenance
- Reliable and precise

The following table clearly shows the reasons why Gyrotronic goes beyond the acknowledged figures.

					
CONSOLIDATION PRESSURE	600 kPa	600 kPa	600 kPa	600 kPa	10...1000 kPa (150 mm samples) 23...1500 kPa (100 mm samples)
ANGLE	0.82°	1.16°	1.16°	1.25°	Adjustable 0...2.4° (up to 3°)
GYRATIONS/MIN	30	30	30	30	Adjustable 5...60

## GYROTRONIC AND ACCURACY

Gyrotropic strictly maintains the compaction angle, exceeding the EN and ASTM standards. In fact, the angle IEA240 is precisely defined within an accuracy of  $\pm 0.003^\circ$ .

Also, all specifications defined in the EN 12697-31 Annex C are complied and exceeded. The maximum difference between the four individual measurements, that gives an idea about the **planarity of top and bottom faces**, is completely under the standards limit.

Another aspect is the parallelism between top and bottom faces: the difference between the Internal Top Angle, **ITA**, and the Internal Bottom Angle, **IBA**, also indicated as **δTB** meets and exceeds the standard.

The compacted specimens will be perfect for mechanical analysis: parallelism between top and bottom plane, associated with right planarity, and perpendicularity between vertical walls and each plane are the fully guaranteed.

	ASTM D6925 ASTM D7115 AASHTO T312	EN 12697-31	MATEST
PRESSURE	600±18 kPa	600±18 kPa	
ANGLE, IEA <sub>240</sub>	1.16°±0.02°	0.82°±0.02°	1.16° ± 0.003°
			0.82°± 0.003°
$\delta_{TB} = ITA - IBA$		<0.10°	<0.02°
Max difference between individual measurements		<0.05°	<0.02°
$\delta_{LI} = IEA_{240} - IEA_{425}$		<0.10°	<0.07



## AVAILABLE MODELS

**B041-01  
RESEARCH GYRATORY COMPACTOR - 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  
RESEARCH GYRATORY 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.

## ACCESSORIES to perform the test (for all Gyrotronic models)

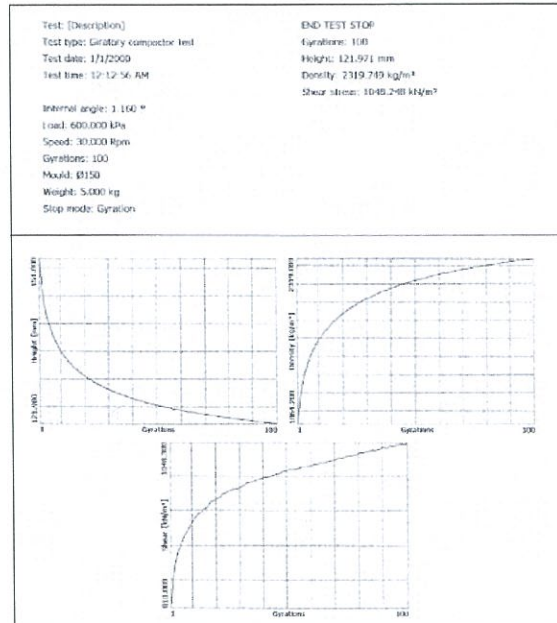
- B041-05** HARDENED SPECIMEN CYLINDER Ø 100 mm complete with bottom plate  
**B041-06** HARDENED SPECIMEN CYLINDER Ø 150 mm complete with bottom plate  
**B041-08** HARDENED SPECIMEN CYLINDER Ø 100 mm with holes for cold mix compaction, complete with bottom plate  
**B041-09** HARDENED SPECIMEN CYLINDER Ø 150 mm with holes for cold mix compaction, complete with bottom plate  
**B041-11** TOP PENETRATION PISTON Ø 100 mm  
**B041-12** TOP PENETRATION PISTON Ø 150 mm

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 Ø 100 mm moulds. Pack of 2  
**B041-14** METALLIC DISC for Ø 150 mm 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 Ø 100 mm moulds. Pack of 100  
**B041-16** FILTER PAPER for Ø 150 mm moulds. Pack of 100



Final report

## 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 Ø 100 mm

**B041-18**

HOLLOW PUNCH to stabilize and to mature the sample Ø 150 mm





**ACCESSORIES for the Gyratory Compactor:**

**B041-20** WORKTOP for B041 and B041EN, it can also accept the pneumatic specimen extruder (B041-23) and the integrated balance (B041-26)

or:

