



# Section A

## AGGREGATES - ROCKS

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 new European Standards EN 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.



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## GENERAL PURPOSE LABORATORY DRYING OVENS

Natural convection, analogue thermoregulator-indicator.

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 an analogue thermoregulator-indicator.

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 + A006-08

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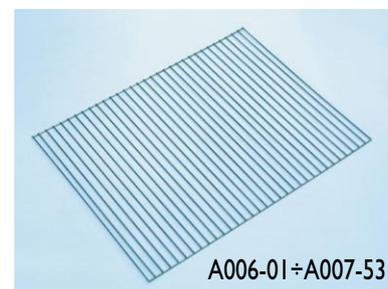


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Model	Capacity litres	Inside dimensions mm			Outside dimensions mm			Doors n°	Wattage	Weight Kg	Spare grid shelf
		L	D	H	L	D	H				
<b>A007</b>	50	350	360	390	590	460	620	1	750	34	<b>A006-01</b>
<b>A007-01</b>	100	400	420	600	640	515	805	1	1200	40	<b>A007-51</b>
<b>A007-04</b>	220	600	610	600	840	725	805	1	2000	60	<b>A007-52</b>
<b>A007-08</b>	440	900	700	700	1140	815	905	2	3600	85	<b>A007-53</b>



A007-01 + A006-08



A006-01 + A007-53

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 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



A008-07

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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</b>	100	400	420	600	700	515	910	1	1250	45	<b>A008-51</b>
<b>A008-03</b>	220	600	610	600	900	725	910	1	2050	70	<b>A008-52</b>
<b>A008-05</b>	440	900	700	700	1220	805	1010	2	3700	95	<b>A008-53</b>
<b>A008-07</b>	720	1000	600	1200	1330	715	1555	2	4950	140	<b>A008-54</b>



A008-07



A008-51 ÷ A008-54

ACCESSORY:

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



## Muffle furnaces

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

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. The furnace 1200°C. capacity meets EN 196-2, 196-21, 459-2 Standards and is used to determine the loss on ignition of cement and lime; chloride, carbon dioxide, alkali content of cement.

Inside dimensions: 210x320x150 mm

Outside dimensions: 510x750x660 mm

Weight: 88 Kg approx.



A022

## A009

### Microwave oven

Used for speed drying purposes, moisture determination, conditioning.

Power supply: 220-240V 50 Hz 1ph 700W

Internal dimensions: 380 x 340 x 300 mm approx.

Weight: 28 Kg



A009

Models	Temperature max	Power supply	Wattage
A022	1100°C.	220-240V 50-60 Hz 1F	3900
A023	1100°C.	400V 50-60 Hz 3F	3900
A024	1200°C.	220-240V 50-60 Hz 1F	4200

## Chloride content, Rapid Method

STANDARDS: BS 812, 1377

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.



A024

## 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

see section "V" General equipment



V200

V200-01

## 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

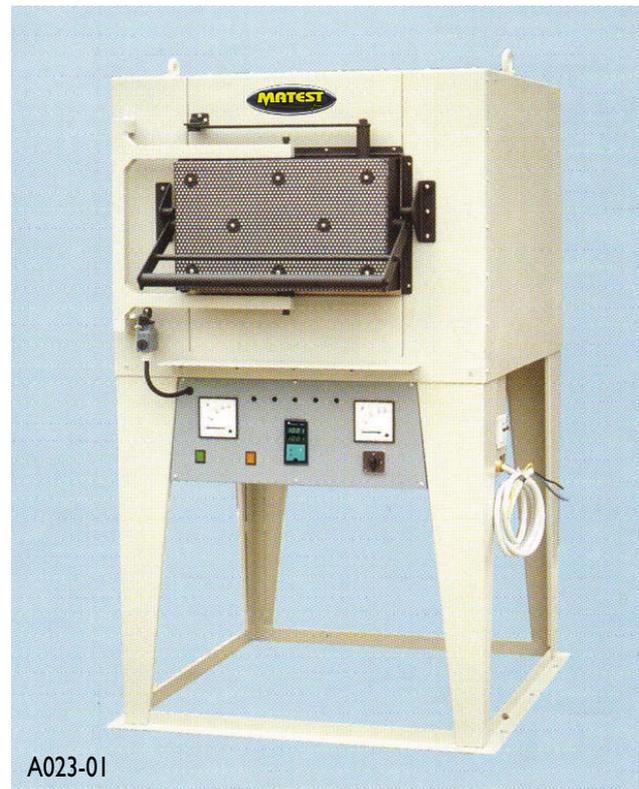
Max. temperature: 1100°C.

Inside dimensions (wxdxh): 300x500x220 mm

Overall dimensions: 750x1100x1650 mm

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

Weight: 400 kg



A023-01



A073

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

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

## 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.

### Lightweight aggregates.

### Crushing resistance determination

STANDARD: EN 13055-1

## A081-01

Apparatus for the determination of the crushing resistance of lightweight aggregate, composed by: ring with adjustable height, upper and lower cylindrical piston, base.

