

# Section A

## AGGREGATES - ROCKS

section A



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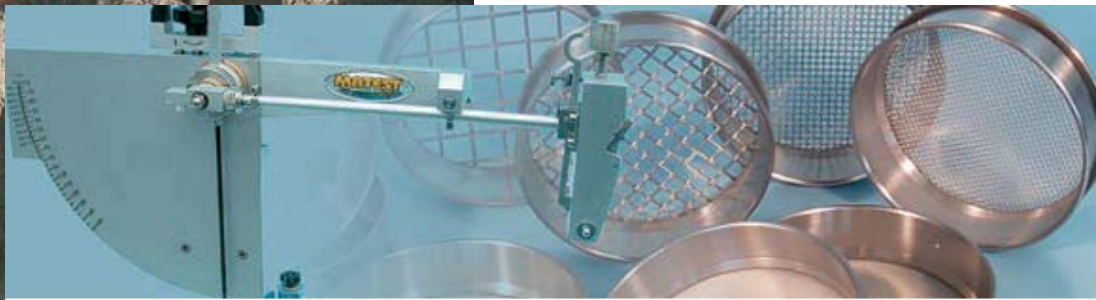


Aggregates represent the mainly used product in the building industry; they are used in concrete, bituminous conglomerates, plasters, road and railways subgrades... etc.

The different International Standards together with the EN European Standards are requiring many different checks on different features as: mechanical, physical, geometrical, kind of density, strength, degradability, etc.

A rock stratum will undergo alterations in the mechanical characteristics when it is exposed to excavations, handlings etc.

For above reasons a study of the mechanical characteristics of an intact rock becomes indispensable in order to analyse the relative characteristics when realising underground or surface structures as galleries, quarries and foundations.



**MATTEST**

**LABORATORY DRYING OVENS**

Two versions available:

- **Natural convection for general purposes**
- **Forced ventilation for a more uniform temperature with on/off switch of the fan**



Designed for drying, baking, conditioning and moisture determination.

Sturdy manufacture, double walled with 60 mm thick glass fibre for thermal insulation.

Exterior front part is stainless steel made; while interior chamber, grid shelves and external walls are made from zinc coated steel.

Temperature from ambient to 200°C. is controlled by a “digital thermoregulator-indicator”. The ovens are equipped of a “dual safety thermostat” with higher thermic threshold to prevent accidental over-temperatures, and to ensure safe working conditions.

The oven is supplied complete with two grid shelves easily removable and that can be positioned at various heights, pilot light, exhaust holes for fast cooling.

Power supply: 230V 50-60Hz 1ph



A007-01 KIT + A006-08

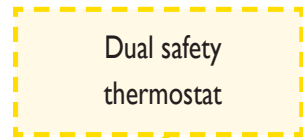
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Natural convection Model	Capacity litres	NEW Forced ventilation Model	Inside dimensions mm			Outside dimensions mm			Doors n°	Wattage	Weight kg	Spare grid shelf
			L	D	H	L	D	H				
<b>A007</b>	50	"	350	360	390	590	460	620	1	750	34	<b>A006-01</b>
<b>A007-01 KIT</b>	100	<b>A005-01 KIT</b>	400	420	600	640	515	805	1	1200	40	<b>A007-51</b>
<b>A007-04 KIT</b>	220	<b>A005-04 KIT</b>	600	610	600	840	725	805	1	2000	60	<b>A007-52</b>
<b>A007-08 KIT</b>	440	<b>A005-08 KIT</b>	900	700	700	1140	760	910	2	3600	85	<b>A007-53</b>



A005-04 KIT Detail of the fan



A005-04 KIT



A007-08 KIT + A006-08

ACCESSORY:

**A006-08** Mercury control thermometer 0-300°C., div. 1°C.

**LABORATORY OVENS, FORCED VENTILATION, DIGITAL THERMOSTAT. HIGH TEMPERATURE UNIFORMITY AND PRECISION**

STANDARDS: EN 932-5 / EN 1097-5 / ASTM C127, C136, D558, D559, D560, D698, D1557, D1559 / BS 1377 :1, 1924 :1 / UNE 103300

Especially suitable where high temperature uniformity and precision inside the chamber are required.

The accuracy of the temperature and its uniformity are granted within the tolerances requested by the Standards.

The interior chamber, the grid shelves and the exterior front part are stainless steel made; while external walls are made from zinc coated steel.

Sturdy manufacture, double walled with 60 mm thick glass fibre for thermal insulation.

Temperature from ambient to 200°C. is controlled by a digital precision thermoregulator-indicator. The oven is equipped of a dual safety thermostat with higher thermic threshold to prevent accidental over-temperatures, and to ensure safe working conditions.

The oven is supplied complete with two grid shelves easily removable and that can be positioned at various heights, pilot light, exhaust holes for fast cooling.

Power supply: 230V 50-60Hz 1 ph



A008-07 KIT

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Model	Capacity litres	Inside dimensions mm			Outside dimensions mm			Doors n°	Wattage	Weight kg	Spare grid shelf stainless steel
		L	D	H	L	D	H				
<b>A008-01 KIT</b>	100	400	420	600	700	515	910	1	1250	45	<b>A008-51</b>
<b>A008-03 KIT</b>	220	600	610	600	900	725	910	1	2050	70	<b>A008-52</b>
<b>A008-05 KIT</b>	440	900	700	700	1250	760	1000	2	3700	95	<b>A008-53</b>
<b>A008-07 KIT</b>	750	900	640	1300	1250	700	1600	2	4950	140	<b>A008-54</b>



A008-07 KIT

- Forced ventilation airflow
- Digital temperature control system
- Temperature precision and uniformity as requested by EN, BS Spec.
- Stainless steel chamber and trays
- Insulation by 60 mm thick glass fibres
- Dual thermostat ensuring safe working conditions

ACCESSORY:

**A006-08** Mercury control thermometer 0-300°C., div. 1°C.

**MATTEST**

## A022N

### Muffle furnace 1100°C.

STANDARDS: EN 12697-1 clause C, EN 13108

Designed for high temperature heatings.

Structure made in sheet-steel, furnace frontal in diecasted steel to avoid the aggreation of the acid smokes. The thermic insulation is in ceramic fibre to avoid the smallest heating leakage and so it takes a great energetic saving. Electronic visualized regulation of the temperature obtained by a digital thermostat. This furnace is also used for the determination of residual of mineral matter by incineration of bituminous mixtures to EN 12697-1 clause C Standard.

Max. temperature: 1100° C.

Room stability: ± 1° C.

Room uniformity: ± 10° C.

Inside dimensions: 220x300x133 mm

Outside dimensions: 440x620x510 mm

Power supply: 230V 1ph 50-60Hz 1,8KW

Weight: 70 kg approx.



A022N

## A023-01

### Muffle Furnace 1100°C. high capacity

Floor mounting furnace, the heating body is composed by 4 panels containing independent radiant resistors.

Thermal insulation realized by microporous refractories in layers with progressive density.

Automatic regulation given by an electronic visualized pyrometer double intervention with 0-24 hours timer

Max. temperature: 1100°C.

This furnace is also suitable for the "Determination of resistance to thermal shock of aggregates according to EN 1367-5 Specification".

Inside dimensions (wxdxh): 300x500x220 mm

Overall dimensions: 750x1100x1650 mm

Power supply: 400V 3ph 50/60Hz 9Kw

Weight: 400 kg

ACCESSORY for Muffle Furnaces:

**A023-11** Temperature programmer.



A023-01

## A024

### Muffle furnace 1200°C.

STANDARDS: EN 196-2, 196-21, 459-2

Used to determine the loss on ignition of cement and lime; chloride, carbon dioxide, alkali content of cement.

Max. temperature: 1200°C.

The heat insulation is made of ceramic fibre.

Heating muffle, unthreaded from the back, in an only cast of refractory.

Lateral opening door with pressure wedge and with a stop device for electric feeding when it opens.

Control panel is positioned on the furnace bottom containing a digital visualized thermoregulator and magnetic thermic for protection system.

Inside dimensions (wxdxh): 145 x250x100 mm

Overall dimensions: 500x650x650 mm

Power supply: 230V 1ph 50/60Hz 4200W

Weight: 70 kg



A024



**Chloride content, Rapid Method**

STANDARDS: BS 812:117 / BS 1377:3

Used to estimate the chloride content of aqueous solutions in sand and fine aggregates.

**A019-01 Quantab** Chloride Titrator Strips, type 1175, range 0,005% to 0,1% (30 to 600 ppm) Na Cl. Pack fo 40 strips.

**A019-02 Quantab** Chloride Titrator Strips, type 1176, range 0,05% to 1% (300 to 6000 ppm) Na Cl. Pack of 40 strips.

**Sulphate Content, Rapid Method:**

STANDARD: BS 1377:3

Used to determine the sulphate ions in aqueous solutions of sand and fine aggregates.

**A019-03**

**Sulphate Test Strips**, detection range 200 to 1600 mg/l. Pack of 100 strips.



**Hot plates**, complete with thermoregulator

Power supply: 230V 1ph 50/60 Hz

MODELS:

**V200** Round dia. 185 mm - 1500 W

**V200-02** Round dia. 220 mm - 2000 W

**B074** Round dia. 160 mm - 1000 W

**NEW V200-01N** Rectangular 200x300 mm - 1500 W

**V200-03N** Square 380x380 mm - 2000 W

**V200-05N** Rectangular 400x500 mm - 2000 W

**V200-06N** Rectangular 400x600 mm - 2000 W



**B073-01**

**Magnetic stirrer/heater** for titration and stirring of liquid and semi-solid materials. Plate dia. 150 mm. Variable speed and temperature by electronic regulators. Supplied complete with magnetic teflon coated follower. Power supply: 230V 1 ph 50 Hz 400 W



**A009**

**Microwave oven**

Used for speed drying purposes, moisture determination, conditioning. Power supply: 230V 50 Hz 1ph 700W Weight: 12 kg approx



A009

**A106**

**Melting pot**

Used to melt wax and other materials, it maintains heat from room temperature to max. 350°C.

Complete with adjustable thermostat range +50° C. to +350° C., accuracy ± 1,5° C., pilot lamp fully isolated to CE requirements. Capacity: 5 litres

Internal dimensions:

Ø 200x160 mm.

Power supply:

230V 50/60 Hz 1ph 800W

Weight: 3 kg



A106

ACCESSORY:

**V300-19**

**PARAFFIN WAX**, for general laboratory use, having melting point at 50-54°C. Pack of 5 kg

**V201**

**Warm air drier**, for general laboratory purposes, to dry soil and aggregate samples.

Power supply:

230V 1 ph 50 Hz 1200 W



V201

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**A028**

**Universal carbide meter**

STANDARDS: BS 6576 / AASHTO T217 / ASTM D4944 / UNE 7804  
 For the rapid and accurate determination of moisture content in sand, gravel, aggregates, soil etc, based on the calcium carbide method. It is possible to vary the sample weight from 3 to 100 g achieving a moisture range from 50% (3g) - 7,5% (20g) - 1,5% (100g). The bottle is calibrated and equipped with a surface thermometer. The glass ampoule containing the calcium carbide is broken when the bottle is closed and shaken, granting better accuracy to the test. The instrument comprises the testing bottle with manometer, small balance, 25 ampoules of reagent, accessories, case. Dimensions: 520x340x140 mm. Weight: 6 kg approx.



**A028 SP**

**Universal carbide meter**

Same to mod.A028, but with a larger bottle to be able to use 20 g sample weight with a moisture content up to 25%.

**A028-01**

**Digital universal carbide meter**

Same to mod.A028, but with digital manometer for more accurate readings with pressure and temperature display. Supplied complete.



**A028-02**

**Digital universal carbide meter**

Same to mod.A028-01, with protocol printer to obtain test certificate with up to 7 pressure / time logs. Weight: 8 kg

SPARE-PART:

**A028-11**

Carbide Ampoules (pack of 100)



**“Speedy” Moisture Testers**

STANDARDS: ASTM D4944 / AASHTO T217 / UNE 7804 / BS 6576  
 For accurate moisture reading on site of soil, sand, aggregates. The test system arrives by the reaction between water and calcium carbide forming a gas. Complete with electronic balance, reagent tin, accessories; the whole contained in a portable moulded case.

MODELS:

**A025 KIT** SPEEDY Moisture tester 6 grams capacity.

Moisture range: 0 - 20%

Weight: 6 kg



A025 KIT

**A026 KIT** SPEEDY Moisture tester 20 grams capacity.

Moisture range: 0 - 20%

Weight: 8 kg

SPARE PART:

**A027-01**

Moisture tester reagent (one-pound tin)

ACCESSORY:

**A027-11**

Speedy calibration kit



A026 KIT

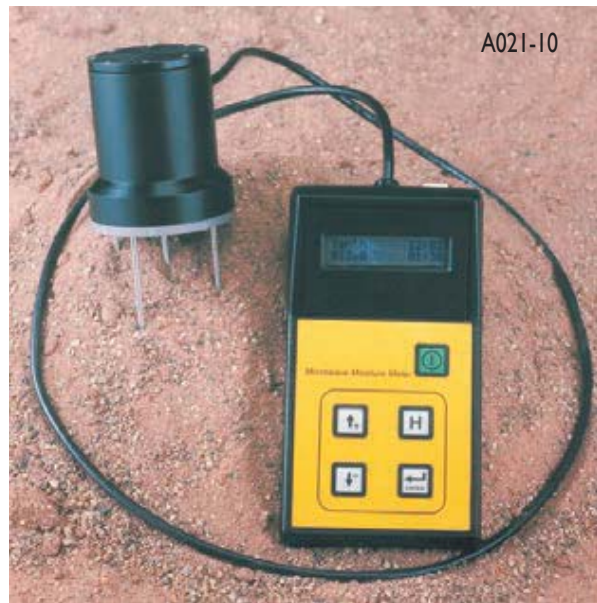


A028-01

**A021-10**

**Moisture, digital microwave portable meter**

For accurate, fast and easy determination of moisture content in sand, fine and coarse aggregates up to 25 mm diameter. By utilizing the latest microwave and microprocessor technology, and simply insert the 5 prongs into the material to be measured, the unit display the percentage of moisture content. Measuring range: 0 - 20% with +/- 0,2% accuracy. Frequency: 50 Mhz; RS232 data link; over 150 readings storage. Power: 4 AA batteries  
Weight: 1800 g