**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 B041-19, B041-20, or to any bench.

**V207** AIR COMPRESSOR, pressure 10 bar.  
Technical details: see p. 598

**B041-35** FILTER GROUP for condensed water removal from the compressed air. (needed accessory).

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

**B041-30** VERTICAL FORCE TESTING DEVICE with load ring.

As alternative:

**B041-31** VERTICAL FORCE TESTING DEVICE with digital dynamometer.

**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.

**B041-34** ACCREDIA official vertical load calibration certificate.


**WEIGHTING SOLUTIONS**
**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:  $\pm 6$  g


**OR B041-27**

**BENCH** for lateral bearing of a weighting balance.

Suggested balance:

V075-13 Capacity 30 kg div. 0.5 g

or:

**B041-24** Capacity 30 kg div. 0.1g as requested by EN  
(or a balance of the customer)





# FRAASS APPARATUS BREAKING POINT

STANDARD: EN 12593

This apparatus is used to determine the breaking point of semisolid and solid bitumes. It consists in a flexure device with two concentric sliding resin tubes, jaws for the test specimen, flexure system with handle, cooling device with three containers, plate in special harmonic steel, thermometer IP 42C.

**Weight:** 4 kg approx.

## SPARES

**B077-01** Plate (spring) in special harmonic steel





**B031N1****MARSHALL AUTOMATIC EN (IMPACT) COMPACTOR**

STANDARDS: EN 12697-10, 12697-30 | comparable to: BS 598:107

This ruggedly constructed apparatus automatically compacts the bituminous sample and stops off the motor after the preset number of blows has been completed on the automatic digital display counter.

The trip mechanism is structured so that the sliding hammer falls at the same height at every blow.

The mould is held in position by a fast clamping device.

The compactor includes a vibrated concrete base where a laminate hardwood block is mounted.

Total weight of the compaction hammer (Rod + Foot + Sliding mass):  $7850 \pm 50$  g

Sliding mass weight:  $4535 \pm 15$  g

Free fall height:  $457 \pm 5$  mm

Blow frequency: 50 blows in 55/60 seconds

The machine is equipped with safety door, conforming to CE Safety Directive.

When opened it stops automatically and cannot operate.

The control panel can be wall fixed or placed on a bench.

All moving parts are quickly/easily accessible for maintenance.

The compactor is supplied complete, **except for the mould** that must be ordered separately.

**Power supply:**

230V 1ph 50Hz 300W

**Dimensions:**

500x500x1890 mm

**Weight:** 220 kg approx.

**B031N 1 + B031-01****B031N 1****ACCESSORY****B031-01**

CABINET, lined with sound-proofing material for noise reduction within CE limits.

Dimensions: 800x800x2000 mm approx.

Weight: 100 kg approx.

**SPARE**

**B033-11N** Compaction Hammer complete

**B029N-KIT****MARSHALL COMPACTION MOULD, Ø 4"**

STANDARDS: EN 12697-10 | EN 12697-30 | NF P98-251-2

Inside diameter: 101.6 mm (4")

Steel manufactured, plated against corrosion.

**Weight:** 3.150 g

Consisting of:

**B030N** MOULD BODY only. Weight: 1300 g

**B030-01N** FILLING COLLAR only. Weight: 850 g

**B030-02N** BASE PLATE only. Weight: 1000 g

**Note:** French NF P98-251-2 Spec. requires the filling collar with a small different dimension, but fitting perfectly the mould body and the baseplate.

**ACCESSORIES**

**B030-01NF** FILLING COLLAR only (NF P98-251-2). Weight: 850g

**B030-03** EXTRACTION PLATE, to eject specimens from the mould. It is used in conjunction with B030-04 receiver. Weight: 1400 g

**B030-04** SPECIMEN RECEIVER, used to receive the specimens ejected by the B030-03 extruder. Weight: 1300 g

**B030-05** FILTER DISC Ø 100 mm. Pack of 100





TABLE OF THE SIEVES 200 MM DIAMETER FOR THE AIR JET SIEVING MACHINE

The frame is stainless steel made.

- Openings from 5 to 41 microns have **nylon mesh**
  - Openings from 45 to 4000 microns have **stainless steel mesh**
  - \*The opening of 65 microns has **nylon mesh**
- The sieves include airproof rubber seal.