Made of steel, plated against corrosion.

Dimensions: 180 mm dia. by 260 mm height

Weight: 15 kg approx.



A081-01





## “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. The quantity of gas formed is directly proportional to the water present, and is indicated on a built-in-pressure gauge that is calibrated in percentage of moisture. Complete with small balance, reagent tin, accessories; the whole self-contained in a portable wooden case.

MODELS:

**A025** SPEEDY Moisture tester 6 grams capacity.  
Moisture range: 0 - 20%  
Weight: 6 Kg

**A026** SPEEDY Moisture tester 20 grams capacity.  
Moisture range: 0 - 20%  
Weight: 8 Kg



A025

SPARE PART:

**A027-01** Moisture tester reagent (one-pound tin)

A026

ACCESSORY:

**A027-11**

Speedy calibration kit



A028-02

## A028

### Standard moisture tester

For the rapid and accurate determination of inherent humidity in sand, gravel, soil etc. according to the carbide method.

Sample weight: from 10 to 100 g. of material.

Moisture range: 0 - 15%

Supplied complete with 20 carbide ampoules, small balance, accessories, self-contained. Weight: 5 kg



A028

## A028-01

### Digital moisture tester

Same to mod. A028, but with digital manometer for more accurate readings (0,1%) with pressure and temperature display.

Supplied complete.



A028-01

## A028-02

### Digital moisture tester with printer

Same to mod. A028, but with high precision digital manometer for more accurate readings (0,1%) with pressure, temperature and test time display. Complete with printer to obtain test certificate, accessories, metallic carrying case.

Dimensions: 520x340x140 mm

Weight: 8 kg

SPARE-PART:

**A028-11**

Carbide Ampoules (pack of 100)



A028-11



**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



**Desiccators borosilicate glass**

Complete with perforated plate

MODELS:

- A035** Dia. 200 mm
- A036** Dia. 250 mm
- A036-01** Dia. 300 mm
  
- A039** Dia. 200 mm with vacuum
- A040** Dia. 250 mm " "
- A040-01** Dia. 300 mm " "

ACCESSORY:

**V300-15**

**Desiccators salts** Silica gel box 1000 g

**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%  
 Temperature range: -20°C. to +60°C. accuracy 0,5°C.  
 Battery: 4x1.5V AA cells  
 Dimensions: 120x120x1200 mm  
 Weight: 2 Kg



**A030**

**Reaction container**

STANDARDS: ASTM C289 - UNI 8520-22

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



**Moisture determination balance**

See section "V" General Equipment





## Bar (grid) sieves for aggregate flakiness index and particle shape

STANDARDS: EN 933-3  
UNI 8520 - NF P18-561

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. Weight: 4 Kg each sieve.



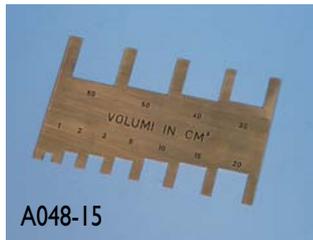
A048

### 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

### 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:

**A049** Complete set of n°7 flakiness sieves  
Weight: 15 Kg

Model	Slot width mm	Slot length mm
A049-01	4,9	30
A049-02	7,2	40
A049-03	10,2	50
A049-04	14,4	60
A049-05	19,7	80
A049-06	26,3	90
A049-07	33,9	100

**A048** Complete set of 13 bar sieves from 2,5 (A048-01) to 40 mm (A048-13) slot width

MODEL:

**A048-01** slot width 2,50 mm

**A048-08** slot width 12,50 mm

**A048-02** slot width 3,15 mm

**A048-09** slot width 16,00 mm

**A048-03** slot width 4,00 mm

**A048-10** slot width 20,00 mm

**A048-04** slot width 5,00 mm

**A048-11** slot width 25,00 mm

**A048-05** slot width 6,30 mm

**A048-12** slot width 31,50 mm

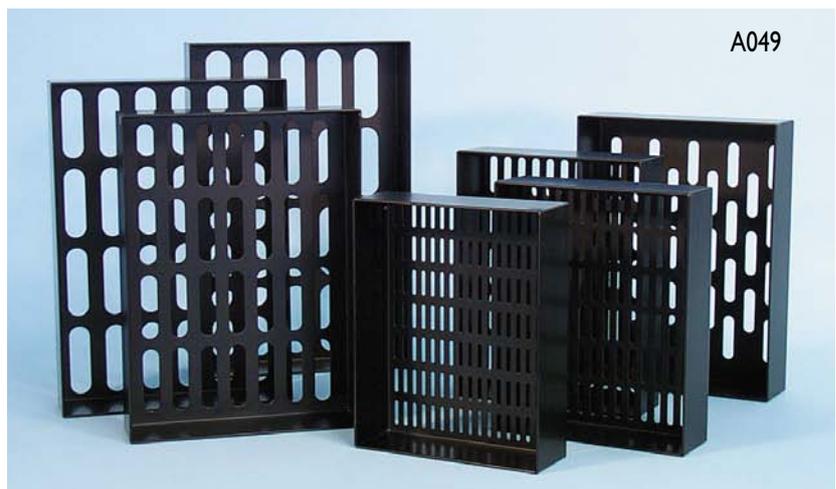
**A048-06** slot width 8,00 mm

**A048-13** slot width 40,00 mm

**A048-07** slot width 10,00 mm

**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.

**A048-16** Bar grid Sieve, slot width 7,2 mm  
STANDARD: EN 1097-8  
Used to retain the road aggregates in the accelerated polishing machine tests.