A021-10

**A021**

**Moisture meter “Microlance”**

This electronic tester measures and visualizes directly on the display the moisture percentage and temperature of sand and fine aggregates up to max. dia. of 10 mm by simply inserting the crucible tip. Suitable for both site and laboratory tests. Moisture range: 0-35%, accuracy 0,5%  
Measuring deep: 1000 mm  
Temperature range: -20°C. to +60°C. accuracy 0,5°C.  
Battery: 4x1.5V AA cells  
Dimensions: 120x120x1200 mm. Weight: 2 kg

**A021-01**

**Moisture meter “Microlance”**

Similar to mod. A021, but with measuring deep up to 2000 mm  
Dimensions: 120x120x2200 mm  
Weight: 3 kg



A021

A021 detail

**Desiccators borosilicate glass**

Complete with perforated porcelain plate.

without vacuum		with vacuum	
<b>A035</b>	Dia. 200 mm	<b>A039</b>	Dia. 200 mm
<b>A036</b>	Dia. 250 mm	<b>A040</b>	Dia. 250 mm
<b>A036-01</b>	Dia. 300 mm	<b>A040-01</b>	Dia. 300 mm

ACCESSORY:

**V300-15 Desiccators salts** Silica gel box 1000 g

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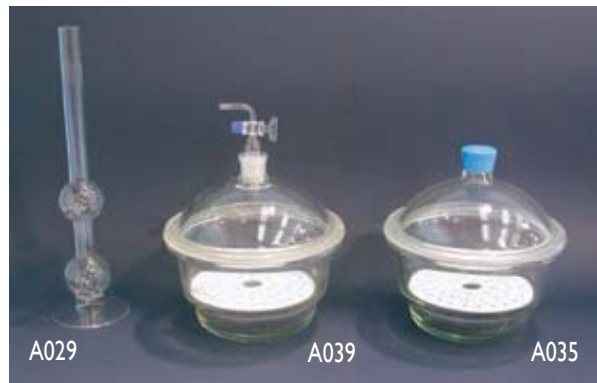
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**A029**

**Chapman flask**

STANDARDS: ASTM C70 / AASHTO T142

Used for field determination of the amount of surface moisture in fine aggregates. Graduated to 200 ml between the two bulbs and from 375 up to 450 ml above the second bulb. Weight: 500 g



A029

A039

A035

**A030**

**Reaction container**

STANDARDS: ASTM C289 / NF P94-048 / UNI 8520-22  
UNE 146507-1

Used for the chemical determination of the potential reactivity of aggregates with alkalis in portland cement concrete. Manufactured from stainless steel and fitted with an air-tight cover. Capacity 60 ml approx.  
Weight: 2 kg



ASSEMBLED

A030

DISASSEMBLED



V023-01

**V023-01**

**Moisture determination balance**

See section “V” General Equipment pag. 469

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 from "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.

Weight: 4 kg each sieve.



A048N KIT

**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.

### Flakiness sieves

STANDARD: BS 812

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
<b>A049-01</b>	4,9	30
<b>A049-02</b>	7,2	40
<b>A049-03</b>	10,2	50
<b>A049-04</b>	14,4	60
<b>A049-05</b>	19,7	80
<b>A049-06</b>	26,3	90
<b>A049-07</b>	33,9	100

**A049 KIT**  
Complete set of n°7 flakiness sieves.  
Weight: 15 kg



A049 KIT

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Model	Slot width mm
<b>A048-01</b>	2,50
<b>A048-02</b>	3,15
<b>A048-03</b>	4,00
<b>A048-04</b>	5,00
<b>A048-05</b>	6,30
<b>A048-06</b>	8,00
<b>A048-07</b>	10,00

Model	Slot width mm
<b>A048-08</b>	12,50
<b>A048-09</b>	16,00
<b>A048-10</b>	20,00
<b>A048-11</b>	25,00
<b>A048-12</b>	31,50
<b>A048-13</b>	40,00
<b>A048-17</b>	50,00

NEW

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 and 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 / A059-03 / A059-04 / A060-01

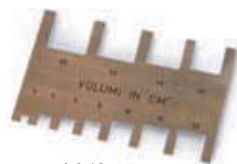


**A048-15**  
**Gauge** for aggregate Flatness index

STANDARD: UNI 8520 part. 18

Used to determine the volume of each circumscribed sphere.

Made in heavy brass sheet.



A048-15

MATEST



**Test sieves**

STANDARDS: **EN 933-1, EN 933-2** / ISO 3310-1, ISO 3310-2, ISO 565 / ASTM E 11 / AASTHOT27 / BS410  
UNI 2331, UNI 2333 / DIN 4187-1 / UNE 7050

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

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

The sieve aperture is clearly marked on the metallic label, comprising 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 933-1, 933-2**, / BS410  
UNE 7050 / DIN 4187-1  
UNI 2331, 2333 / ASTM E 11

The available openings of the woven wire mesh sieves are listed in the next pages and are coded from n° 01 to 77.

The buyer has to add to this number:

- A052-...** for the frame dia. 200 mm
- A051-...** for the frame dia. 250 mm
- A053-...** for the frame dia. 300 mm
- A054-...** for the frame dia. 315 mm
- A055-...** for the frame dia. 400 mm
- A044-...** for the frame dia. 450 mm
- A050-...** for the frame dia. 8"
- A043-...** for the frame dia. 12"

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 dia. 200 mm
- A032-...** for the frame dia. 300 mm
- A033-...** for the frame dia. 400 mm
- A034-...** for the frame dia. 450 mm



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



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"

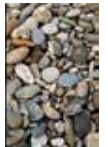
STANDARD: UNI 2334

The available openings of the perforated plate round hole sieves are listed in the next page, and are coded from n° 01 to 40

The buyer has to add to this number:

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

**A041** "UKAS" certificate for "MASTER" Sieves.  
All Sieves can be supplied with UKAS certificate so to be classified "MASTER SIEVE".



**Table for the woven wire mesh sieves.**

STANDARDS: EN 933-1, EN 933-2 / ISO 3310-1 / ASTM E11 / UNI 2331, UNI 2333 / UNE 7050 / BS 410 / DIN 4187-1

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Aperture Size mm	ASTM Number	Frame Dia. 200 mm	Frame Dia. 300 mm	Aperture Size mm	ASTM Number	Frame Dia. 200 mm	Frame Dia. 300 mm
0,025	-	A052-00	A053-00	2,800	7	A052-40	A053-40
0,038	400	A052-01	A053-01	3,150	-	A052-41	A053-41
0,040	-	A052-02	A053-02	3,350	6	A052-42	A053-42
0,045	325	A052-03	A053-03	4,000	5	A052-43	A053-43
0,050	-	A052-04	A053-04	4,750	4	A052-44	A053-44
0,053	270	A052-05	A053-05	5,000	-	A052-45	A053-45
0,063	230	A052-06	A053-06	5,600	3,5	A052-46	A053-46
0,075	200	A052-07	A053-07	6,300	1-4"	A052-47	A053-47
0,080	-	A052-08	A053-08	6,700	0,265"	A052-48	A053-48
0,090	170	A052-09	A053-09	7,100	-	A052-49	A053-49
0,100	-	A052-10	A053-10	8,000	5-16"	A052-50	A053-50
0,106	140	A052-11	A053-11	9,500	3-8"	A052-51	A053-51
0,125	120	A052-12	A053-12	10,0	-	A052-52	A053-52
0,150	100	A052-13	A053-13	11,2	7-16"	A052-53	A053-53
0,160	-	A052-14	A053-14	12,5	1-2"	A052-54	A053-54
0,180	80	A052-15	A053-15	13,2	0,530"	A052-55	A053-55
0,200	-	A052-16	A053-16	14,0	-	A052-56	A053-56
0,212	70	A052-17	A053-17	16,0	5-8"	A052-57	A053-57
0,250	60	A052-18	A053-18	19,0	3-4"	A052-58	A053-58
0,300	50	A052-19	A053-19	20,0	-	A052-59	A053-59
0,315	-	A052-20	A053-20	22,4	7-8"	A052-60	A053-60
0,355	45	A052-22	A053-22	25,0	-	A052-61	A053-61
0,400	-	A052-23	A053-23	25,4	1"	A052-62	A053-62
0,425	40	A052-24	A053-24	26,5	1,06"	A052-63	A053-63
0,500	35	A052-25	A053-25	28,0	-	A052-64	A053-64
0,600	30	A052-26	A053-26	31,5	1 1-4"	A052-65	A053-65
0,630	-	A052-27	A053-27	37,5	1 1-2"	A052-66	A053-66
0,710	25	A052-28	A053-28	40,0	-	A052-67	A053-67
0,800	-	A052-29	A053-29	45,0	1 3-4"	A052-68	A053-68
0,850	20	A052-30	A053-30	50,0	2"	A052-69	A053-69
1,000	18	A052-31	A053-31	53,0	2,12"	A052-70	A053-70
1,180	16	A052-32	A053-32	56,0	-	A052-70S	A053-70S
1,250	-	A052-33	A053-33	63,0	2 1-2"	A052-71	A053-71
1,400	14	A052-34	A053-34	75,0	3"	A052-72	A053-72
1,600	-	A052-35	A053-35	80,0	-	A052-73	A053-73
1,700	12	A052-36	A053-36	90,0	3 1-2"	A052-74	A053-74
2,000	10	A052-37	A053-37	100,0	4"	A052-75	A053-75
2,360	8	A052-38	A053-38	106,0	4,24"	A052-76	A053-76
2,500	-	A052-39	A053-39	125,0	5"	A052-77	A053-77

**Table of the perforated plate sieves,  
“square holes”**

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

**Table of the perforated plate sieves,  
“round holes”**

STANDARD: UNI 2334

Aperture mm	Frame Dia. 200 mm	Frame Dia. 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

Aperture mm	Frame Dia. 200 mm	Frame Dia. 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

section A



## Wet washing sieves

STANDARD: ASTM E 11

Used for wet testing of fine granulated materials.  
Frame and woven wire cloth are stainless steel made.  
Frame dimensions: Dia. 200 mm by 100 or 200 mm height.

MODELS:

- A045** Cloth opening 0,074 mm by 200 mm height
- A045-02** Cloth opening 0,063 mm by 200 mm height
- A045-05** Cloth opening 0,074 mm by 100 mm height
- A045-06** Cloth opening 0,063 mm by 100 mm height



A046

A046-11

## Wet sieving pan+lid stainless steel

The water enters through the spray nozzle mounted on top of the lid and comes out with fines from the pan. Supplied complete with two watertight seals.

Model	Set of 10 watertight seals
<b>A046</b> Pan + Lid, dia. 200 mm	<b>A046-11</b>
<b>A046-02</b> Pan + Lid, dia. 8"	<b>A046-11</b>
<b>A047</b> Pan + Lid, dia. 300 mm	<b>A047-11</b>
<b>A047-02</b> Pan + Lid, dia. 400 mm	<b>A047-12</b>

section A



A045

A045-02

36

- VI79** Bristle Brush, soft hair, 35 mm dia.
- VI79-02** Double ended, brass and nylon bristle
- VI79-03** Double ended soft/hard nylon
- VI79-05** Soft hair Brush, 3 mm dia. BS 812
- VI79-06** Hard nylon sieve Brush, flat 60 mm



VI79

VI79-3

VI79-02

VI79-06

VI79-5



A056

A057

	Dia 200 mm	Dia 300 mm	Dia 250 mm	Dia 315 mm	Dia 8"	Dia 450 mm	Dia 400 mm	Dia 12"
LID	<b>A056</b>	<b>A056-01</b>	<b>A056-02</b>	<b>A056-03</b>	<b>A056-04</b>	<b>A056-05</b>	<b>A056-06</b>	<b>A056-07</b>
RECEIVER	<b>A057</b>	<b>A057-01</b>	<b>A057-02</b>	<b>A057-03</b>	<b>A057-04</b>	<b>A057-05</b>	<b>A057-06</b>	<b>A057-07</b>

## A104N Ultrasonic cleansing bath

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  
Capacity: 10 litres  
Stainless steel made, with incorporated electronic generator, frequency 35 KHz.  
Supplied complete with lid and discharge cock.  
Power supply: 230V 50/60 Hz 1ph 200W  
Dimensions: dia. 274 x 370 mm  
Weight. 8 kg approx.



A104N

## A104-01 Ultrasonic cleansing bath

Similar to mod. A104N but with inside dimensions:  
dia. 410xh 200 mm.  
It accept sieves up to 350 mm diameter.  
Capacity: 25 litres  
Power supply: 230V 50/60 Hz 1ph 600W  
Weight: 16 kg

ACCESSORY:

- A104-02** CLEANSING LIQUID for ultrasonic bath, 25 litre can.
- A104-03** CLEANSING LIQUID for ultrasonic bath, 5 litre can.

MATEST

**A058-05N**

**Air Jet Sieving Machine**

STANDARD: EN 933-10

The Air Jet Machine is suitable for sieving powder and dry grain products by obtaining sieving results between 5 to 4000 microns, by using appropriate test sieves 200 mm dia. Its working foundation is based on the use of air that tug thin particles to make them go through the sieve.

This effect is made through a vacuum machine that provokes a controlled decrease of pressure. This vacuum machine is equipped with an automatic cleaning system of the filter cartridge allowing to perform many tests (some tens) before being replaced.

The digital electronic microprocessor panel can adjust:

- The sieving time from 0 to 99 minutes
- The vacuum range from 0 to 65 mbar
- The calibration function

The unit is supplied complete with aspirator device, plexiglass cover, filter cartridge, 5 collecting plastic bags, accessories.

Power supply: 230V 1ph 50/60 Hz

Dimensions: 450 x 600 x 400 mm

Weight:

25 kg approx



A058-53

A058-05N with sieve

A058-14

A058-15

section A



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

The frame is stainless steel made.

Openings from 5 to 71 microns have "nylon mesh"

Openings from 75 to 4000 microns have "stainless steel mesh"

The sieves include airproof rubber seal.

Note: sieves with stainless steel mesh from 20 to 71 microns and nylon mesh from 75 to 4000 microns are available on request.