A058-20...A058-96

Model	Aperture micron	Model	Aperture micron	Model	Aperture micron	Model	Aperture micron
A058-20	5	A058-38	71	A058-65	280	A058-81	1120
A058-21	10	A058-50	75	A058-66	300	A058-82	1180
A058-22	15	A058-51	80	A058-67	315	A058-83	1250
A058-23	20	A058-52	90	A058-68	355	A058-84	1400
A058-24	25	A058-53	100	A058-69	400	A058-85	1600
A058-25	28	A058-54	106	A058-70	425	A058-86	1700
A058-26	30	A058-55	112	A058-71	450	A058-87	1800
A058-27	37	A058-56	125	A058-72	500	A058-88	2000
A058-28	41	A058-57	140	A058-73	560	A058-89	2240
A058-97	45	A058-58	150	A058-74	600	A058-90	2360
A058-30	50	A058-59	160	A058-75	630	A058-91	2500
A058-31	53	A058-60	180	A058-76	710	A058-92	2800
A058-32	56	A058-61	200	A058-77	800	A058-93	3150
A058-35	63	A058-62	212	A058-78	850	A058-94	3350
A058-36*	65	A058-63	224	A058-79	900	A058-95	3550
A058-37	70	A058-64	250	A058-80	1000	A058-96	4000



**B067N****VACUUM PYKNOMETER 10 LITRES CAPACITY**

THEORETICAL MAXIMUM SPECIFIC GRAVITY OF  
LOOSE ASPHALT MIXTURES (RICE-TEST)

STANDARDS: EN 12697-5 | ASTM D2041

Transparent plexiglass made, complete with valve and gauge, it is used for a rapid determination of bulk specific gravity of aggregates, the max. theoretic specific gravity of bituminous uncompacted road mixtures and the percent air voids in compacted mixtures. To perform the test a minimum ultimate vacuum of 30mm/Hg is requested.

**Dimensions:** Ø 300x450 mm high

**Weight:** 8 kg approx.

**B067-01N****VACUUM PYKNOMETER**

Same as model B067N but with a higher useful height (270 mm) conforming to TP Asphalt StB T5 standard.

**ACCESSORIES for B067N and B067T****A059-02 KIT**

VIBRO-DEAERATOR, ELECTROMAGNETIC with adjustable vibrating intensity. To vibrate the pyknometer for the evacuation of the air. Complete with fixing device to the pyknometer. This unit can be used also as a Sieve Shaker. Technical details: see Section A p. 40

**V205-01 + V205-10 + V205-12 + V230-03**

VACUUM PUMP, PORTABLE TWO STAGES, complete with vacuum regulator and condensed water trap, tubing 3 m long.

Technical details: see Section V p. 597

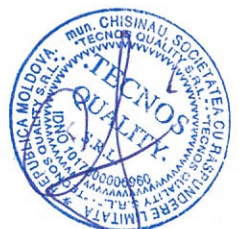
**B067T****PYKNOMETER, 10 LITRE CAPACITY**

STANDARDS: ASTM D 2041 | EN 12697-5

For theoretical maximum density of bitumen.

Plastic made, 250 mm diameter with valve and vacuum gauge

**Weight:** 5 kg approx.

**B067T****V205-01 + V205-10 + V205-12 + V230-03****A059-02 KIT**



**A075N****LOS ANGELES ABRASION MACHINE****DETERMINATION OF RESISTANCE TO FRAGMENTATION**

STANDARDS: EN1097-2 | ASTM C131 | UNI 8520-19 | EN 12697-17 | EN 12697-43 | NF P18-573 | AASHTO T96 | CNR N° 34

Used to determine the resistance of aggregates to abrasion.

It comprises a heavy steel cylinder of 711 mm inside diameter x 508 mm inside length, mounted on a base frame.

The cylinder rotates at a speed of between 31 and 33 rpm.

The machine is fitted with an automatic digital counter which can be preset to the required number of revolutions of the drum.

The cylinder is counterbalanced so that the filling opening stays in position without tilting;

a push-button allows to position such opening for the loading/unloading operations.

The control panel can be wall fixed or placed on a bench.

Supplied **without** abrasive charges which have to be ordered separately according to the requested Standards. It cannot be sold on the CE markets without its protections (see accessories).