A049

## Test sieves

STANDARDS: ASTM E 11 - AASTHO T27 - BS 410 - NF X11-504 - ISO 3310 - DIN 4187/1 - EN 933-1, 933-2 - UNI 2331, 2333 - 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".

### HOW TO BUY WOVEN WIRE MESH SIEVES

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"



A052-...

### HOW TO BUY PERFORATED PLATE SIEVES, "Square Hole"

STANDARDS: ASTM E11 - BS 410 - ISO 3310 - DIN 4187/1  
EN 933-2

The available openings of the perforated plate square hole sieves are listed in the next page, and are coded from n° 01 to 31

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: 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.

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.



A031-...



A037-...

### 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 33

The buyer has to add to this number:

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

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



# Aggregates - Rocks

Table for the woven wire mesh sieves:

Aperture Size mm	ASTM Number	Frame Dia. 200 mm	Frame Dia. 8"	Frame Dia. 300 mm	Frame Dia. 400 mm	Frame Dia. 450 mm
0,038	400	A052-01	A050-01	A053-01	A055-01	A044-01
0,040	-	A052-02	A050-02	A053-02	A055-02	A044-02
0,045	325	A052-03	A050-03	A053-03	A055-03	A044-03
0,050	-	A052-04	A050-04	A053-04	A055-04	A044-04
0,053	270	A052-05	A050-05	A053-05	A055-05	A044-05
0,063	230	A052-06	A050-06	A053-06	A055-06	A044-06
0,075	200	A052-07	A050-07	A053-07	A055-07	A044-07
0,080	-	A052-08	A050-08	A053-08	A055-08	A044-08
0,090	170	A052-09	A050-09	A053-09	A055-09	A044-09
0,100	-	A052-10	A050-10	A053-10	A055-10	A044-10
0,106	140	A052-11	A050-11	A053-11	A055-11	A044-11
0,125	120	A052-12	A050-12	A053-12	A055-12	A044-12
0,150	100	A052-13	A050-13	A053-13	A055-13	A044-13
0,160	-	A052-14	A050-14	A053-14	A055-14	A044-14
0,180	80	A052-15	A050-15	A053-15	A055-15	A044-15
0,200	-	A052-16	A050-16	A053-16	A055-16	A044-16
0,212	70	A052-17	A050-17	A053-17	A055-17	A044-17
0,250	60	A052-18	A050-18	A053-18	A055-18	A044-18
0,300	50	A052-19	A050-19	A053-19	A055-19	A044-19
0,315	-	A052-20	A050-20	A053-20	A055-20	A044-20
0,320	-	A052-21	A050-21	A053-21	A055-21	A044-21
0,355	45	A052-22	A050-22	A053-22	A055-22	A044-22
0,400	-	A052-23	A050-23	A053-23	A055-23	A044-23
0,425	40	A052-24	A050-24	A053-24	A055-24	A044-24
0,500	35	A052-25	A050-25	A053-25	A055-25	A044-25
0,600	30	A052-26	A050-26	A053-26	A055-26	A044-26
0,630	-	A052-27	A050-27	A053-27	A055-27	A044-27
0,710	25	A052-28	A050-28	A053-28	A055-28	A044-28
0,800	-	A052-29	A050-29	A053-29	A055-29	A044-29
0,850	20	A052-30	A050-30	A053-30	A055-30	A044-30
1,000	18	A052-31	A050-31	A053-31	A055-31	A044-31
1,180	16	A052-32	A050-32	A053-32	A055-32	A044-32
1,250	-	A052-33	A050-33	A053-33	A055-33	A044-33
1,400	14	A052-34	A050-34	A053-34	A055-34	A044-34
1,600	-	A052-35	A050-35	A053-35	A055-35	A044-35
1,700	12	A052-36	A050-36	A053-36	A055-36	A044-36
2,000	10	A052-37	A050-37	A053-37	A055-37	A044-37
2,360	8	A052-38	A050-38	A053-38	A055-38	A044-38
2,500	-	A052-39	A050-39	A053-39	A055-39	A044-39
2,800	7	A052-40	A050-40	A053-40	A055-40	A044-40
3,150	-	A052-41	A050-41	A053-41	A055-41	A044-41
3,350	6	A052-42	A050-42	A053-42	A055-42	A044-42
4,000	5	A052-43	A050-43	A053-43	A055-43	A044-43
4,750	4	A052-44	A050-44	A053-44	A055-44	A044-44
5,000	-	A052-45	A050-45	A053-45	A055-45	A044-45
5,600	3,5	A052-46	A050-46	A053-46	A055-46	A044-46
6,350	1-4"	A052-47	A050-47	A053-47	A055-47	A044-47
6,700	0,265"	A052-48	A050-48	A053-48	A055-48	A044-48
7,100	-	A052-49	A050-49	A053-49	A055-49	A044-49
8,000	5-16"	A052-50	A050-50	A053-50	A055-50	A044-50