SPARE PARTS:

**A058-14** FILTER CARTRIDGE.

**A058-15** PLASTIC BAGS (pack of 5 pcs).

CODE	APERTURE micron	CODE	APERTURE micron	CODE	APERTURE micron	CODE	APERTURE micron
<b>A058-20</b>	5	<b>A058-36</b>	65	<b>A058-64</b>	250	<b>A058-81</b>	1120
<b>A058-21</b>	10	<b>A058-37</b>	70	<b>A058-65</b>	280	<b>A058-82</b>	1180
<b>A058-22</b>	15	<b>A058-38</b>	71	<b>A058-66</b>	300	<b>A058-83</b>	1250
<b>A058-23</b>	20	<b>A058-50</b>	75	<b>A058-67</b>	315	<b>A058-84</b>	1400
<b>A058-24</b>	25	<b>A058-51</b>	80	<b>A058-68</b>	355	<b>A058-85</b>	1600
<b>A058-25</b>	28	<b>A058-52</b>	90	<b>A058-69</b>	400	<b>A058-86</b>	1700
<b>A058-26</b>	30	<b>A058-53</b>	100	<b>A058-70</b>	425	<b>A058-87</b>	1800
<b>A058-27</b>	37	<b>A058-54</b>	106	<b>A058-71</b>	450	<b>A058-88</b>	2000
<b>A058-28</b>	41	<b>A058-55</b>	112	<b>A058-72</b>	500	<b>A058-89</b>	2240
<b>A058-97</b>	45	<b>A058-56</b>	125	<b>A058-73</b>	560	<b>A058-90</b>	2360
<b>A058-29</b>	48	<b>A058-57</b>	140	<b>A058-74</b>	600	<b>A058-91</b>	2500
<b>A058-30</b>	50	<b>A058-58</b>	150	<b>A058-75</b>	630	<b>A058-92</b>	2800
<b>A058-31</b>	53	<b>A058-59</b>	160	<b>A058-76</b>	710	<b>A058-93</b>	3150
<b>A058-32</b>	55	<b>A058-60</b>	180	<b>A058-77</b>	800	<b>A058-94</b>	3350
<b>A058-33</b>	58	<b>A058-61</b>	200	<b>A058-78</b>	850	<b>A058-95</b>	3550
<b>A058-34</b>	60	<b>A058-62</b>	212	<b>A058-79</b>	900	<b>A058-96</b>	4000
<b>A058-35</b>	63	<b>A058-63</b>	224	<b>A058-80</b>	1000		

## Electromagnetic sieve shakers

STANDARDS: EN 932-5 / ISO 3310-1

These Sieve Shakers are activated by electromagnetic impulses and thanks to the triple vibrating action (vertical, lateral and rotational) they are recommended to perform sieving tests where high precision and performance are important, and where continual and intense uses are required. They are therefore suggested for accurate sieving tests, also on fine materials.

These Electromagnetic Shakers are of simple and sturdy construction, can hold up to 10 sieves and they are also suitable for wet sieving tests (accessory mod. A046, A047).

### section A

The separate digital control panel can adjust:

- The sieving time from 1 to 999 minutes
- The vibrating intensity
- The pauses between one vibration and the following one (this is especially indicated for fine material sieving).

Power supply: 230V 50Hz Iph 450/750W



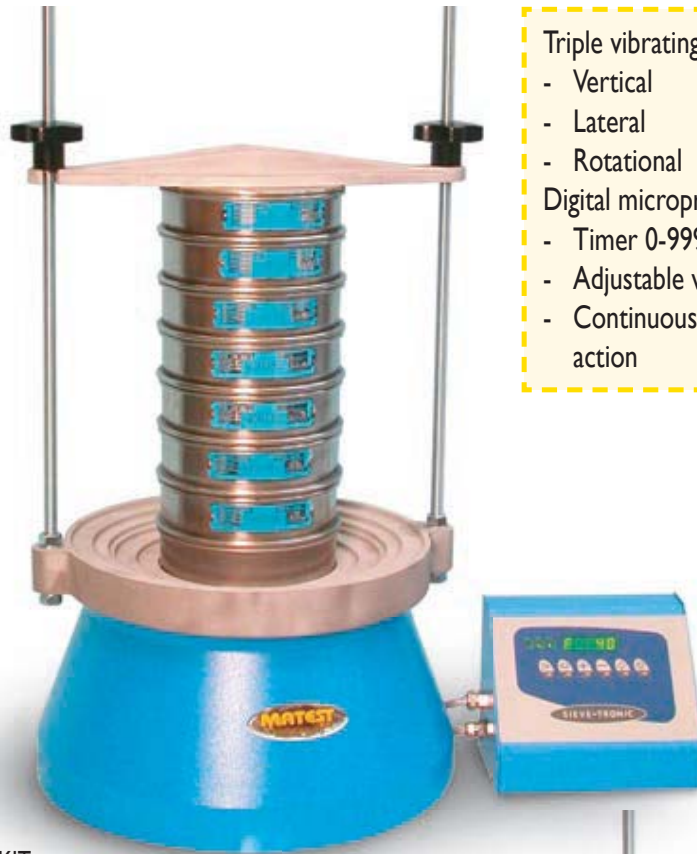
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A059-01 KIT

A059-02 KIT

Model	Dimensions sieves dia.	Dimensions mm.	Weight kg.
<b>A059-01 KIT</b>	200 mm - 8"	320 x 380 x 850	40
<b>A059-02 KIT</b>	200 - 250 - 300 - 315 mm - 8" - 12"	380 x 440 x 1080	65
<b>A059-03 KIT</b>	200 - 250 - 300 - 315 - 350 - 400 mm - 8" - 12"	430 x 460 x 1150	80
<b>A059-04 KIT</b>	200 - 250 - 300 - 315 - 400 - 450 mm - 8" - 12" - 18"	480 x 500 x 1150	85



A059-03 KIT

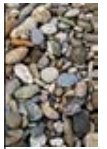
Triple vibrating action:

- Vertical
- Lateral
- Rotational

Digital microprocessor control panel with functions:

- Timer 0-999 minutes
- Adjustable vibration intensity
- Continuous or intermittent adjustable vibrating action

section A



**A058  
Noise reduction cabinet**

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



A058 + A059-03 KIT



A059-04 KIT

ACCESSORY:

**A059-21**

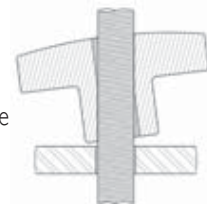
KNOBS for fast clamping/release of the upper beam.  
Useful for fast vertical displacement of the beam.

(Not usable with A059-01 KIT model)

Pack of 2 knobs with rods.



A059-21



A059-21

**MATTEST**

## A061N

### High capacity sieve shaker

Designed for sieving considerable quantities of any material. The screen shaker accepts up to 30 litres (60 ÷ 70 kg) of sample. Sturdy made, the machine can hold six screen trays and dust pan.

Supplied complete with dust pan, but "without" screen trays to be ordered separately.

It cannot be sold in CE markets without protection (see accessories).

Power supply: 230V 50 Hz 1ph 750 W

Dimensions: 585x790x850 mm

Weight: 180 kg approx.



A061N  
with Screen Trays

section A



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#### ACCESSORIES:

##### A061-97

SAFETY DOORS, upper and frontal, complete with micro-switch, complying to CE Safety Directive.

If the door is opened while the shaker is working, it automatically stops.

The doors also protect from dust.

##### A061-98

SECURITY CABINET, steel made with microswitch, complying to CE Safety Directive, lined with sound-proofing material for noise reduction. If the door is opened while the shaker is working, it automatically stops.

The cabinet also protects from dust.

Overall dimensions: 900 x 900 xh 1350 mm

**A061-03** TRAY ONLY, without mesh, size 457x660x75 mm, suitable for mesh openings from 125 to 6,3 mm.

**A061-05** TRAY ONLY, without mesh, size 457x660x75 mm, suitable for mesh openings from 5,6 to 1 mm.



A061N + A061-97



A061N + A061-98

##### A061-06

TRAY ONLY, without mesh, size 457x660x75 mm, suitable for mesh openings from 0,850 to 0,063 mm.



SCREEN TRAYS FOR SIEVE SHAKER A061 IN, SIZE 457X660X75 MM, ROBUST STEEL GALVANIZED FRAME.  
 STAINLESS STEEL WOVEN WIRE MESH.  
 STANDARDS: EN 933-1, 933-2 / ASTM E11 / ISO 3310-1 / BS 410

Aperture size mm	ASTM number	Model
0,038	400	A061-78
0,045	325	A061-79
0,053	270	A061-80
0,063	230	A061-81
0,075	200	A061-07
0,080	-	A061-08
0,090	170	A061-09
0,100	-	A061-10
0,106	140	A061-11
0,125	120	A061-12
0,150	100	A061-13
0,160	-	A061-14
0,180	80	A061-15
0,200	-	A061-16
0,212	70	A061-17
0,250	60	A061-18
0,300	50	A061-19
0,315	-	A061-20
0,320	-	A061-21
0,355	45	A061-22
0,400	-	A061-23
0,425	40	A061-24
0,500	35	A061-25
0,600	30	A061-26
0,630	-	A061-27
0,710	25	A061-28

Aperture size mm	ASTM number	Model
0,800	-	A061-29
0,850	20	A061-30
1,000	18	A061-31
1,180	16	A061-32
1,25	-	A061-33
1,400	14	A061-34
1,600	-	A061-35
1,700	12	A061-36
2,000	10	A061-37
2,360	8	A061-38
2,500	-	A061-39
2,800	7	A061-40
3,150	-	A061-41
3,350	6	A061-42
4,000	5	A061-43
4,750	4	A061-44
5,000	-	A061-45
5,600	3,5	A061-46
6,350	1/4"	A061-47
6,700	0,265"	A061-48
7,100	-	A061-49
8,000	5/16"	A061-50
9,500	3/8"	A061-51
10,00	-	A061-52
11,20	7/16"	A061-53
12,50	1/2"	A061-54

Aperture size mm	ASTM number	Model
13,20	0,530"	A061-55
14,00	-	A061-56
16,00	5/8"	A061-57
19,00	3/4"	A061-58
20,00	-	A061-59
22,40	7/8"	A061-60
25,00	-	A061-61
25,40	1"	A061-62
26,50	1,06"	A061-63
28,00	-	A061-64
31,50	1 1/4"	A061-65
37,50	1 1/2"	A061-66
40,00	-	A061-67
45,00	1 3/4"	A061-68
50,00	2"	A061-69
53,00	2,12"	A061-70
56,00	-	A061-70S
63,00	2 1/2"	A061-71
75,00	3"	A061-72
80,00	-	A061-73
90,00	3 1/2"	A061-74
100,0	4"	A061-75
106,0	4,24"	A061-76
125,0	5"	A061-77

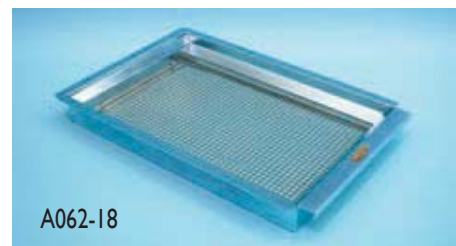
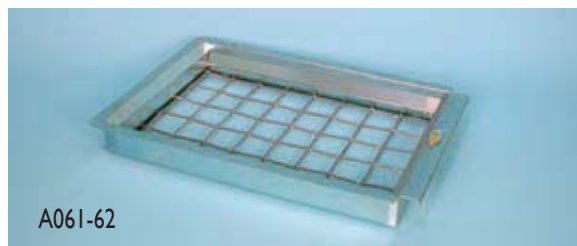
**A061-96** SPARE collecting pan

SCREEN TRAYS WITH PERFORATED PLATE, "SQUARE HOLES" STANDARDS: EN 933-2 / ISO 3310-2 / BS 410

Aperture mm	Model
4,00	A062-11
4,75	A062-12
5,00	A062-13
5,60	A062-14
6,30	A062-15
6,70	A062-16
7,10	A062-17
8,00	A062-18
9,00	A062-19
9,50	A062-20
10,00	A062-21
11,20	A062-22
12,50	A062-23

Aperture mm	Model
13,20	A062-24
14,00	A062-25
16,00	A062-26
18,00	A062-27
19,00	A062-29
20,00	A062-30
22,40	A062-31
25,00	A062-32
26,50	A062-33
28,00	A062-34
31,50	A062-35
37,50	A062-36
40,00	A062-37

Aperture mm	Model
45,00	A062-38
50,00	A062-39
53,00	A062-40
56,00	A062-41
63,00	A062-42
75,00	A062-43
80,00	A062-44
90,00	A062-45
100,00	A062-46
106,00	A062-47
125,00	A062-48



section A



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**MATEST**



### A060-01

#### Sieve shaker motor operated

It accepts Sieves having dia. 200 - 250 - 300 - 315 mm, and 8" - 12".

This simple and low cost Sieve Shaker is activated by an electric motor and can hold up to 8 Sieves dia. 200 mm or 7 Sieves dia. 300 mm plus pan and lid. It is possible to perform also wet sieving tests (see accessories mod. A046 and A047)

Provided of timer 0 - 60 minutes.

Power supply: 230V 1ph 50Hz 110W

Dimensions: 350x400x950 mm

Weight: 24 kg approx.



A060-01

### A058-01

#### Sieve shaker hand operated for sieves dia. 200 mm and 8"

Designed for site tests or yard laboratory analysis where electricity is not available. By rotating the crank the shaker applies a vertical and rotational vibration action.

It can hold up to 6 sieves dia. 200 mm or 8" plus pan and lid.

Dimensions: 300x450x600 mm

Weight: 16 kg approx.



A058-01



A057-31 ÷ A057-44

#### Glass microspheres with NIST Certificate for sieves calibration

The calibration of the sieves or the inspection of the wear conditions of the mesh can be performed by using glass microspheres. These models are supplied with NIST Certificate (National Institute of Standard and Technology) in pack of 5 bottle.

#### CALIBRATION GLASS BEADS

Models	Dia. range in mm of bead
A060-31	0.000 a 0.050
A060-32	0.040 a 0.070
A060-33	0.070 a 0.110
A060-34	0.090 a 0.150
A060-35	0.100 a 0.200
A060-36	0.150 a 0.250
A060-37	0.200 a 0.300
A060-38	0.250 a 0.500
A060-39	0.400 a 0.600
A060-40	0.500 a 0.750

Models	Dia. range in mm of bead
A060-41	0.750 a 1.000
A060-42	1.000 a 1.250
A060-43	1.250 a 1.550
A060-44	1.550 a 1.850
A060-45	1.700 a 2.000
A060-46	2.000 a 2.300
A060-47	2.300 a 2.600
A060-48	2.500 a 2.850
A060-49	2.850 a 3.300
A060-50	3.300 a 3.600

Model	Sieve size (µm)	Weight per bottle (g)
A057-31	45	1
A057-32	63	1
A057-33	75	1
A057-34	90	1
A057-45	106	1
A057-35	125	1
A057-36	150	1,5
A057-37	250	2,5
A057-38	300	2,5
A057-39	425	2,5
A057-40	500	2,5
A057-41	600	2,5
A057-42	1000	7
A057-43	1180	10
A057-46	1600/1700	20
A057-44	2000	20

Other models for sieve's sizes not listed in the table can be supplied upon request.