**Power supply:** 230V 50Hz 1ph 750W

**Dimensions:** 1000x800x1000 mm

**Weight:** 370 kg approx.

**A075N****NEEDED ACCESSORY**

**A076-01** SET OF 12 ABRASIVE CHARGES, conforming to ASTM AASHTO | CNR | UNI | UNE | NLT Standards.

or:

**A076-02** SET OF 12 ABRASIVE CHARGES, conforming to EN | NF Standards.

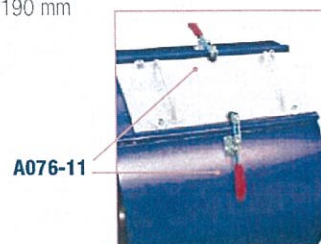
**A075N + A075-12****UPGRADING ACCESSORIES****A075-11**

SECURITY CABINET, manufactured from sheet steel, conforming to CE Safety Directive.

When opening the cabinet door during Los Angeles working, a microswitch automatically stops the rotation of the drum.

**Dimensions:** 980x1070x1190 mm

**Weight:** 150 kg approx.

**A076-01****A076-11****A075-12**

SECURITY CABINET, manufactured from sheet steel, internally lined with sound-proofing material for noise reduction, conforming to CE Safety Directive.

When opening the cabinet's door during Los Angeles working, a microswitch automatically stops the rotation of the drum.

**Dimensions:** 980x1070x1190 mm

**Weight:** 160 kg approx.

**A076-11**

DEVICE for an easy and fast clamping of the table to the drum





## TEST SIEVES

STANDARDS: EN 933-2 | ISO 3310-1, ISO 3310-2, ISO 565 | ASTM E 11 | BS410 | NF X11-504 | UNI 2331, UNI 2333 | DIN 4187-1 | UNE 7050

All sieves are made with stainless steel woven wire and frame and meet International Specifications.

Perforated plates are made of tinned steel, both square and round holes.

The sieves are available in the following diameters: 200 - 250 - 300 - 315 - 400 - 450 mm and 8"-12".

Their apertures are clearly marked on the label, including the serial number for the identification and traceability of the sieve.

Each sieve is supplied complete with certificate of conformity.

### HOW TO BUY WOVEN WIRE MESH SIEVES

STANDARDS: ISO 3310-1 | EN 933-2, | BS410 | UNE 7050  
DIN 4187-1 | NF X11-504 | UNI 2331, 2333  
ASTM E11

The available openings of the woven wire mesh sieves are listed in the next pages and are coded from n° 00 to 77.

The buyer has to add to this number:

- A052-...** for the frame Ø 200 mm
- A051-...** for the frame Ø 250 mm
- A053-...** for the frame Ø 300 mm
- A054-...** for the frame Ø 315 mm
- A055-...** for the frame Ø 400 mm
- A050-...** for the frame Ø 8"
- A043-...** for the frame Ø 12"



**A052-...**

**Note:** It is possible to test approx. 1000 g of material by using Ø 200 mm sieves; and 3000 g with Ø 300 mm sieves.

### HOW TO BUY PERFORATED PLATE SIEVES

#### "Square Hole"

STANDARDS: EN 933-2 | ISO 3310-2 | BS 410 | DIN 4187-1

The available openings of the perforated plate square hole sieves are listed in the next page, and are coded from n° 01 to 37

The buyer has to add to this number:

- A031-...** for the frame Ø 200 mm
- A032-...** for the frame Ø 300 mm
- A033-...** for the frame Ø 400 mm



**A031-...**

**Note:** EN 933-2 Standard specifies that "sieves with opening 4 mm and over shall be perforated plate square hole". Below 4 mm they shall be woven wire.

### HOW TO BUY PERFORATED PLATE SIEVES

#### "Round Hole"

STANDARDS: UNI 2334

The available openings of the perforated plate round hole sieves are listed in the next page, and are coded from n° 01 to 38

The buyer has to add to this number:

- A037-...** for the frame Ø 200 mm
- A038-...** for the frame Ø 300 mm



**A037-...**





TABLE OF THE PERFORATED PLATE SIEVES, "SQUARE HOLES"