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Aperture Size mm	ASTM Number	Frame Dia. 200 mm	Frame Dia. 8"	Frame Dia. 300 mm	Frame Dia. 400 mm	Frame Dia. 450 mm
9,500	3-8"	A052-51	A050-51	A053-51	A055-51	A044-51
10,0	-	A052-52	A050-52	A053-52	A055-52	A044-52
11,2	7-16"	A052-53	A050-53	A053-53	A055-53	A044-53
12,5	1-2"	A052-54	A050-54	A053-54	A055-54	A044-54
13,2	0,530"	A052-55	A050-55	A053-55	A055-55	A044-55
14,0	-	A052-56	A050-56	A053-56	A055-56	A044-56
16,0	5-8"	A052-57	A050-57	A053-57	A055-57	A044-57
19,0	3-4"	A052-58	A050-58	A053-58	A055-58	A044-58
20,0	-	A052-59	A050-59	A053-59	A055-59	A044-59
22,4	7-8"	A052-60	A050-60	A053-60	A055-60	A044-60
25,0	-	A052-61	A050-61	A053-61	A055-61	A044-61
25,4	1"	A052-62	A050-62	A053-62	A055-62	A044-62
26,5	1,06"	A052-63	A050-63	A053-63	A055-63	A044-63
28,0	-	A052-64	A050-64	A053-64	A055-64	A044-64
31,5	1 1-4"	A052-65	A050-65	A053-65	A055-65	A044-65
37,5	1 1-2"	A052-66	A050-66	A053-66	A055-66	A044-66
40,0	-	A052-67	A050-67	A053-67	A055-67	A044-67
45,0	1 3-4"	A052-68	A050-68	A053-68	A055-68	A044-68
50,0	2"	A052-69	A050-69	A053-69	A055-69	A044-69
53,0	2,12"	A052-70	A050-70	A053-70	A055-70	A044-70
63,0	2 1-2"	A052-71	A050-71	A053-71	A055-71	A044-71
75,0	3"	A052-72	A050-72	A053-72	A055-72	A044-72
80,0	-	A052-73	A050-73	A053-73	A055-73	A044-73
90,0	3 1-2"	A052-74	A050-74	A053-74	A055-74	A044-74
100,0	4"	A052-75	A050-75	A053-75	A055-75	A044-75
106,0	4,24"	A052-76	A050-76	A053-76	A055-76	A044-76
125,0	5"	A052-77	A050-77	A053-77	A055-77	A044-77

## Table of the perforated plate sieves, "square holes"

STANDARDS: EN 933:1, 933:2 - BS 410 - DIN 4187-1 - ISO 3310 - ASTM E11

Aperture Size mm	Frame Dia. 200 mm	Frame Dia. 300 mm	Frame Dia. 400 mm	Aperture Size mm	Frame Dia. 200 mm	Frame Dia. 300 mm	Frame Dia. 400 mm
4,00	A031-01	A032-01	A033-01	20,0	A031-17	A032-17	A033-17
4,75	A031-02	A032-02	A033-02	22,4	A031-18	A032-18	A033-18
5,00	A031-03	A032-03	A033-03	25,0	A031-19	A032-19	A033-19
5,60	A031-04	A032-04	A033-04	26,5	A031-20	A032-20	A033-20
6,30	A031-05	A032-05	A033-05	28,0	A031-21	A032-21	A033-21
6,70	A031-06	A032-06	A033-06	31,5	A031-22	A032-22	A033-22
7,10	A031-07	A032-07	A033-07	37,5	A031-23	A032-23	A033-23
8,00	A031-08	A032-08	A033-08	45,0	A031-24	A032-24	A033-24
9,50	A031-09	A032-09	A033-09	50,0	A031-25	A032-25	A033-25
10,0	A031-10	A032-10	A033-10	53,0	A031-26	A032-26	A033-26
11,2	A031-11	A032-11	A033-11	63,0	A031-27	A032-27	A033-27
12,5	A031-12	A032-12	A033-12	75,0	A031-28	A032-28	A033-28
13,2	A031-13	A032-13	A033-13	90,0	A031-29	A032-29	A033-29
14,0	A031-14	A032-14	A033-14	100	A031-30	A032-30	A033-30
16,0	A031-15	A032-15	A033-15	106	A031-31	A032-31	A033-31
19,0	A031-16	A032-16	A033-16	125	A031-32	A032-32	A033-32