**Sample splitters (Riffle Boxes)**

STANDARDS: EN 933-3 / ASTM C136, 702 / NF P18-553  
 UNI 8520 / AASHTO T27, T87  
 BS 812:1, 1377:2, 1924:1 / UNE 83120

Used for the precise division into two representative portions of materials such as: aggregates, sand, gravel and similar. Painted or stainless steel made, they are supplied with two collecting pans.



Model	Material Steel	Slot width	Max. Size Sample mm	Slot Number	Weight kg	Spare collecting pan
<b>A062</b> <small>NEW</small>	Stainless	1-4" - 6,3 mm	5	12	0,8	<b>A062-02</b>
<b>A063</b> <small>NEW</small>	Stainless	1-2" - 12,7 mm	10	12	1,2	<b>A063-02</b>
<b>A064</b>	Painted	3-4" - 19 mm	13	12	11	<b>A064-02</b>
<b>A065</b>	"	1" - 25,4 mm	20	12	11	<b>A065-02</b>
<b>A065-01</b>	"	1 1-2" - 38 mm	25	8	11	<b>A065-02</b>
<b>A065-03</b> <small>NEW</small>	"	= = - 45 mm	35	8	12	<b>A065-04</b>
<b>A066</b>	"	2" - 50,8 mm	40	8	13	<b>A066-02</b>
<b>A067</b>	"	2 1-2" - 63,5 mm	50	8	18	<b>A067-02</b>

section A



**A068 Large capacity sample splitter**

STANDARDS: EN 933-3 / ASTM C136 / NF P18-553 / UNI 8520  
 AASHTO T27, T87 / BS 812:1, 1377:2, 1924:1  
 UNE 83120

Designed for the reduction of test samples which are too large in volume to be conveniently handled. It handles any material from sand sizes up to dia. 108 mm. Each chute bar is 12 mm wide so that openings of 12 - 24 - 36 - 48 - 60 - 72 - 84 - 96 - 108 mm are possible. Complete with two collecting pans.  
 Clam shell hopper: 30 litres capacity.  
 Very sturdily constructed, it is totally galvanized for rust protection.  
 Weight: 55 kg

ACCESSORY:

**A068-11** WHEELS (Kit of 4) with brake for an easy displacement of the large splitter in the laboratory.



SPARE-PART:

**A068-01** Collecting pan for mod. A068



**Bulk density and voids measures**

STANDARDS: EN 1097:3 / ASTM C29-97 / BS 812  
 UNI 8520 :6 / ISO 6872 / CNR N. 62, 63, 64

Used to determine the loose bulk density and voids of aggregates. Stainless steel made, the 10, 20 and 50 litres models have handles.

**A069**

Measure 1 litre cap.

**A069-01**

Measure 5 litres cap.

**A069-02**

Measure 10 litres cap.

**A069-03**

Measure 20 litres cap.

**A069-04**

Measure 50 litres cap.



A069-02

A069-01

MATEST

## A070

### Flakiness/thickness gauge

STANDARD: BS 812

To verify if aggregate is flaky; i.e. if its thickness is less than 0,6 of its nominal size. Constructed of heavy gauge stainless steel sheet.  
Weight: 600 g



## A071

### Length gauge

STANDARD: BS 812

To determine if aggregate is elongated; i.e. if length is more than 1,8 of nominal size. Mounted on a hardwood base.  
Weight: 1 kg

### Lightweight aggregates

#### Crushing resistance determination

STANDARD: EN 13055-1 method 1 and 2

MODELS:

#### A081-01 method 1

Apparatus for the determination of the crushing resistance of lightweight aggregates having diameter from 4 to 22 mm, and volumic mass over 150kg/m<sup>3</sup>, composed by: upper and lower cylinder inside diameter 113 mm, ring with adjustable height, piston, base. Made of steel, plated against corrosion.  
Dimensions: 180 mm dia. by 260 mm height  
Weight : 15 kg approx.

#### A081-02 method 2

Apparatus for the determination of the crushing resistance of lightweight aggregates having volumic mass lower than 150kg/m<sup>3</sup>, composed by: upper and lower cylinder inside diameter 76 mm, piston, base. Made of steel, plated against corrosion.  
Dimensions: 100 mm dia. by 200 mm height.  
Weight: 6 kg approx.

NOTE:

To carry out this test a Servoplus testing machine equipped with Servostrain (see pag. 165) is needed.



A081-01

## A072

### Shape gauge - Shape index

STANDARDS: EN 933-4, 933-5, 933-7 / DIN 4226 / CNR N.95 NLT 354

For measuring the length/thickness ratio of individual particles.  
Weight 500 g.



### Geometrical properties of aggregates Determination of the efflux index of fine aggregates.

STANDARDS: EN 933-6 / NF P18-564 / CNR No. 113  
ASTM C1252

## A073

### Efflux index apparatus

Used to measure the efflux index of fine aggregates (shape and angularity), having dimensions up to 4 mm. The efflux index of an aggregate is the required time in seconds of a known volume of aggregates to flow from a known opening.

The unit is basically formed by a container, two polycarbonate funnels having 85 mm height, 60° conical part, which end has dia. 12 or 16 mm., base support, valve, decanter.

Dimensions: 200 x 240 xh 600 mm. Weight : 8 kg approx.



A073



**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  
UNE 83116 / AASHTO T96 / CNR N° 34 / NLT 325

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 31÷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.

Supplied "without" abrasive charges to be ordered separately according to the Standards the machine has to comply. It cannot be sold in the CE markets without protection (see accessories).

Power supply: 230V 50 Hz 1ph 750W

Dimensions: 1000x800x1000 mm

Weight: 370 kg

NEW

NEW



A075N

section A



45

NEEDED ACCESSORY:

**A076-01** Set of 12 ABRASIVE CHARGES, conforming to ASTM AASHTO/CNR/UNI/UNE/NLT Standards.

**A076-02** Set of 12 ABRASIVE CHARGES, conforming to EN NF Standards.

UPGRADING ACCESSORIES:

**A075-11**

SECURITY CABINET, manufactured from sheet steel, 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: 1100x1180x1250 mm

Weight: 150 kg approx.



A076-11



A075N+A075-11



A075N+A075-12

A076-01



**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: 1100x1180x1250 mm

Weight: 160 kg approx.

**A076-11**

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

MATEST

## A077

### Micro-Deval testing machine

DETERMINATION OF THE RESISTANCE TO WEAR

STANDARDS: EN 1097-1 / EN 13450

NF P18-572 / NF P18-576

UNE 83115 / CNR N° 109

Used to determine the resistance of aggregates by abrasion. The machine essentially comprises a heavy steel frame on which the following stainless steel cylinders can be mounted:

4 cylinders dia 200x154mm, or

2 cylinders dia 200x400mm, or

2 cylinders dia 200x154mm and 1 dia 200x400mm

The Micro-Deval is supplied complete with separate

control panel fitted with a digital automatic revolutions counter.

Supplied "without" stainless steel cylinders and "without" stainless

steel spheres which have to be ordered separately

(see needed accessories).

It cannot be sold in CE markets without security cabinet

(see mod. A077-01)

Power supply: 230V 50Hz 1ph 1100W

Dimensions: 1000x450x920mm

Weight: 150 kg approx.



section A



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UPGRADING ACCESSORIES:

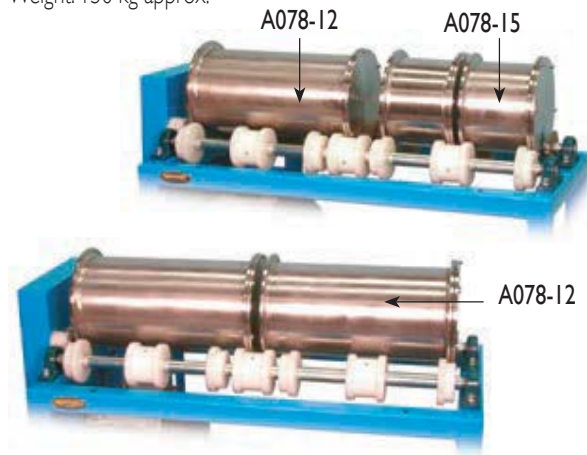
**A078-12** CYLINDER, stainless steel, 200 mm dia. x 400 mm length. Conforming to EN 13450, NF P18-572

**A078-13** SPHERES, stainless steel, 30 mm dia. Pack of 12 pieces. NF P18-576

**A078-14** SPHERES, stainless steel, 18 mm dia. Pack of 52 pieces. NF P18-576

**A078-16** CYLINDER, "HIGH PERFORMANCE", stainless steel, 200 mm dia. x 152 mm length. EN 1097-1

**A048-14** BAR GRID SIEVE, sloth width 9,5 mm. Used to check the wear of the spheres of the Micro-Deval having nominal size 10 mm.



## A077-01

### Micro-Deval Testing Machine

Same to mod. A077, but equipped with security cabinet, manufactured from sheet steel, lined with sound-proofing material for noise reduction, conforming to CE Safety Directive.

When opening the cabinet's door during Micro-Deval working, a microswitch automatically stops the rotation of the cylinders.

Dimensions: 1150x600x1150 mm

Weight: 190 kg approx.

NEEDED ACCESSORIES:

**A078-15** CYLINDER, standard, stainless steel, 200 mm dia. x 154 mm length (4 needed) EN 1097-1

**A078-11** SPHERES, stainless steel, 10 mm dia. Pack of 20 kg EN 1097-1



**A079**

**Deval testing machine**

STANDARDS: NF P18-577 / ASTM D2-33

Used to determine the quality of aggregates by abrasion both by dry and wet procedure. The machine essentially comprises a steel frame on which two cylinders are mounted. The machine is supplied complete with separate control panel fitted with a digital automatic revolution counter, two collecting pans. It cannot be sold in CE markets without security cabinet (see mod. A079-02).

Power supply: 230V 50 Hz 1ph 750W

Dimensions: 1500x520x1280 mm

Weight: 140 kg

**A079-02**

**Deval Testing Machine**

Same to mod. A079, but equipped with security cabinet, manufactured from sheet steel, lined with sound-proofing material for noise reduction, conforming to CE Safety Directive.

When opening the cabinet's door during Deval working, a micro-switch automatically stops the machine.

Dimensions: 1650x650x1400 mm

Weight: 180 kg approx.



A079



A079-02

section A



A080 KIT



A087

**A087  
Scratch hardness  
test apparatus**

STANDARD: ASTM C235

This device is used to determine the quantity of soft particles in coarse aggregates.

The apparatus consists of a metal sliding rod ended with a round point of 1,6 mm diameter, mounted in a suitable frame.

A load of  $8.9 \pm 0,4$  N is applied to the test sample.

Dimensions: 160x200xh350 mm. Weight: 8 kg

**Aggregate impact value apparatus**

STANDARDS: BS 812 / NF P18-574

Used to determine the impact value of aggregates and select them for a given application. The machine has a trip-action hammer release, blow counter device and a built-in operator safety device. Manufactured in heavy duty form with hardened steel surfaces for minimum wear. The complete assembly is cadmium plated for corrosion protection.

Dimensions: 445x300x880mm

Weight: 60kg approx.

THE APPARATUS IS AVAILABLE IN TWO VERSIONS:

- one meeting BS812 Standard
- one meeting NF P18-574 Standard

**A080KIT**

AGGREGATE IMPACT VALUE APPARATUS. BS 812

Consisting of:

**A080-04** TEST FRAME ASSEMBLY

**A080-02** CYLINDRICAL MOULD, dia. 102x50 mm, cylindrical measure dia. 75x50 mm, tamping rod.

**A080-01KIT**

AGGREGATE IMPACT VALUE APPARATUS. NF P18-574

Consisting of:

**A080-04** TEST FRAME ASSEMBLY

**A080-03** CYLINDRICAL MOULD, dia 102x52 mm.

**MATEST**



## S158-20 KIT Sand equivalent test set (complete)

ASSESSMENT OF FINE AGGREGATES

STANDARDS: EN 933-8 / NF XP18-598 / CNR N.27  
UNI 8520-15 / UNE 83131

The set comprises:

- S158-03** Plexiglass measuring cylinder engraved at 100 and 380 mm (5 pieces)
- S158-02** Rubber stopper for cylinder (2 pieces)
- V176-02** Graduated rule 500 mm, stainless steel
- V136-01** Funnel, wide mouth
- S158-05** Measuring can 200 ml capacity
- V121** Plastic bottle, 5 litre capacity
- S158-10** Irrigator tube with stopcock and syphon assembly EN/ASTM
- S158-13** Weighted foot assembly for sand level
- A052-37** Sieve, dia. 200 mm, opening 2 mm
- S158-09** Concentrated stock solution, 1000 ml
- V170** Stop watch, digital
- S158-11** Clamp stand set to hold the syphon assembly with bottle
- S158-12** Portable carrying case, dimensions: 550x250x400 mm  
Total Weight: 18 kg



S158-20 KIT

S158-08

## S158 KIT Sand equivalent test set (complete)

STANDARDS: ASTM D2419 / AASHTO T176

The set is identical to mod. S158-20 KIT except:

- S158-01** Plexiglass measuring cylinder, engraved at 100 and 380 mm, with transparent adhesive label, graduated in mm and inch.
- S158-04** Measuring can 88 ml capacity
- S158-07** Weighted foot assembly for sand level
- A052-44** Sieve dia. 200 mm, opening 4,75 mm



S160-01 N + S158-03 +S158-02

## S159-01 KIT Sand equivalent test set (simple)

STANDARDS:

EN 933-8  
NF XP18-598  
UNI 8520-15  
UNE 83131



S159-01 KIT

S159-11

The set comprises:

- S158-03** Plexiglass measuring cylinder engraved at 100 and 380 mm (4 pieces)
- S158-02** Rubber stopper for cylinder (2 pieces)
- V176-02** Graduated rule 500 mm, stainless steel
- V136-01** Funnel, wide mouth
- S158-05** Measuring can 200 ml capacity
- V121** Plastic bottle 5 litre capacity
- S158-10** Irrigator tube with stopcock and syphon assembly EN/ASTM
- S158-13** Weighted foot assembly for sand level
- S158-09** Concentrated stock solution, 1000 ml  
Total Weight: 5 kg

## S159 KIT Sand equivalent test set (simple)

STANDARDS: ASTM D2419 / AASHTO T176

The set comprises the same items of mod. S159-01 KIT, but it conforms to the above Specifications.