STANDARDS: ISO 3310-2 | EN 933-2 | BS 410 | DIN 4187-1

Aperture mm	Frame Ø 200 mm	Frame Ø 300 mm
4.00	A031-01	A032-01
4.75	A031-02	A032-02
5.00	A031-03	A032-03
5.60	A031-04	A032-04
6.30	A031-05	A032-05
6.70	A031-06	A032-06
7.10	A031-07	A032-07
8.00	A031-08	A032-08
9.00	A031-34	A032-34
9.50	A031-09	A032-09
10.00	A031-10	A032-10
11.20	A031-11	A032-11
12.50	A031-12	A032-12
13.20	A031-13	A032-13
14.00	A031-14	A032-14
16.00	A031-15	A032-15
18.00	A031-35	A032-35
19.00	A031-16	A032-16
20.00	A031-17	A032-17
22.40	A031-18	A032-18
25.00	A031-19	A032-19
26.50	A031-20	A032-20
28.00	A031-21	A032-21
31.50	A031-22	A032-22
37.50	A031-23	A032-23
40.00	A031-33	A032-33
45.00	A031-24	A032-24
50.00	A031-25	A032-25
53.00	A031-26	A032-26
56.00	A031-36	A032-36
63.00	A031-27	A032-27
75.00	A031-28	A032-28
80.00	A031-37	A032-37
90.00	A031-29	A032-29
100.00	A031-30	A032-30
106.00	A031-31	A032-31
125.00	A031-32	A032-32

TABLE OF THE PERFORATED PLATE SIEVES, "ROUND HOLES"

STANDARD: UNI 2334

Aperture mm	Frame Ø 200 mm	Frame Ø 300 mm
4.00	A037-01	A038-01
4.75	A037-02	A038-02
5.00	A037-03	A038-03
5.60	A037-04	A038-04
6.30	A037-05	A038-05
7.10	A037-06	A038-06
8.00	A037-07	A038-07
9.00	A037-08	A038-08
10.00	A037-09	A038-09
11.20	A037-10	A038-10
12.50	A037-11	A038-11
13.20	A037-12	A038-12
14.00	A037-13	A038-13
15.00	A037-37	A038-37
16.00	A037-14	A038-14
18.00	A037-15	A038-15
19.00	A037-16	A038-16
20.00	A037-17	A038-17
25.00	A037-18	A038-18
28.00	A037-19	A038-19
30.00	A037-38	A038-38
31.50	A037-20	A038-20
35.50	A037-21	A038-21
40.00	A037-22	A038-22
45.00	A037-23	A038-23
50.00	A037-24	A038-24
53.00	A037-25	A038-25
56.00	A037-26	A038-26
63.00	A037-27	A038-27
71.00	A037-28	A038-28
75.00	A037-29	A038-29
80.00	A037-30	A038-30
90.00	A037-31	A038-31
100.00	A037-32	A038-32
106.00	A037-33	A038-33
112.00	A037-34	A038-34
125.00	A037-35	A038-35





### A104N ULTRASONIC CLEANSING BATH 10 LITRES

Used for a safe and valid cleaning of sieves and glassware, which could be damaged by ordinary cleaning methods. It is particularly suitable for fine mesh sieves. The bath accepts sieves up to 200 mm and 8" diameter. Supplied complete with timer 0 - 99 minutes. Internal diameter: 260 mm, height 200 mm. Stainless steel made, with incorporated electronic generator, frequency 35 KHz. Complete with lid and discharge cock.

**Capacity:** 7 litres

**Power supply:** 230V 50-60Hz 1ph 200W

**Dimensions:** 274x370 mm

**Weight:** 8 kg approx.



A104-01N

### A104-01N ULTRASONIC CLEANSING BATH 25 LITRES

Similar to mod. A104N but with inside dimensions: Ø 410x200 mm. Ultrasonic frequency adjustable from 28 KHz to 40 KHz. Water heating system, adjustable from ambient to +80 °C. It accepts sieves up to 350 mm diameter.