**Table of the perforated plate sieves, "round holes" STANDARD: UNI 2334**

section A



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Aperture Size mm	Frame Dia. 200 mm	Frame Dia. 300 mm	Aperture Size mm	Frame Dia. 200 mm	Frame Dia. 300 mm
4	A037-01	A038-01	28	A037-19	A038-19
4,75	A037-02	A038-02	31,5	A037-20	A038-20
5	A037-03	A038-03	35,5	A037-21	A038-21
5,6	A037-04	A038-04	40	A037-22	A038-22
6,3	A037-05	A038-05	45	A037-23	A038-23
7,1	A037-06	A038-06	50	A037-24	A038-24
8	A037-07	A038-07	53	A037-25	A038-25
9	A037-08	A038-08	56	A037-26	A038-26
10	A037-09	A038-09	63	A037-27	A038-27
11,2	A037-10	A038-10	71	A037-28	A038-28
12,5	A037-11	A038-11	75	A037-29	A038-29
13,2	A037-12	A038-12	80	A037-30	A038-30
14	A037-13	A038-13	90	A037-31	A038-31
16	A037-14	A038-14	100	A037-32	A038-32
18	A037-15	A038-15	106	A037-33	A038-33
19	A037-16	A038-16	112	A037-34	A038-34
20	A037-17	A038-17	125	A037-35	A038-35
25	A037-18	A038-18			

Different hole apertures available upon request

## Wet washing sieves

STANDARD: ASTM E11

Stainless steel frame and cloth having 0,074 mm opening (ASTM N. 200)

Models:

**A045** Dia. 200 mm by 200 mm height

**A045-01** Dia. 200 mm by 100 mm height



A045

**V179** Bristle Brush, soft hair, 35 mm dia

**V179-02** Double ended, brass and nylon bristle

**V179-03** Double ended soft/hard nylon

**V179-05** Soft hair Brush, 3 mm dia. BS 812

**V179-06** Hard nylon sieve Brush, flat 60 mm



V179

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>A046-12</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>



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>



A058 + A059-03

## A058 Noise reduction cabinet

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



A058-01

## 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.

## A060 Sieve shaker motor operated for sieves dia. 200 mm and 8"

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

Provided of timer 0-60 minutes.

Power supply 220-240V 50 Hz 1ph 110W

Dimensions: 320x380x800 mm

Weight: 20 Kg approx.



A060



A060-01

## A060-01 Sieve shaker motor operated

Basically similar to mod. A060 it accepts sieves dia. 200 - 250 - 300 315 mm - 8" - 12".

The shaker can hold up to 8 sieves dia. 200 mm or 7 sieves dia. 300 mm, and to perform also wet sieving tests (see accessory mod. A046 - A047)

Power supply 220-240V 50 Hz 1ph 110W

Dimensions: 350x400x950 mm

Weight: 24 Kg approx.





## Electromagnetic sieve shaker

This Sieve Shaker is activated by electromagnetic impulses and thanks to its triple vibrating action (vertical, lateral and rotational) it is recommended to perform sieving tests where high precision and performance are important, and where continual and intense uses are required. It is therefore suggested for accurate sieving tests, also on fine materials.

This Electromagnetic Shaker is of simple and sturdy construction, can hold up to 10 sieves and it is also suitable for wet sieving tests (accessory mod. A046, A047).

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: 220-240 V 50/60 Hz 1ph 450/750W



A059-02

A059-01



MODELS:

### A059-01 Electromagnetic sieve shaker

for sieves dia. 200 and 8"  
Dimensions: 320x380x850 mm  
Weight: 40 Kg

### A059-02 Electromagnetic sieve shaker

for sieves dia. 200 - 250 - 300  
- 315 mm - 8" - 12"  
Dimensions: 380x440x1080 mm  
Weight: 65 Kg



A059-03

A059-04

### A059-03 Electromagnetic sieve shaker

for sieves dia. 200 - 250 - 300 - 315 - 350 - 400 mm - 8" - 12"  
Dimensions: 430x460x1150 mm  
Weight: 80 Kg

### A059-04 Electromagnetic sieve shaker

for sieves dia. 200 - 250 - 300 - 315 - 400 - 450 mm - 8" - 12" - 18"  
Dimensions: 480x500x1150 mm  
Weight: 85 Kg

## A061 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. Power supply: 220-240V 50 Hz 1ph 750 W  
Dimensions: 585x790x850 mm  
Weight: 180 Kg approx.

### A061-01 High capacity sieve shaker

Same to mod. A061, but equipped with safety device to 89/392/CEE Directive.

### A061-02 High capacity sieve shaker

Same to mod. A061, but complete with steel cabinet with microswitch to 89/392/CEE Directive lined with sound-proofing material for noise reduction.