ACCESSORIES:

- S158-08** Metallic funnel, conforming to EN, NF, UNI Specifications.
- S159-11** Carrying case, plastic, housing S159KIT or S159-01KIT, except the bottle V121.



S160 N  
+ S158-03 +S158-02

## S160 N Motorized sand equivalent shaker

STANDARDS: EN 933-8 / ASTM D2419 / AASHTO T176  
NF XP18-598 / UNE 83131 / UNI 8520-15

The unit provides a constant uniform shaking with automatic cycle test. Oscillating excursion is 203 mm at 175÷180 adjustable strokes/min. rate. Complete with digital timer that automatically stops the shaker at the end of the test. It cannot be sold in CE markets without security cabinet (see model S160-01 N)  
Power supply: 230V 1ph 50 Hz 250 W  
Dimensions: 700x360x350 mm. Weight: 30 kg

## S160-01 N Motorized sand equivalent shaker

As described, but equipped with steel Security Cabinet, conforming to CE Safety Directive. When opening cabinet's door during shaker working, a microswitch automatically stops the machine.



**S157 KIT**

**Blue methylene test set**

**ASSESSMENT OF FINES AGGREGATES**

STANDARDS: EN 933-9 / NF P94-068 / UNI 8520-15 / UNE 83180

Utilized to determine the clay content in the fine portions of the aggregates. The set comprises:

**S157-01** Electric stirrer adjustable from 400 to 700 rpm, complete with 70 mm dia. propeller. 230V 1ph 50 Hz

**S157-06** Support base for stirrer

**S157-02** Burette 50 x 0,1 ml with stopcock

**S157-07** Support base for burette

**S157-08** Pan 200x150x80 mm

**S157-03** Filter paper 90 mm dia. (pack of 100)

**S157-04** Glass rod dia. 8x300 mm

**S157-05** 2000 ml capacity plastic beaker

**V300-28** Methylene blue, 100 g

**V300-29** Kaolinite, 500 g

Total Weight: 10 kg

NOTE: Each item can be ordered separately.

ACCESSORY:

**S157-10** AUTOMATIC DISPENSER, 0-10 ml x 0,1 ml grad.

Capacity 1000 ml (as an alternative to the Burette S157-02+S157-07)



**S157-20**

**Automatic Methylene Blue tester**

This instrument determines automatically the quantity of clay in sand. It grants accurate and repeatable test results, saving a lot of time (approx. 30 minutes each test).

The apparatus is composed by: precision pump, colorimeter, control unit, filters, liquids, powder; accessories.

Power supply: 230V 1ph 50Hz

Dimensions: 300x400x350mm approx.

Weight: 10 kg about



**Test for geometrical properties of aggregates.**

**Classification test for the constituents of coarse recycled aggregate.**

STANDARD: EN 933-11:2009

**S156-20**

**Plunger**, for the graduated cylinder: The test consists of hand sorting particles from a test portion of coarse recycled aggregate into a list of constituents. The proportion of each constituent in the test portion is then determined and expressed as a percentage by mass, except for the proportion of floating particles which is expressed as a volume by mass.

Stainless steel made

Weight: 500 g approx.

ACCESSORY:

**V101-07** GLASS GRADUATED CYLINDER, 2000 ml capacity



**B022**

**Bottle roller**

**FOR THE DETERMINATION OF CLAY, SILT AND DUST IN FINE AND COARSE AGGREGATES TO BS SEDIMENTATION METHOD**

STANDARDS: BS 812 / ASTM C117

To rotate one up to three bottles or jars simultaneously about their longitudinal axis with rotation speed adjustable from 0 up to 85 rpm

Supplied complete with

timer 0-6 hours

Power supply: 230V 50/60 Hz 1ph

Dimensions: 385x295x160 mm

Weight: 10 kg approx.



**B022 SP**

**Bottle Roller**

Same to mod. B022, but equipped with timer range 0-99 hours

ACCESSORY:

**S132-03**

BOTTLE, pyrex glass, 1 litre capacity, with airtight stopper.

**S144**

**Andreasen pipette**,

25 ml capacity, glass made, used for an accurate and precise extraction of suspension material for analysis.

**S144-01**

PIPETTE STAND, to accurately raise and lower the Andreasen pipette with no transmission of vibrations. Weight: 10 kg approx



section A





**A124**

**Filler compaction apparatus**

DETERMINATION OF THE VOIDS CONTENT OF DRY COMPACTED FILLER.

STANDARDS: EN 1097-4 comparable to BS 812 / CNR N° 23 NLT 177

The apparatus consists of: cylinder having inside dia. 25,4 mm; plunger freely sliding into the cylinder with max. lateral play of  $0,20 \pm 0,05$  mm; four columns and metallic base holding the whole.

To perform the test a measuring device (vernier caliper with 0,01 mm accuracy) is required: see accessory.

Weight: 4 kg

ACCESSORIES:

**A124-01** FILTER PAPER 25 mm dia. (pack of 100).

**V175-03**

DIGITAL VERNIER CALIPER 0 - 150 mm x 0,01 mm sens.



**A084**

**Siphon can apparatus**

STANDARD: BS 812 - part 2

Used to determine the moisture content at known conditions.

Supplied complete with measuring cylinder, rubber pipes fitted with screw clips, stirring rod.

Weight: 5 kg



**A082**

**Aggregate crushing value apparatus**

**dia. 150 mm**

STANDARD: comparable to BS 812:110

Comprising 150 mm nominal diameter steel cylinder; plunger; base plate, tamping rod and measure 115 mm diameter x 180 mm deep. Used for aggregate passing 12.7 mm and retained by 9.52 mm sieve.

The complete assembly is cadmium plated for corrosion protection. Weight: 20 kg

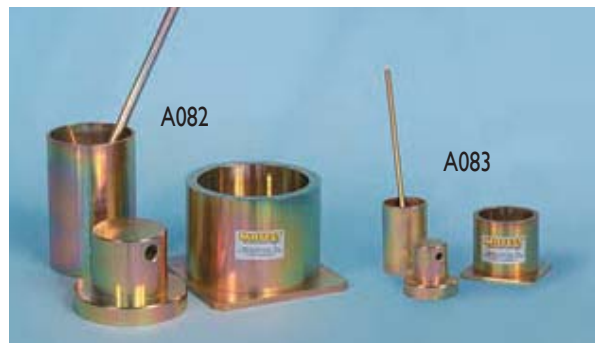
**A083**

**Aggregate crushing value apparatus**  
**dia. 75 mm**

STANDARD: comparable to BS 812:110

Comprising 75 mm nominal diameter steel cylinder; plunger; base plate, tamping rod and measure 57 mm diameter x 90 mm deep. Used for aggregate smaller than 9.52 mm

The complete assembly is cadmium plated for corrosion protection. Weight: 8 kg



**A085**

**Quartering canvas** (not illustrated)

STANDARD: ASTM C702 - Method B

Used in field for quartering soil and aggregates.

Size: 140x140 cm

**A086**

**Volumeter for aggregates**

STANDARD: BS 812

Used to measure coarse aggregate density by water displacement method.

Formed by a cylindric metal container dia. 150x350 mm fitted with a siphon tube at 250 mm from bottom. Weight: 3 kg

ACCESSORY:

**V101-04** Graduated glass cylinder 250 ml capacity



**Determination of particle density and water absorption of aggregates**

STANDARDS: EN 12390-7 / EN 1097-6 / UNI 6394-2 / BS 812:2, 1881:14 / ASTM C127, C128 / AASHTO T84 / DIN 12039 / NLT 154

To perform this test, additional general purpose equipment are required, such as: Oven, Sieves, Balances etc., and the following specific apparatus:

**V041 Density basket**, dia. 200 mm by 200 mm height, mesh size 3,35 mm, all stainless steel made. Other models of density baskets listed at page 472

**V085 Specific gravity frame.**  
Technical data: see Sector "V" pag. 472

**Pyknometer**, pyrex glass, complete with stopper; capillary tube and funnel; used to determine the voids and bulk density of aggregates.

**V103** Capacity 500 ml  
**V103-01** Capacity 1000 ml

**Pyknometer**, pyrex glass, wide mouth dia. 50 mm, complete with capillary tube stopper; used to evaluate the volume density and voids of aggregates.

**V105-04** Capacity 500 ml  
**V105-05** Capacity 1000 ml  
**V105-06** Capacity 2000 ml

**S148**

**Sand absorption cone and tamper**, used in determining the specific gravity and absorption of fine aggregates.

**Determination of the particle density of filler. Pyknometer method**

STANDARDS: EN 1097-7 / NF P18-558 / BS 812

To perform this test additional general purpose equipment are required such as: Oven, Sieves, Balance etc., and the following specific apparatus:

**Specific gravity Bottle, Gay Lussac type**, pyrex glass, complete with capillary tube stopper; to determine the particle density and specific gravity of filler in fine aggregates.

**V108-01** Capacity 50 ml  
**V108-02** Capacity 100 ml  
**V108-03** Capacity 250 ml

**E136**

**Water bath**, with heating/circulating system, all stainless steel made. Equipped with cooling coil device for connection to water net. Capacity: 40 litres. Digital thermostat  
Temperature range: ambient to 60°C.  
Accuracy: +/- 0,5°C.  
Inside dimensions: 510x350x230 mm  
Overall dimensions: 680x420x420 mm  
Power supply: 230W 50/60Hz 1ph 2000W  
Weight: 28 kg approx.



E136



V041

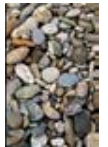


V085

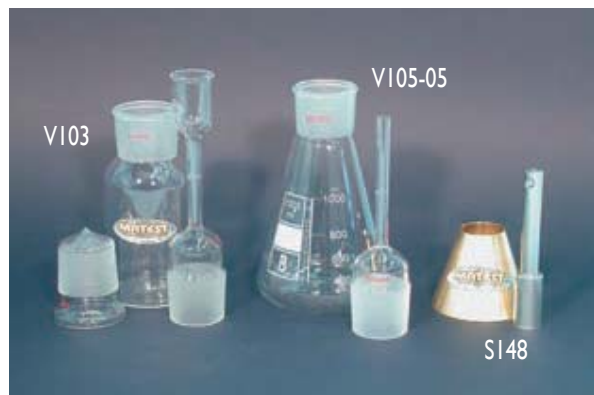
V073-01

V041

section A



51



V103

V105-05

S148



V108-01

V108-02

**Determination of the relative density and water absorption of aggregates max. 10 mm size**

STANDARDS:  
BS 812:2, 1377:2 / ASTM D 854  
AASHTO T100 / EN 1097-6

**S147**

**Pyknometer**, glass made, with aluminium cone and rubber seal. Capacity: 1 kg



S147

MATEST



## A092

### Laboratory jaws crusher

STANDARD: UNE 83 120 / Comparable to EN 933-3, EN 933-6

Designed to crush any sort of material, also the hardest.

The structure is from cast iron, the shaft from rectified steel, the jaws from manganese. Jaws opening is regulated from 5 to 15 mm by a wedge.

Jaw size: 100x60 mm

Production: 100 to 400 kg/hour

The crusher is suitable to prepare the material to be reduced to powder with the jar mill A091 serie.

Complete with steel cabinet conforming to CE safety Directive, and collecting pan.

Power supply: 230V 50 Hz 1ph 1100W

Dimensions: 450x1000x620 mm

Weight: 115 kg



A092  
without cabinet



A091-10 + A091-11



A092  
with cabinet

## A091-10

### Jar mill

Designed to reduce from 5 mm to powder granulometric materials like: cement, stones, rocks, hard materials. Supplied "without" jar to be ordered separately (see needed accessory).

This mill can accept jars having capacity 300 cc. or capacity 1000 cc. Jar is in prokorund material with relevant hard porcelain spheres.

Noise reduction steel cabinet and microswitch conforming to CE safety Directive.

Built in timer: Rpm: about 400

**It can be used only for wet tests.**

Power supply: 230V 50 Hz 1ph 750W

Dimensions: 350x710x410 mm

Weight: 50 kg



Jars detail

"NEEDED" ACCESSORY:

**A091-11** JAR, 300 cc. capacity complete with spheres.

**A091-12** JAR, 1000 cc. capacity, complete with spheres.

## A091-02

**Jar mill** capacity 1500 cc.

Same to mod. A091-10, but with jar capacity of 1500 cc.

Supplied "complete" with jar and spheres.

## A093

### Dry mixer

Designed to mix dry materials like: powders, cement, gypsum and granulometric materials. In a short time it assures a perfect and homogeneous mixture. The mixer consists of two opposite asymmetric cones and a pan for collecting the mixed material. Supplied complete with timer.

The volume of the cone is 30 litres.

Mixing capacity: 10 kg of material

Speed rotation: 30 rpm

It cannot be sold in CE markets without security cabinet (see mod. A093-11)

Power supply:

230V 50 Hz 1ph 750W

Dimensions: 700x700x1200 mm

Weight: 130 kg



A093

ACCESSORY:

## A093-11

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

Dimensions: 850x800x1300 mm

Weight: 50 kg approx.

## A096

### Hammer grinding mill, for laboratory

Used to mill small quantities of product for laboratory testing.

Feeding is via vertical input which allows products with a particle size of max. 15 mm

It comprises a three long-lasting blades manufactured from stainless steel and an interchangeable screen with round perforations from 1 to 5 mm diameter.

- Grinding chamber dia. 110 mm - 3 fixed hammers
- Output particle size: various opening size 1, 2, 3, 4 and 5 mm (one screen included)

- Max. hardness of the material to grind: 6 Mohs

- Chamber volume: 0,5 l - Speed: 3000 rpm

- Power supply: 230V 1ph 50/60Hz 1,1kW

- Dimensions: 520 x 230 xh 420 mm

- Weight: 25 kg

## A096-11

SCREEN size: 1, 2, 3, 4, 5 mm; additional / spare.