**Capacity:** 25 litres

**Power supply:** 230V 50-60Hz 1ph 1700W

**Dimensions:** 510x510x450 mm

**Weight:** 35 kg approx.

#### ACCESSORY

**A104-02** CLEANSING LIQUID for ultrasonic bath, 25 litre can.

**A104-03** CLEANSING LIQUID for ultrasonic bath, 5 litre can.



A104N

### A071-10 VOID CONTENT OF FINE AGGREGATE

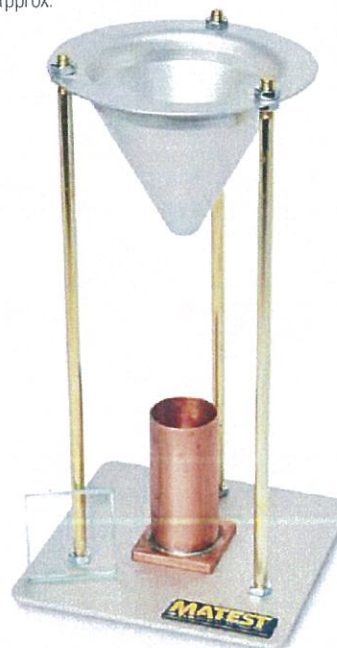
STANDARDS: ASTM C1252 | AASHTO TP33



Used to determine the uncompacted void content of a fine aggregate sample. Indicates the angularity, sphericity, and workability of fine aggregate in a mixture. Supplied complete.

**Dimensions:** 205x205x690 mm

**Weight:** 2 kg approx.



A071-10







A059-03 KIT



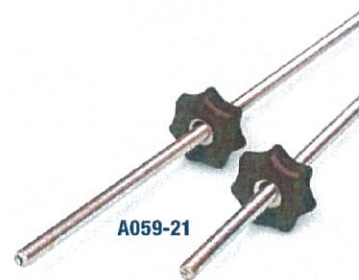
A059-04 KIT

### A058 NOISE REDUCTION CABINET

For the sieve shakers A059 serie and A060-01, lined internally with sound-proofing material for noise reduction in compliance with CE Directive.



A058 + A059-03 KIT

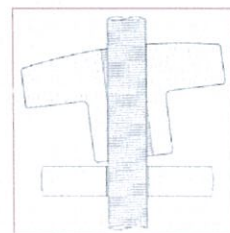


A059-21

### ACCESSORY

#### A059-21

KNOBS for fast clamping/release of the upper beam.  
Useful for fast vertical displacement of the beam.  
(Not usable with A059-01 KIT model)  
Pack of 2 knobs with rods.



A059-21





**C322****UNIVERSAL ELECTRIC CORE DRILLING MACHINE**

Coring angle: 0 to 360°

The excursion group is rectified to assure a very soft and accurate drilling movement. The excursion is 550 mm.

Electric motor at three speeds: 670, 1140, 1580 rpm with speed reducer, provided of friction device and switch to CE Safety Directive. The height of the vertical column is 1000 mm and is pre-built for extension column connection (accessory mod. C322-01).

**Power supply:** 230V 1ph 50-60Hz 2200W

**Dimensions:** 440x750x1300 mm

**Weight:** 85 kg approx.

**C322****ACCESSORY**

**C322-01** EXTENSION COLUMN, 1000 mm long, to connect to mod. C322 for drillings over 1 metre from the ground.

**DIAMOND CORE DRILL BITS****WITH BACKEND SCREWED CONNECTOR**

Designed for making holes and getting cores from hard materials, like concrete, reinforced concrete, rocks, stones, bituminous materials. The diamond utilized for these bits is quality impregnated sinterized type.

The diamond segment is **9 mm high**. The 9 mm high segment is important for the bit life, because the diamond is about 85% of the bit value.

The coupling between the bit and the motor shaft is direct through the backend screwed connector.

This diamond bit model is suitable to drill both reinforced concrete and also bituminous materials.

**Note:**

Matest can also provide high-performance diamond core drill bits having the same diameter (models with a HP code) but with a quantity of diamonds greater than 50%, to guarantee even faster and more precise drilling, as well as a longer life.

- C344** Strap wrench useful for unblocking any type of bit.  
**C344-01** Strap wrench useful for unblocking only the bits with backend screwed connector.  
**C345** Extension rod 300 mm. long (used for deep holes).

**C339-01...C339-05**

Model	HP Model	Outside Ø mm	Inside Ø mm	Bit length mm	Expander Coupling	Core Extractor
C339-01	C339-01 HP	57	50	450	no	C346
C339-02	C339-02 HP	82	75	450	no	C346-01
C339-03	C339-03 HP	108	100	450	no	C346-02
C339-04	C339-04 HP	160	152	450	no	C346-03
C339-05	C339-05 HP	210	200	500	no	C346-04