ACCESSORIES:

**A061-04** Dust cover

**A061-03 Tray** only, without mesh, size 457x660x75 mm for mesh openings from 125 to 6,3 mm.

**A061-05 Tray** only, without mesh, size 457x660x75 mm for mesh openings from 5,6 to 1 mm.

**A061-06 Tray** only, without mesh, size 457x660x75 mm for mesh openings from 0,85 to 0,063 mm.

**A061-07 ÷ A061-31**

**Screen Tray**, fine mesh, reinforced, size 457x660x75 mm, aperture from 0,075 to 1 mm (when ordering please specify screen aperture: see table page 30).



A061 with Screen Trays

section A



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**A061-32 ÷ A061-77**

**Screen Tray**, Coarse Serie size 457x660x75 mm, aperture from 1,18 to 125 mm (when ordering please specify screen aperture: see table pages 30-31).



A061-01



A061-02 with Screen Trays



A062

## Sample splitters

STANDARDS: EN 932-1 - ASTM C136 - NF P18-553 - UNI 8520  
AASHTO T27, T87 - BS 812 - 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, it is supplied with two collecting pans.

Models	Material Steel	Slot width	Slot Number	Weight Kg	Spare collecting pan
A062	Stainless	1-4" - 6,3 mm	12	1	A062-02
A063	Stainless	1-2" - 12,7 mm	12	3	A063-02
A064	Painted	3-4" - 19 mm	12	5	A064-02
A065	"	1" - 25,4 mm	12	8	A065-02
A065-01	"	1 1-2" - 38 mm	8	9	A065-03
A066	"	2" - 50,8 mm	8	13	A066-02
A067	"	2 1-2" - 63,5 mm	8	15	A067-02

section A



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A064



A068

## A068

### Large capacity sample splitter

STANDARDS: ASTM C702 - EN 932-1 - UNI 8520  
UNE 83120 - NF P18-553

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 cadmium plated for rust protection.

Weight: 55 Kg

SPARE-PART:

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

## Bulk density measures

STANDARDS: EN 1097:3 - 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 and 20 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.



A069-02

A069-01



**A075**

**Los Angeles abrasion machine**

STANDARDS: ASTM C131 - EN1097-2 - AASHTO T96  
UNE 83116 - NF P18-573  
UNI 8520 - CNR N° 34

Used to determine the resistance of aggregates to abrasion. It comprises a heavy steel cylinder of 711 mm inside diameter x 508 mm inside length, mounted on a base frame. The cylinder rotates at 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.

Supplied **"without"** abrasive charges to be ordered separately according to the Standards the machine has to comply.

Power supply: 220-240V 50 Hz 1ph 750W  
Dimensions: 1000x800x1000 mm  
Weight: 370 Kg



A075

**A075-01**

**Los Angeles abrasion machine,**

same to mod. A075 but equipped with steel cabinet and safety microswitch, to 89/392/CEE Directive.

Dimensions: 1100x1180x1250 mm  
Weight: 450 Kg



A075-01

**A075-02**

**Los Angeles abrasion machine,**

same to mod. A075, but equipped with steel cabinet and safety microswitch to 89/392 CEE Directive, lined with sound-proofing material for noise reduction.

Dimensions: 1100x1180x1250 mm  
Weight: 460 Kg



A075-02

A076-01



NEEDED ACCESSORY:

**A076-01**

Set of 12 ABRASIVE CHARGES to meet ASTM C131 - AASHTO T96 - UNE 83116 - UNI 8520 - NLT 325 - CNR N° 34 Standards

**A076-02**

Set of 12 ABRASIVE CHARGES to meet EN 1097-2 - NF P18-573 Standards

# Aggregates - Rocks



**A078**

## Micro-Deval testing machine

STANDARDS: EN1097-1 - NF P18-572 - LCPC  
UNE 83115 CNR N° 109

Used to determine the quality of aggregates by abrasion. The machine essentially comprises a heavy steel frame on which four stainless steel cylinders dia. 200x154 mm are mounted. The unit is supplied complete with automatic digital counter and 20 Kg of stainless steel abrasive spheres dia. 10 mm

Power supply: 220-240V 50 Hz 1ph 750W

Dimensions: 1000x450x920 mm

Weight: 150 Kg



A078

**A078-01**

## Micro-Deval testing machine, same to mod.

A078, but equipped with steel cabinet and safety microswitch to 89/392/CEE Directive.

Dimensions: 1150x600x1150 mm

Weight: 180 Kg

**A078-02**

## Micro-Deval testing machine, same to mod. A078,

but equipped with steel cabinet and safety microswitch to 89/362 CEE Directive, lined with sound-proofing material for noise reduction.