(please specify opening when ordering)



A096

**A113**  
**SKID RESISTANCE AND FRICTION TESTER**

STANDARDS: EN 1097-8 / EN 1338, 1339, 1341, 1342 / EN 13036-4 / EN 1436 / BS 812:114 / ASTM E303 (see note)

The apparatus is suitable for both site and laboratory applications to perform two types of tests:

- For measuring pavement (road asphalt) surface frictional and skid resistance properties.
- For polished stone value tests on aggregates (curved specimens) from accelerated polishing tests.

The skid tester is also suitable to perform tests on:

- Natural stones conforming to EN 1341, 1342.
- Concrete block pavers conforming to EN 1338.

The tester measures the energy loss when a rubber slider edge is propelled over the surface under test.

The slider lifting device is incorporated in the pendulum base assuring accurate adjustment operations.

The height adjusting system is simple and reliable.

The pointer, made from light alloy, has extremely low frictions granting high precision results.

The release mechanism of the pendulum arm has an original solution reducing the friction to minimum for better accuracy.

The skid tester is supplied complete with:

- Additional incorporated scale for tests on Polished Stone Value specimens.
- Rule, plexiglass made, for sliding length verification.
- Thermometer range -10 to +110°C. for surface temperature measurement.
- Stool, wash bottle, bristle, tool set for machine use.
- Carrying case.
- Calibration Certificate conforming to EN 1097-8.

The tester is supplied "WITHOUT" rubber sliders that have to be ordered separately (see accessories).

Case dimensions: 730 x 730 x 330 mm. Weight: 32 kg

NOTE: **The tester is supplied calibrated to meet EN and BS Specifications. On request Matest can supply the skid tester calibrated to meet ASTM E303 Specifications.**



A113

**A113-01**  
**Skid Tester - ASTM E303**

As above, but calibrated to meet ASTM E303 Specifications.

ACCESSORIES:

**A110-03** Mounted rubber slider for site use (pavement surface), complete with conformity certificate.

**A110-01** Mounted rubber slider for Polished Stone Value tests (laboratory), complete with conformity certificate.

**A110-11** Metal base plate for Polished Stone Value tests in laboratory, and for tests on natural stones and concrete block pavers. Supplied "without" specimen clamping devices, to be ordered separately.

**A110-12** Clamping device for Polished Stone Value tests in Laboratory.

**A110-13** Clamping device for tests on natural stones (EN 1341, 1342); for concrete block pavers (EN 1338) and skidding tests on wooden floor (EN 1339).

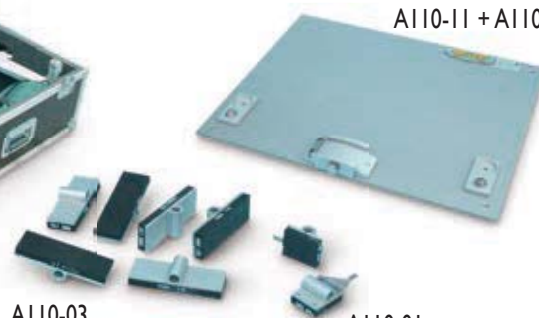
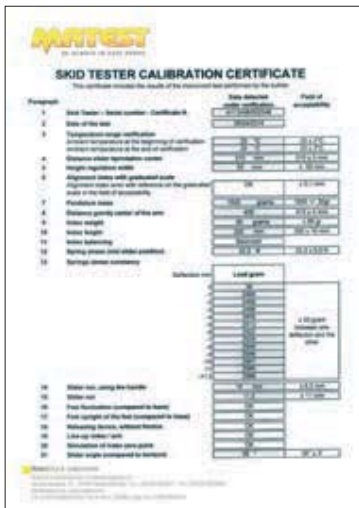
**A110-20** Pink lapping film (10 sheets) for Skid Calibration.

A110-11 + A110-12



A113  
in carrying case

Calibration certificate  
to EN 1097-8



A110-03

A110-01



## AI28N

### Accelerated polishing machine - Matest Made

#### DETERMINATION OF THE POLISHED STONE VALUE

STANDARDS: EN 1097-8, EN 1341, 1342, 1343 / BS 812:114 / NF P18-575 / CNR N.105

It measures the resistance of road aggregates, paving stones, paving blocks, to the polishing action of vehicle tyres on a road surface.

The specimens are manufactured with suitable moulds.

The specimen is then located on the Road Wheel accepting 14 specimens.

The wheel is now rotated and enters in contact with solid rubber tyre, spring loaded.

Abrasive charges are continuously introduced by two automatic mechanical feeders (hoppers).

The feeders are held by a suitable support disjoined from the machine body; this solution safeguards feeding calibration and reliability/life of the hoppers from the influence of test execution vibrations.

Road wheel speed: 310 to 330 r.p.m.

The water is supplied at a controlled rate through a water container equipped with flow regulator:

The digital control panel, foreseen in the back side of the machine, allows to select the test time.

During the test execution the display shows the remaining time and the speed rotation of the wheel holding the specimens.

The machine provides a method of preparing polished stone specimens for use with the Skid Resistance Tester mod. AI 13 when used in Laboratory.

The unit is supplied complete with 2 rubber wheels (one for corn and one for flour emery), set of 4 specimen moulds and 2 mould covers, while control stone, corn and flour emery have to be ordered separately (see accessories).

Power supply: 230V 50 Hz 1ph 750W

Dimensions: 1800x820x600 mm

Weight: 175 kg



AI28N

## C129

**Abrasion Böhme tester**, to measure volume loss in a specimen under abrasion stress in tests such as:

- paving stones
- concrete slabs
- slabs made of natural rocks
- natural stone slabs

STANDARDS: EN 1338:2004 / EN 1339, 1340, 13892-3 / EN 14157  
DIN 52108

See section "C" Concrete pag. 250



C129



AI28N detail

#### ACCESSORIES:

**AI28-02** Corn Emery, 25 kg pack

**AI28-03** Flour Emery, 5 kg pack

**AI28-04** Control stones, ungraded, 25 kg bag.

**AI28-05** Friction Tester Reference Stone (Criggion Stone), ungraded, 25 kg bag.

**A049-02** Flakiness sieve, slot 7,2 by 40 mm., used to retain the road aggregates.

#### SPARE PARTS:

**AI28-11** Mould (without cover) to prepare the specimen.

**AI28-12** Cover for the mould.



**A111N**

**Abrasion machine - Matest Made**  
**AGGREGATE ABRASION VALUE (AAV) DETERMINATION**

STANDARDS: EN 1097-8 / Comparable to BS 812-113  
 The test gives a measure of the resistance of aggregates to surface wear by abrasion.

Inadequate abrasion of road-surfacing aggregates means an early loss of the texture depth required to maintain high-speed skidding resistance.

The machine consists of a heavy duty mainframe on adjustable feet, steel lap wheel 615 mm diameter; that rotates in a horizontal plane at 28/31 r.p.m., precision machined steel shaft and sealed bearings, resilient mounted electric gearmotor; scraper blades for sand removal, revolution counter.

Supplied complete with two specimen moulds, two trays, weights, fixing device.

Power supply: 230V 1ph 50/60 Hz  
 Dimensions: 1130x710x1100 mm  
 Weight: 200 kg



A111N

ACCESSORIES:

- A111-11** Graded silica sand. Pack of 25 kg.
- V179-05** Soft hair brush 3 mm dia. BS 812

SPARE PART:

- A111-12**  
Two specimen moulds.



A111-12

**A112**

**Abrasion tester for natural stones and concrete**  
**ABRASION RESISTANCE ON NATURAL STONES AND CONCRETE TILES FOR PAVING**

STANDARDS: EN 1338, 1341, 1342, 1343 / EN 14157  
 CEN ISO-TC 178 / UNI 10532 / BS 6717:2001

Used to determine the resistance to abrasion and wear of concrete products and natural stones, by measuring the length of a groove produced on the specimen surface by a disc with thickness of 70 mm that rotates at controlled speed and makes a constant pressure on the specimen. A charge of abrasive material must be interposed between the disc and the specimen. The instrument is supplied with electronic speed controller and shutting off device after the set number of revolutions, 1 kg of abrasive material, calibration plate made of boulonnaise marbre, accessories and cabinet to CE Safety Directive.

Power supply: 230V 50/60 Hz 1ph 500W  
 Dimensions: 450x420x800 mm.  
 Weight: 85 kg



A112-05

A112 / A112-10

**A112-10**

**Abrasion tester for bricks and glazed tiles**  
 STANDARDS: EN 102 / EN 12808-2 / CEN ISO-TC 178

ISO 10545-6

Same to mod. A112 but with disc thickness of 10 mm. Suitable for bricks and ceramic glazed tiles.

SPARES:

- A112-01** Abrasive white corundum sand 80 grade. Pack of 5 kg.
- A112-05** Calibration plate made of boulonnaise marbre.





**A105**  
**Calcimeter,**  
**(Gasometer)**  
**Dietrich-Frühling**  
**CARBONATE CONTENT**  
**OF AGGREGATES**

Used for the determination of calcium carbonate ( $\text{CaCO}_3$ ) in certain products such as limestone and lime marl. It mainly consists of a glass container in which the reaction between the calcium carbonate present in the product and a solution of hydrochloric acid takes place.

The gased product is collected and measured by a device connected to the container.

As the volume of the produced gas ( $\text{CO}_2$ ) is in relation to the  $\text{CaCO}_2$  amount contained in the material, it is possible to calculate the percentage of  $\text{CaCO}_3$

Dimensions: 400x200x1100 mm

Weight: 13 kg



A105

ACCESSORIES:

**A116-11**

GAS JAR to determine the specific gravity of soils. Complete with glass cover. Diameter 75 mm by 300 mm height. Weight: 1,3 kg

**A116-12** RUBBER BUNG for the gas jar A116-11



**C279-02**

SEPARATE CONTROL PANEL, complete with ON/OFF switch, timer, fuse, electric protections.

**A108**

**Crushing coefficient machine**

STANDARD: CNR N°4

Composed by a metallic guide 500 mm long and 140 mm wide, suitable to contain 500 gr. of testing aggregates.

The guide is slid lengthwise and transversalwise through hand-wheels.

In the center of the table a metallic wheel 400 kg weight with band of 50 mm wide is foreseen.

The test is performed by passing the wheel on the aggregates contained into the guide for twelve times.

Dimensions: 1200x500x1850 mm

Weight: 640 kg



A108



C279-02

A117 + A116-11 + A116-12

**A117**  
**End-Over-End shaker**

STANDARD: EN 1997-2 / BS 1377:2

Used to determine the specific gravity of soils, it rotates two gas jars at approx. 50 rpm to satisfy BS Standard.

The shaker is equipped with an original friction device conforming the unit to CE Safety Directive.

Supplied "without" gas jars to be ordered separately

Power supply: 230V 50 Hz 1ph 150W

Dimensions: 550x430x500 mm

Weight: 20 kg

**S132N**

**Colour standard chart**

STANDARDS: ASTM C40-11 Method D / AASHTO T21 / UNI 8020-14

For the determination of the organic impurities in soils and fine aggregates.

Chart with 5 glass reference scales.



S132-03

S132-01

S132-02

S132N

**S132-01** Graduated impurities test bottle, stoppered, pyrex glass, 500 ml - ASTM C40

**S132-02** Graduated impurities test bottle, stoppered, pyrex glass, 500 ml, marked at 130 and 200 ml - UNI 8020-14

**S132-03** Graduated impurities test bottle, stoppered, pyrex glass, 1000 ml - ASTM C40

**V300-24** Sodium Hydroxide, pack of 1000 g



**Tests for thermal and weathering properties of aggregates**  
**Determination of resistance to freezing and thawing**

STANDARDS: EN 1367-1 / EN 932-5

It gives the needed informations on the aggregates subject to freeze and thaw test cycles.

The cold stress on aggregates depends from the saturation degree of the water and from the freeze percentage. The test can be performed on aggregates having dimensions from 4 to 63 mm.

**A103-10**

**Container**, stainless steel made, having nominal capacity of 2000 ml.

Supplied complete with stainless steel cover.  
 Weight: 600 g approx.

**A103-11**

**Ballast** for the test container, plated steel made, used for tests on lightweight aggregates.

Weight: 2 kg approx.


NOTE: To perform the test sieves with different openings according to the dimensions of the aggregates are also requested


**Magnesium sulphate test**


Tests for thermal and weathering properties of aggregates.  
 STANDARDS: EN 1367-2, also comparable to ASTM C88  
 UNE 7136 / UNI 8520-10



**A103** BASKET, stainless steel mesh, 120 mm dia. x 160mm high, 3,35 mm opening

**A103-01**  BASKET, stainless steel mesh, 95 mm dia. x 120mm high, 1.18 mm opening

**A103-02**  BASKET, stainless steel mesh, 95 mm dia. x 120mm high, 0.600 mm opening

**A103-03**  BASKET, stainless steel mesh, 65 mm dia. x 80mm high, 0,150 mm opening

**V172-05** HYDROMETER, calibrated at 20°C, range 1200 – 1300 g/ml., accuracy 0,001 g/ml

**V125-03** CONTAINER, tinned steel with airtight lid, 200 mm dia. x 200 mm high.



**Determination of the behaviour and resistance to freezing and thawing of aggregates**

STANDARDS: EN 1367-1 / CNR N° 80 / UNI 8520-20  
 BS 812:124 / ASTM C671, C682

**C313**

**Climatic chamber**, 700 litres capacity

Temperature range -25+70°C.  
 Humidity range 10 to 90%  
 With programmable test cycles.  
 Technical details and other models described in section "C"  
 Concrete pag. 276



**C348N \***

**Rock and masonry saw**

It accepts blades up to dia. 400 mm.  
 Useful cutting height: 115 mm

ACCESSORIES:

**C350-13** Diamond blade dia. 350 mm

**C352** Device to clamp cylinders and cores

**C353** Device to clamp irregular shaped specimens



\* NOTE:  
 Technical details and other saw models described in Section "C"  
 Concrete pag. 283

section A



## Determination of drying shrinkage TESTS OF THERMAL AND WEATHERING PROPERTIES OF AGGREGATES

STANDARDS: EN 1367-4 / BS 812:102

### A107

PRISM MOULD 50 x 50 x 200 mm, three gang, complete with steel inserts, to determine the thermal properties and the weathering of aggregates in drying shrinkage of concrete.