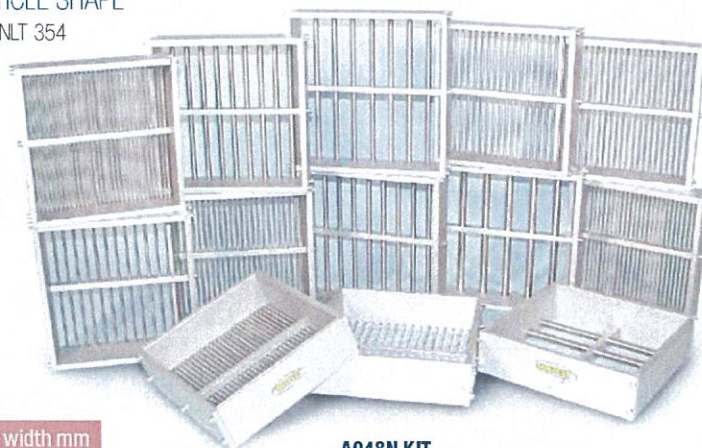
**MATEST**



**BAR (GRID) SIEVES****FOR AGGREGATE FLAKINESS INDEX AND PARTICLE SHAPE**

STANDARDS: EN 933-3 | UNI 8520-18 | NF P18-561 | NLT 354

The frame is anodized aluminium made and the grids are **stainless steel rod bars having diameter from 5 to 15 mm** according to the slot widths. Sieve sizes, slot width tolerances and rod bars diameter are checked one by one, and meet EN 933-3 Standard. Each sieve is supplied complete with identification serial number label.

**Sieve dimensions:** 275x275x475 mm**Weight:** 2 kg each sieve.**A048N KIT**

Model	Slot width mm	Model	Slot width mm
A048-01	2.50	A048-08	12.50
A048-02	3.15	A048-09	16.00
A048-03	4.00	A048-10	20.00
A048-04	5.00	A048-11	25.00
A048-05	6.30	A048-12	31.50
A048-06	8.00	A048-13	40.00
A048-07	10.00	A048-17	50.00

**A048N KIT** COMPLETE SET of 14 bar sieves from 2.5 (A048-01) to 50 mm (A048-17) slot width.

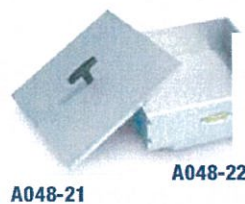
**A048-14** BAR GRID SIEVE, slot width 9.5 mm. Used to check the wear of the spheres of the Micro-Deval having nominal size 10 mm.

**ACCESSORIES for BAR (GRID) SIEVES**

**A048-20** KIT OF TWO DEVICES, anodized aluminium made, complete with stainless steel screws, to fix one bar sieve over another one, in order to get a cascade to be fitted on mechanical sieve shakers.

**A048-21** COVER for Bar Sieves, anodized aluminium made.

**A048-22** RECEIVER for Bar Sieves, anodized aluminium made, complete with coupling device to be fixed to the Matest shakers mod. A059-02 KIT | A059-03 KIT | A059-04 KIT A060-01

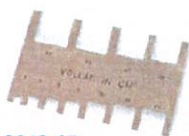
**A048-21****A048-22**

**A048-15**  
**GAUGE FOR AGGREGATE FLATNESS INDEX**

STANDARD: UNI 8520 part. 18

Used to determine the volume of each circumscribed sphere.

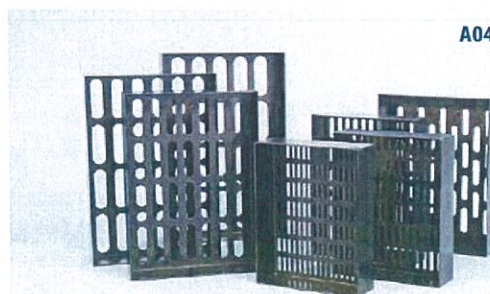
Made of heavy brass sheet.

**A048-15****FLAKINESS SIEVES**

STANDARD: BS 812:105.1

Used to determine if aggregate is flaky; i.e. if thickness is less than 0.6 of nominal size. Manufactured from heavy steel sheet, they have dimensions as specified by Standards and are available in the following size openings:

Model	Slot width mm	Slot length mm
A049-01	4.9	30
A049-02	7.2	40
A049-03	10.2	50
A049-04	14.4	60
A049-05	19.7	80
A049-06	26.3	90
A049-07	33.9	100

**A049 KIT****A049 KIT**

COMPLETE SET of n°7 flakiness sieves.

**Weight:** 15 kg approx.