Dimensions: 1150x600x1150 mm

Weight: 190 Kg

### ACCESSORIES:

**A078-12** Stainless steel cylinder dia. 200 by 400 mm long for aggregates having size 25 to 50 mm

**A078-13** Stainless steel spheres dia. 30 mm. Pack of 12.

**A078-14** Stainless steel spheres dia. 18 mm. Pack of 52.

### SPARE PARTS:

**A078-11** Set of 20 Kg abrasive stainless steel spheres dia. 10 mm

**A078-15** Standard stainless steel cylinder, dia. 200 by 154 mm long.



A078-02

A078-12



A078-15

## 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 automatic counter, two collecting pans.

Power supply: 220-240V 50 Hz 1ph 750W

Dimensions: 1500x520x1280 mm

Weight: 140 Kg



## A079-01

**Deval testing machine** same to mod. A079, but equipped with steel cabinet and safety microswitch to 89/392/CEE Directive.

Dimensions: 1650x650x1400 mm

Weight: 170 Kg

## A079-02

**Deval testing machine**, same to mod. A079, but equipped with steel cabinet and safety microswitch to 89/392 CEE Directive lined with sound-proofing material for noise reduction.

Dimensions: 1650x650x1400 mm

Weight: 180 Kg



## A080

### Aggregate impact value apparatus

STANDARD: BS 812

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.

Supplied complete with cylindrical mould dia. 102x50 mm, cylindrical measure dia. 75x50 mm deep, tamping rod.

Dimensions: 445x300x880 mm

Weight: 60 Kg

## A080-01

### Aggregate impact value apparatus

STANDARD: NF P18-574

Similar to mod. A080, but with cylindrical mould dia. 102x52 mm conforming to French NF Standards.





**A081**  
**Lightweight aggregates crushing resistance**

STANDARD: UNI 7549 - Part 7

Formed by the crushing test set, graduated cylinder 1000 ml.  
Cadmium plated for corrosion protection.  
Weight: 25 Kg



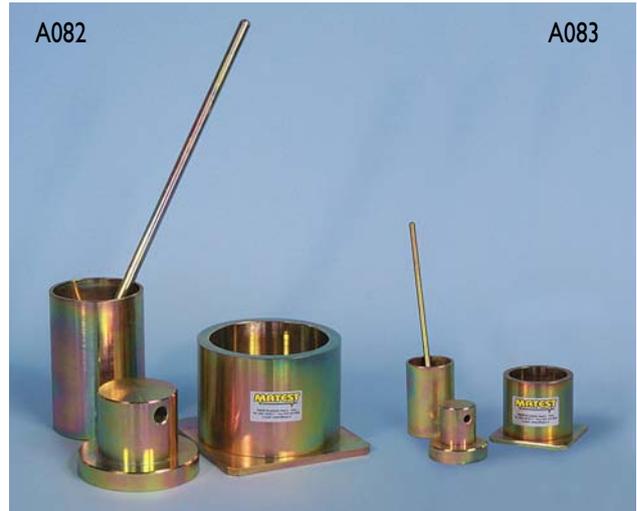
A081

**A082**  
**Aggregate crushing value apparatus**  
**dia. 150 mm**

STANDARD: 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



A082

A083

**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



A084

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

STANDARDS: EN 1097-6, BS 812:2, 1881:14, UNI 6394-2

Specific gravity frame mod.V084  
See section "V" General Equipment



V084

**A083**  
**Aggregate crushing value apparatus**  
**dia. 75 mm**

STANDARD: 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 quartering soil and aggregates.

Size: 140x140 cm

Weight: 1 Kg

**A086**  
**Volumeter for aggregates**

STANDARD: BS 812

Used to measure coarse aggregate density by water displacement method.

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



A086



## Jar mill

Designed to reduce from 5 mm to powder granulometric materials like: cement, stones, rocks, hard materials. Three models available: 0,3 - 1 - 1,5 litre jar capacity.

Jar is in prokorund material with relevant hard porcelain spheres

Noise reduction steel cabinet and microswitch to 89/392/CEE Directive.

Built in timer: Supplied complete. Rpm: about 400

Power supply: 220-240 V 50 Hz 1 ph 750W

Dimensions: 350x710x410 mm

Weight: 50 Kg

A091



jars detail

section A



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## A092

### Laboratory jaws crusher

STANDARD: UNE 83 120

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 2 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 mill mod. A091.

Complete with steel cabinet to 89/392/CEE Directive, and collecting pan.

Power supply: 220-240 V 50 Hz 1 ph 750W

Dimensions: 450x1000x620 mm

Weight: 115 Kg



A092

MODELS:

**A091 Jar mill,**  
0,3 litre capacity

**A091-01 Jar mill,**  
1 litre capacity

**A091-02 Jar mill,**  
1,5 litre capacity



A092-01

## A092-01

**Laboratory jaws crusher**, identical to mod. A092, but supplied "without" safety cabinet to CE Directive.

## A093-02

**Dry mixer**, same to mod. A093, but equipped with steel cabinet and safety microswitch and sound-proofing material for noise reduction.