The test is developed on concretes of fixed mix proportions and aggregates of 20 mm max. size.

Weight: 8 kg



section A

58

SPARE PART:

**A107-11** Inserts for A107 mould. Pack of 12 pieces

## Determination of potential reactivity of alkali in aggregates for use in concrete

STANDARD: UNI 8520-22

### A101

PRISM MOULD, 25 x 25 x 280 mm, three gang, complete with six steel inserts to determine the dimensional variations of the specimen.

Steel made, Vickers hardness HV 400 approx.

Dimensions: 120 x 300 xh 35 mm

Weight: 4,5 kg



ACCESSORIES:

### A101-11

Spare steel inserts for A101 mould. Pack of 12 pieces.

### E087-06

TAMPER, hard wood made, to compact the specimen.

### ADDITIONAL ACCESSORIES

### E077 KIT

LENGTH COMPARATOR with dial indicator, 5 mm travel by 0,001 mm division mod. S375

See Catalogue section "E" pag. 321

AS AN ALTERNATIVE:

### E078 KIT

LENGTH COMPARATOR with digital dial indicator mod. S382-01, 12 mm travel by 0,001 mm divisions, complete with battery and RS232 connection to PC

### S382-13

Software, complete with USB adaptor and connection cable to PC as an alternative:

### E077-01KIT

LENGTH COMPARATOR with Digital Gauge 15,3 mm travel by 0,001 mm divisions mod. S382-02, complete with battery, but "without" RS232 port

**E078-01** Reference rod for A101 mould (UNI 8520-22)

**E078-06** Reference rod for A107 mould (UNI EN 1367-4)

E077 KIT + E078-01

E078 KIT + E078-06

E077-01 KIT



## Determination of resistance to thermal shock

### A023-01

### Muffle furnace | 1100°C. high capacity

STANDARD: EN 1367-5

Used for the determination of resistance to thermal shock of aggregates subject to heating and drying, in the production of hot bituminous mixtures.

The test is applied to heated and soaked aggregates at 700°C. for 180 seconds, and comparing the strength loss and loss in fines, obtained as per EN 1097-2 Spec. before and after the heating test.

The furnace is also suitable for general purpose laboratory tests

Technical data: see pag. 28

Power supply: 400V 3ph 50/60Hz 9Kw

ACCESSORIES:

**A107-20** TEST PLATE, metal, 440x240x4 mm with 12 mm rim

**A107-21** SUPPORT FRAME, for metal test plate.

**A107-22** PLATE, fire proof, 445x250x10 mm

**A107-23** FABRIC, stainless steel, size 445x250 mm, 2 mm cloth aperture



A023-01

**A109**

**Abrasimeter**

STANDARDS: EN 154 / EN ISO 10545-7

Suitable to determine the abrasion resistance of glazed tiles and other materials.

The instrument has three stations, and it can work either with wet (PEI) or dry (MCC) abrasive charges.

Eccentricity is 22,5 mm

Revolutions per minute are 300

Complete with cabinet to CE Safety Directive.

Power supply: 230V 50 Hz 1ph 300W

Dimensions: 400x700x500 mm

Weight: 38 kg



A109

**A115**

**Mohs' kit**

STANDARD: EN 101

Used for determining the hardness of the surface of the materials.

Composed by a case containing 9 minerals of the Moh's hardness scale and also copper strip, small glass and magnet bar.

Weight: 500 g



A115

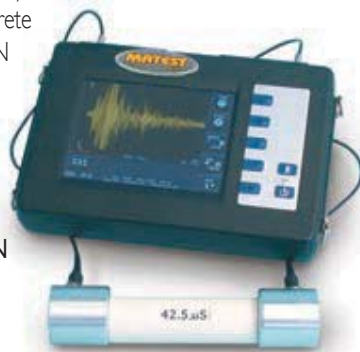
**Index of velocity of rocks:**

Ultrasonic pulse velocity tester.

See section "C" concrete

mod. C369N÷C372N

pag. 295 ÷ 296



C372N

**A122**

**Barton comb (profilometer) 300 mm length**

Used for the evaluation of the surface roughness of rock samples. This simple device allows to a myriad of very thin steel wires to perfectly lay to the outline of the sample under test, so to allow its analysis.

Dimensions: 300x120 mm

Weight: 1 kg



A122

**A122-01**

**Barton comb (profilometer) 150 mm length**

Same to mod. A122 but 150 mm long.



A122-01

A122-10

**A122-10**

**Tilt Test**

The instrument measures the roughness coefficient of a rock specimen or of a joint.

The sample is usually a rock core cut in half lengthwise, or a core placed on another two.

The unit is also designed to test the possible fluage tendency of bituminous mixtures covering a slope of a dam subject to high sun radiations.

The fluage tendency is the permanent viscous deformation of a material.

The apparatus consists of an inclined adjustable plane on which the sample is placed.

Inclination angle: 0 - 50°

Max. sample diameter: 100 mm

The plane is slowly tilted until sliding of the upper surface of specimen on the lower one occurs.

The roughness index can be evaluated from the measured inclination angle.

Dimensions: 270x175x265 mm.

Weight : 5 kg approx.



section A



A132

A132-01

**A132**

**Geological Hammer**, pointed tip, for preliminary rock identification. Weight 600 g approx.

**A132-01**

**Geological Hammer**, chisel edge, for preliminary rock identification. Weight: 400 g approx.

MATTEST



## A125N

### Digital point load tester (Rock strength index)

STANDARD: ASTM D5731

Used to determine the strength values of a rock specimen both in the field and in the laboratory.

It consists of a load frame for applying loads up to 55 kN, on which a manual hydraulic jack is mounted. The instrument accepts core specimens up to 4" (101,6 mm) diameter which are loaded by two coneshaped points. A graduated scale indicates the distance between the conical points.

The applied load is measured by a high precision electric load cell with a digital display unit range 0-56kN proving:

- 65.000 divisions
- 0,001 kN resolution
- Linearity: 0,05%
- Hysteresis: 0,03%
- Repeatability: 0,02%

The strength index (IS) is got by the formula  $P : D^2$  where P is the strength and D the space between the two conical points. Supplied complete with wooden carrying case, goggles, accessories.

Dimensions: 400x530x720 mm.

Weight: 25 kg



A125N

ACCESSORY:

**A125-02** Lower plate and upper plate with seat ball to modify the Point Load Tester into a portable compression tester (see section "C" concrete, mod. C094) pag. 249

SPARE-PART: **A125-01** Set of two hardened conical points.

## C381

### Rock classification Hammer

LOW IMPACT ENERGY MODEL

STANDARDS: ASTM D5873 / ISRM

This impact hammer is used for rock classification test. The core rock specimen normally NX 54,7 mm diameter is held on a special cradle (accessory) in horizontal position, and the hammer tests the same in all its length, to obtain an average of the readings.

Impact energy: 0,74 Nm

Measuring range: 10÷60 N/mm<sup>2</sup>

Weight: 2 kg

ACCESSORY:

## A121

### Rock cradle

STANDARD: ASTM D5873

To locate EX to NX core rock specimens during the classification tests by the Rock Hammer mod. C381. Weight: 20 kg

## C390

### Calibration anvil

STANDARDS: EN 12504-2 / ASTM D5873, C805

Used for periodical obligatory verification of the test hammers, as specified by EN Standards.

Technical data: see Section "C" Concrete pag. 292

Dimensions: dia. 150x 230 mm. Weight : 16 kg



C381

A121



C390



A125-02

## A095

### Polisher - Grinder

used for the preparation of rock and metallurgical specimens from lapping to final polishing. The disc is 200 mm diameter and the rotation speed is 300 rpm.

The machine is supplied complete with bakelite working disc and set of 25 abrasive silicon carbide discs.

Power supply: 230V 50 Hz 1ph 200W

Dimensions: 370x500x300 mm

Weight: 31 kg

SPARE PART:

## A095-01

ABRASIVE silicon carbide disc.

Pack of 25.



A095

**C298**

**Specimen grinding machine**

STANDARDS: EN 12390-3 / ASTM D4543 / UNI 6132

Designed to grind and polish cubic and cylindrical specimens of concrete, rocks, natural stones etc. having 350 mm. as max height. The specimens are fixed to the table by proper bolts, ensuring perfect coupling and blocking. The revolving abrasive head is radially and alternatively moved in both direction through an electric motor actuated by a push button.

The vertical movement of the grinding head has an accuracy of 0,05 mm.

The grinding machine is supplied complete with a collecting and water decantation tank, a motorpump, a large protection water-proof carter, eight abrasive charges. Supplied "without" locking stirrups and diamond grinding sectors to be ordered separately (see accessories).



C298 / C299

- Working base surface: 775x280 mm
- Grinding wheel: 330 mm. dia.
- Vertical span width: min. 70 mm max. 350 mm
- Power supply: 400V 3ph 50 Hz 4500 W
- Dimensions: 1220x1080x(h)1730 mm
- Weight: 410 kg

**C299**

**Automatic grinding machine**

Same to mod. C298, but the radial movement of the head is equipped with end of stroke system, granting the fully automatic displacement in both directions without activating the electric push button.

ACCESSORY:

**C300-02** DIAMOND GRINDING SECTOR (required quantity: 8 pieces), "particularly recommended" because of their long duration and good grinding action.

Additional accessories listed in Section "C" Concrete pag. 279

**C300-08**

**Core face preparation device**

Used in conjunction with the Grinding Machine, it prepares parallel and flat core faces of rock samples. The device accepts up to 4 core samples from 20 to 55 mm dia.

and can be mounted on most grinding machines.

Weight: 7 kg approx.



C300-08

**A130**

**Slake durability apparatus**

STANDARD: ASTM D4644

This equipment has been developed to assess the durability of rock to weakening and disintegration when subjected to the simulated effects of climatic slaking.

The rock samples are dried and then submitted to wear stress inside a drum which is rotated into water.

The test is performed different times and the wear is given by the loss in weight of the sample.

The system incorporates a motor drive unit mounted on a baseplate which revolves two (or up to four) stainless steel drums manufactured from 2 mm mesh, 140 mm dia. x 100 mm long.

The tanks are filled with water to a level 20 mm below the drum axis. A digital timer automatically stops the motor after the preset time.

The equipment is supplied complete with two drums with tanks, and it can accept two additional drums (see accessory).

Power supply: 230V 1ph 50Hz 250W

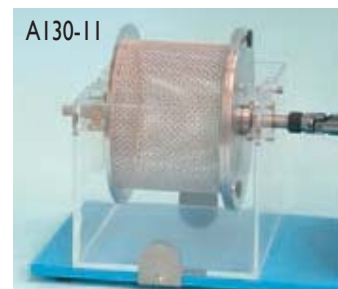
Dimensions: 350x740x300 mm approx.

Weight : 30 kg approx.



A130

A130-11



ACCESSORY:

**A130-11** MESH DRUM, complete with tank, base and accessories, to be connected to A130 unit.





### C377

#### Micro-coring equipment

STANDARD: UNI 10766

Extract a micro-core samples from a rock is an extremely valid non-destructive method, as it allows analysis and accurate evaluations (compression resistance, ecc.) without causing any damages, considering the dimension of the hole that can be eventually clogged with mortar.

Micro-coring system is ulteriorly valid and reliable if combined with ultrasonic tester and concrete hammer.

Micro-core extraction is easy, correct and requires the presence of one operator only.

The equipment comprises:

- Suitable electric drill. 230V 1F 50Hz
- Flanged guide assembly
- Drilling mask
- Impregnated diamond bit for cores with  $\varnothing 28 \times 100$  mm
- Impregnated diamond bit for cores with  $\varnothing 28 \times 200$  mm
- 2 Self-blocking pincers to fit the flanged guide assembly to the surface

Set of accessories comprising: anchors, bits, wrenches, screws.

Carrying case.

Dimensions: 550x400x200 mm approx

Weight: 10 kg. approx



C377

C377-01

ACCESSORIES:

#### C377-01

WATER TANK WITH FOOT PUMP, that leaves the hands of the operators free for coring

AS ALTERNATIVE:

#### C377-02

AIR-WATER PRESSURE TANK, 10 liters capacity

### C377-05

TRIMMING/CUT-OFF MACHINE FOR CORES.

Suitable to cut and trim cores to be prepared for compression tests, where the flatness of both surfaces is a basic condition to obtain correct results.

The equipment is made of stainless steel and aluminum and it is supplied complete with diamond blade dia. 180 mm.

For this purpose it must be used the drill mod. C377-10 (enclosed into micro-coring equipment) and the water tank with foot pump mod. C377-01.



C377-05

Note:

The maximum values foreseen for compression tests on micro-cores are usually lower than 60 kN.

Portable compression machine mod. C094

(see pag. 249), or a cement compression tester (see pag. 342) may be conveniently used.

Trimming of cores may be even obtained with the grinding machine mod. C298 + device mod. C300-08 (see pag. 279)



C377-02

SPARE PARTS:

**C377-10** ELECTRIC DRILL, suitable for the microcoring purposes.

**C377-15** DIAMOND BIT, dia. 28 x 100 mm

**C377-16** DIAMOND BIT, dia. 28 x 200 mm

**A129**

**Rock shear box apparatus**

STANDARDS: ASTM D5607\* / ISRM

Used to determine the strength and slope stability of rock size max 115x125 mm or cores max. dia. 102 mm, both in the field and in the laboratory.

Complete with two horizontal rams for shear in two directions, vertical loading ram, two bourdon tube load gauges dia. 150 mm with quick release couplings, calibrated 50 kN x 1 kN division, two hand pumps with hydraulic connections and dial gauge 25x0,01 mm.

Dimensions: 600x250x460 mm

Weight: 46 kg

ACCESSORY:

**A129-03\***

Set of 4 dial gauges 10 mm stroke x 0,002 mm division, complete with supports for vertical displacement measure, conforming to ASTM D5607 Standard.

**A131**

**Rock shear box apparatus**

**CYBER-PLUS 8 EVOLUTION ACQUISITION SYSTEM**

STANDARDS: ASTM D5607\* / ISRM

Same mechanical design as basic model A129, but equipped with: n° 2 Pressure transducers for load acquisition, connected to the pumps.

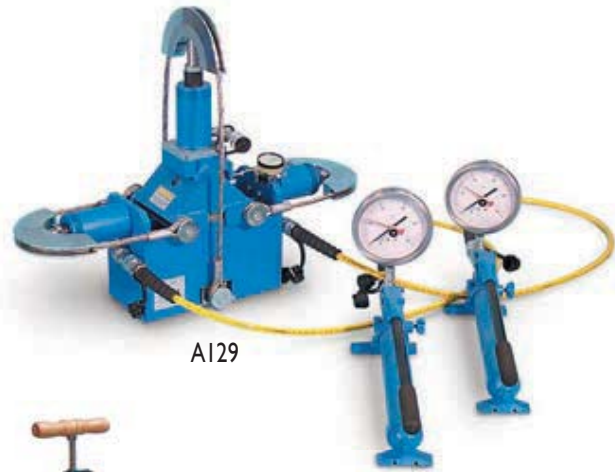
n° 1 Linear displacement transducer for shear measurement.

**C405-15N**

Cyber-Plus 8 Evolution "Touch-Screen" for data acquisition, visualization, processing and storing, directly connected to PC or printer. Technical details: see page 428

**S224-21N** Software for test data processing.

Weight: 50 kg approx.



A129



A129-01



A129-02



A129-03



A131 + A131-01

**A127**

**Cutting-off machine**

Enables rock or metal samples to be taken with cold smooth cuts, in compliance with metallographic specifications.

Blade dia. 200 mm suitable for cores up to 60 mm diameter.

Complete with cooling system, set of blades, precision clamp and specimen holder.

Power supply: 400V 3ph 50Hz 1,3kW (singlephase on demand)

Dimensions: 570x720x550 mm.

Weight: 75 kg



A127

ACCESSORY:

**A131-01\***

Set of 4 linear displacement transducers, complete with supports, for vertical displacement measure, conforming to ASTM D5607 Standard.

ACCESSORIES for A129 and A131:

**A129-01** MOULD FORMER, to prepare the specimen in the dimensions and geometry as requested by the shear box.

**A129-02** PRESSURE MAINTAINER, complete with pump, to absorb volume changes of the specimen and to allow a constant load to be maintained during the test.

**A129-04** British Gypsum Crystacal Plaster, for casting specimens into mould assembly, 25 kg bag.





**A150N  
ELASTIC MODULUS  
of rock specimens in  
uniaxial and triaxial  
tests**

A150N + C089-04N

**System:**

**Automatic with pace rate control also when releasing the load.**

STANDARDS: ASTM D7012 / UNI 9724-8 / ISRM  
UNE 22950-3

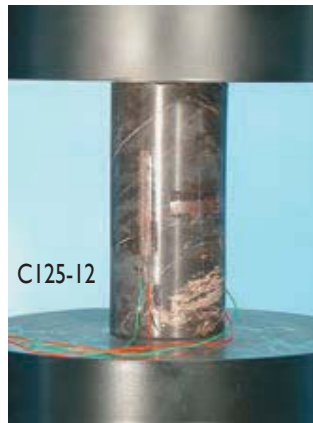
It can be used with a MATEST high stability frame with capacity of, 2000, or 3000 kN coupled to the Automatic Servo-controlled system "Servo-Plus Evolution" (mod. C104N).

The appliance includes:

- **Hydraulic system**

It is an hydraulic installation and has a high performance valve directly controlled by the digital unit that grants the automatic control of the pace rate increasing the load, keeps a certain load and than controls the pace rate decreasing the load.

The setting of the pace rate is made by a very sensitive valve controlled by a step by step motor that allows a micrometric action on the pace rate granting excellent results in the control of the load. A laser position detector allows a rapid positioning of the piston and a very accurate touch point. This grants a touching sensitivity of test starting of about 0.1 per thousand of the maximum capacity. When used in conjunction with the C104NLP (see page 66) for the application of the side pressure, the hydraulic system permits to maintain the pre-load level with extremely high accuracy.



- **Electronic measuring system**

The high performance control and data processing unit controlled by a 32 bit microprocessor; can manage up to 8 high resolution channels for the control of load cells or transducers with strain gages bridge.

The unit contains two Analogical/Digital last generation converters with 24 bits resolution. The system processes the signals coming from the load cells and from the extensometers giving all the results required for a further processing following the most updated standards for this application.





• **Data acquisition and processing software UTM2 (Universal Testing machine 2) with License for Elastic Modulus on Rocks.**

The software has been developed on the working line of the already known software UTM-2 (windows menu). It contains the profiles of the main Standards used, but the user can modify as he likes and personalise the test profile, that will be effected in a completely automatic way by the testing machine.

The user must introduce a list of dates concerning the specimen that will be tested and the kind of test that he wants to make: shape of the specimen (cylinder-cube-block), dimensions, age of the specimen, average expected breaking value, etc... The appliance allows verifying the proper reading of the extensometers and, if everything is within the expected tolerances, it manages the average deformation value read by the transducers and processed by the digital unit, than it transmits by means of the serial communication port RJ45 (Network Connection) to a Personal Computer; that can be already by the end user or supplied separately (not included with the Software), all the dates of the test. These dates will be processed by the software and transformed in a graph load/deformation and load/time, following the specific Standards.

The software gives the possibility to print on a standard printer a test certificate reporting all the dates concerning the test and the specimen and the graph of the test. The software includes the license "Servonet" mod. C123N. The extensometers (proposed in two versions: **A** and **B**) are not included in the supply and must be ordered separately (see accessories).

ACCESSORY:

**A150-01N**

Software to make Secant Compression Elastic Modulus tests on concrete

STANDARDS: UNI 6556 / ASTM C469 / ISO 6784 / DIN 1048

NOTE:

The Elastic Modulus of Rocks mod. A150N must be used together with:

A) Extensometers (strain gages), single use, electric (obliged model to perform tests with Hoek cells), available in different sizes,

or:

B) Extensometers/Compressometers, electronic, universal, mechanical frame,

which are not included in the standard supply and have to be ordered separately (see accessories)



ACCESSORIES:

A) **ELECTRIC SINGLE USE EXTENSOMETERS**, pack of 10 pieces

Available models:

**C125-10** Electric extensometer, base length 10 mm.

**C125-11** Electric extensometer, base length 20 mm.

**C125-12** Electric extensometer, base length 30 mm.

**C125-13** Electric extensometer, base length 60 mm.

**C125-14** Electric extensometer, base length 120 mm.

**C125-15**

KIT for the application of single use extensometers composed by: glue, welder, solder, cleanins liquid, accessories, the whole in carrying case

**C125-09**

INTERFACE MODULE, "needed accessory" to connect up to 4 electric single use extensometers. This module allows also the automatic calibration of the zero and of the measuring range after a special thermal compensation. This grants a five times better accuracy than the one requested by the Standards.



AS AN ALTERNATIVE:

B) **C134**

EXTENSOMETER / COMPRESSOMETER, electronic, universal, mechanical frame.

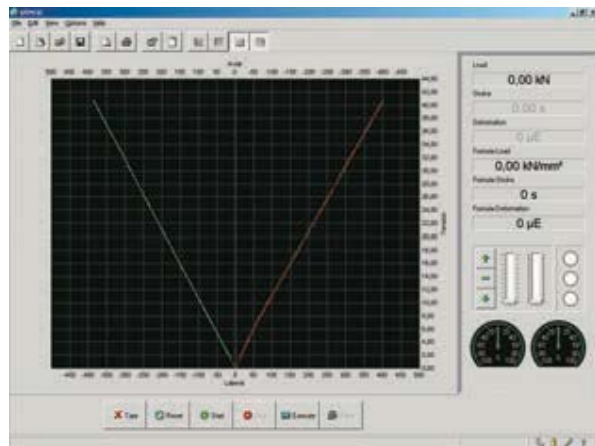
Technical details: see pag. 222



C134

**C134-10**

TEMPLATE, to regulate and calibrate the base length of the C134 extensometer



Typical screen shown while a test is made representing the longitudinal and transversal deformations.

#	n°	Name	Symbol	Value	Unit
1	1	Load deformation n°1	load	193.8	µE
1	2	Load deformation n°2	load	308.2	µE
1	3	Diametral deformation n°1	µE	194.6	µE
1	4	Diametral deformation n°2	µE	305.3	µE
1	5	Axial tension n°1	µE	25.489	kN/m²
1	6	Axial tension n°2	µE	32.738	kN/m²
1	7	Diametral tension n°1	µE	25.489	kN/m²
1	8	Diametral tension n°2	µE	32.738	kN/m²
1	9	Maximum tension	µE	40.912	kN/m²
1	10	Axial modulus	µE	0.107	kN/m²/µE
1	11	Diametral modulus	µE	0.1	kN/m²/µE
1	12	Poisson ratio	v	-0.273	

Test data

## TRIAXIAL TESTS ON ROCK SPECIMENS

STANDARDS: ASTM D7012 / EN 1926, EN 14580

The triaxial test is made on a rock specimen placed into a container (Hoek cell), closed into a latex membrane .

The specimen receives an axial load and a constant isotropic pressure normally between 5 and 6 Mpa for the whole test.

The electric extensometers are directly applied on the surface of the rock specimen and they are used for the automatic reading in real time of the different parameters and find different information as:



Radial deformation combined with the axial deformation to obtain the Poisson value.

Stress value in relation with the axial and radial deformation.

The maximum or breaking value.

Tangent and secant Young's modulus measured on the axial deformation curve.

Maximum stress value in triaxial conditions.

For this reason it is recommended the use of a compression load frame with capacity of 1500, 2000 or 3000 kN (see concrete sector) combined with the automatic servo-controlled system "Servo-Plus Evolution" model C104N and to the automatic system for the Elastic Modulus on rocks model A150N, that includes the data acquisition and processing software.

The side pressure set by the user, is kept constant between  $\pm 1\%$  using:

### C104N LP

Automatic servo-controlled system "Servo-Plus Evolution" that grants a setting of the pressure up to 70 Mpa.

ACCESSORY:

### C104-51 LP

DISCHARGE CIRCUIT UPGRADE FOR C104N LP

Suitable when rocks causing fast cell pressure increment are tested.

This circuit upgrades C104N LP to a more powerful lateral pressure compensation.

The standards require that during the compression test the load on the rock specimen is applied in a continue way in order to obtain the breaking of the specimen within a time included between 5 and 10 minutes, with a constant increase of the load included between 0,5 and 1,0 Mpa/second.



C089-04N + A150N

C104N LP



**Hoek cells for rock triaxial tests**

For use with pressures up to 70 MPa.

Used to measure the strength of cylindrical rock specimens which are subjected to triaxial compression.

The basic Hoek cell consists of the following:

Cell body complete with two screwed end caps and two self-sealing couplings, two spherical seats and pistons, hardened and ground, one specimen jacket.

A137 - A139



MODELS:

	Specimen Dia. x height	Size	Load spreader pads (pair)	Spare spherical seat + piston	Spare Jacket	Core drilling barrel 200 mm long	Adaptors set for extruder
<b>A137</b>	38,10x 75 mm	1,5"	<b>A136-01</b>	<b>A137-02</b>	<b>A137-03</b>	<b>A137-04</b>	<b>A141-02</b>
<b>A138</b>	42,04x 85mm	BX	<b>A136-01</b>	<b>A138-02</b>	<b>A138-03</b>	<b>A138-04</b>	<b>A141-03</b>
<b>A139</b>	54,74x100mm	NX	<b>A136-01</b>	<b>A139-02</b>	<b>A139-03</b>	<b>A139-04</b>	<b>A141-04</b>

NOTE: The load spreaders A136-01 are used to avoid the cell's pistons engrave the platens of the compression machine.  
One set of extruder adaptors is formed by back plate, tamper and cell body support.

**A147**

**Compression device for rock cores**

STANDARD: ASTM D2938

Used to perform compression tests on rock core specimens having max. diameter 55 mm and height between 95 to 110 mm. The loading piston is sustained by two springs; the upper compression platen is fitted with a spherical seat; the lower platen is fitted to the base.

Piston's stroke: 20 mm - Platens diameter: 55 mm

Vertical daylight: max. 112 mm, min. 92 mm - Platens hardness: 60 HRC

Overall dimensions: dia. 151 by height 249 mm

Weight: 10 kg approx.



**A140-01**

**Coring machine** used in the laboratory, to obtain cores from irregular rock samples. To be used with the Core Drilling Barrels (accessory A137-04÷A139-04).

The 2 speed electric motor 1140/2040 rpm at free load and 730/1340 rpm at max load, is equipped with friction device and double safe isolation to CE Directive.

Complete with specimen's clamp device, water cooling system and water tank.

Power supply: 230V 50/60 Hz 1ph 1800W

Weight: 60 kg approx.



**A141**

**Extruder**

Used to eject the rock sample from the rubber jacket, avoiding to empty the confining fluid.

Supplied without adaptors to be ordered separately (see table). Weight: 12 kg



section A



## A142N

### Hydraulic constant isotropic cell pressure system

The unit consists of a hand operated pump, complete with precision pressure gauge supplying pressures up to 35 MPa, complete with reservoir and connections, providing all round pressure source to the Hoek Cell.

Weight: 18 kg



A142N + A129-02

ACCESSORY:

### A129-02

Pressure maintainer; complete with pump, to allow a constant load to be maintained during the test.



A138-05

A137-05

### Permeability of rock with Hoek cells

To measure the permeability or flow of water through a rock specimen with a controlled water pressure system.

The Hoek Cells can be equipped with the (optional) End Caps, screwed to the body.

The set consists of the upper and lower End Cap, complete with distance block.

MODELS:

**A137-05** Specimen dia. 38,10 mm

**A138-05** Specimen dia. 42,04 mm

**A139-05** Specimen dia. 54,74 mm

### S275

**Permeability attachment**, mounted on tripod, to be connected to the End Cap of the Hoek Cell. Burette 50 ml capacity and 0,1 ml div.

ACCESSORY:

### S325

Nylon opaque tubing. Pack of 25 mt.

## A144

### Permeability constant oil/water pressure system

Providing an infinitely variable constant pressure from 0 to 3500 kPa. To be used with the Hoek Cell equipped with Permeability End Caps and Permeability Attachment.

The system consists of a motor hydraulic pump, oil/water vessel, piston/spring device, 10 litres of viscosity oil.

The unit is supplied complete with precision pressure gauge 0 - 3500 kPa range.

Power supply: 230V 50 Hz 1ph

Weight: 20 kg



S275

A137-05

A137

A144