Dimensions: 850x800x1300 mm

Weight: 160 Kg

## 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

Power supply: 220-240 V 50 Hz 1 ph 750W

Dimensions: 700x700x1200 mm

Weight: 130 Kg



A093

## A093-01

**Dry mixer**, same to mod. A093, but equipped with steel cabinet and safety microswitch to 89/392/CEE Directive.

Dimensions: 850x800x1300 mm

Weight: 155 Kg



## 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: 220-240V 50 Hz 1ph 200W

Dimensions: 370x500x300 mm

Weight: 31 Kg



A095

SPARE PART:

**A095-01** ABRASIVE silicon carbide disc. Pack of 25.

## A102

### Bottle roller

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.

Power supply: 230V 50 Hz 1ph

Dimensions: 385x295x160 mm

Weight: 10 Kg



A102

## 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

V172-05

V125-03

## A103

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

## A104

### Ultrasonic cleansing bath

Used for a safe and valid cleaning of glassware and sieves which could be damaged by ordinary cleaning methods.

Internal diameter 260 mm - height 180 mm

Capacity: 10 litres

Stainless steel made, with incorporated electronic generator, frequency 38 KHz.

Power supply: 220-240V 50 Hz 1ph 300W

Weight: 8 Kg



A104

## A104-01

### Ultrasonic cleansing bath

Same to mod. A104 but with inside dimensions: dia. 410xh 200 mm

Capacity: 25 litres

Power supply: 220-240V 50 Hz 1ph 600W

Weight: 16 Kg

ACCESSORY:

## A104-02

CLEANSING LIQUID for ultrasonic bath, 25 litre can.

## A106

### Melting pot

Used to melt wax and other materials, it maintains heat from room temperature to max. 150°C, with accuracy  $\pm 1,5^\circ\text{C}$ .

Complete with adjustable thermostat and pilot lamp fully isolated to CE requirements.

Capacity: 3 litres

Internal dimensions:

$\varnothing$  200x160 mm.

Power supply:

220-240V 50 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

# Aggregates - Rocks

## 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.

## section A

### A103-10

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

Supplied complete with stainless steel cover:

Weight: 600 g approx.

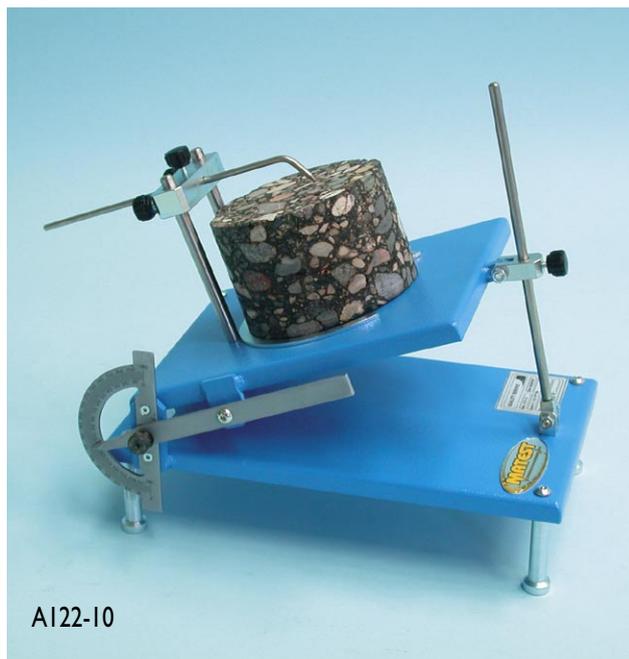
### A103-11

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

Weight: 2 kg approx.



## News



### 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: 270 x 175 x 265 mm. Weight : 5 kg approx.

### 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.



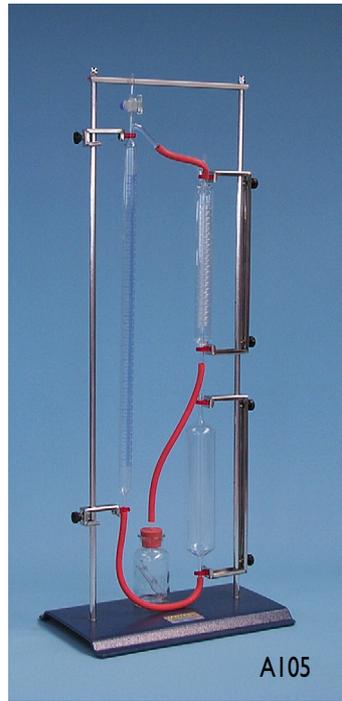
**A105**

## Calcimeter, Dietrich-Frühling

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

**A109**

## Abrasimeter

STANDARDS: EN 154 - 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 safety cabinet to 89/392/CEE Directive.

Power supply: 220-240V 50 Hz 1ph 300W

Dimensions: 400x700x500 mm

Weight: 38 Kg



A112

## 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



Accessories:

A107-11

**E077**

LENGTH COMPARATOR. See section "E" Cement

**E078-06**

Reference rod 205 mm long. Standard: EN 1367-04

**A107-11**

Spare inserts for A107 mould. Pack of 12 pieces

A109



**A112**

## Abrasion tester - Tribometer

STANDARDS: CEN/TC 178 - UNI 10532 - EN 1342 - EN 1341:2000

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.

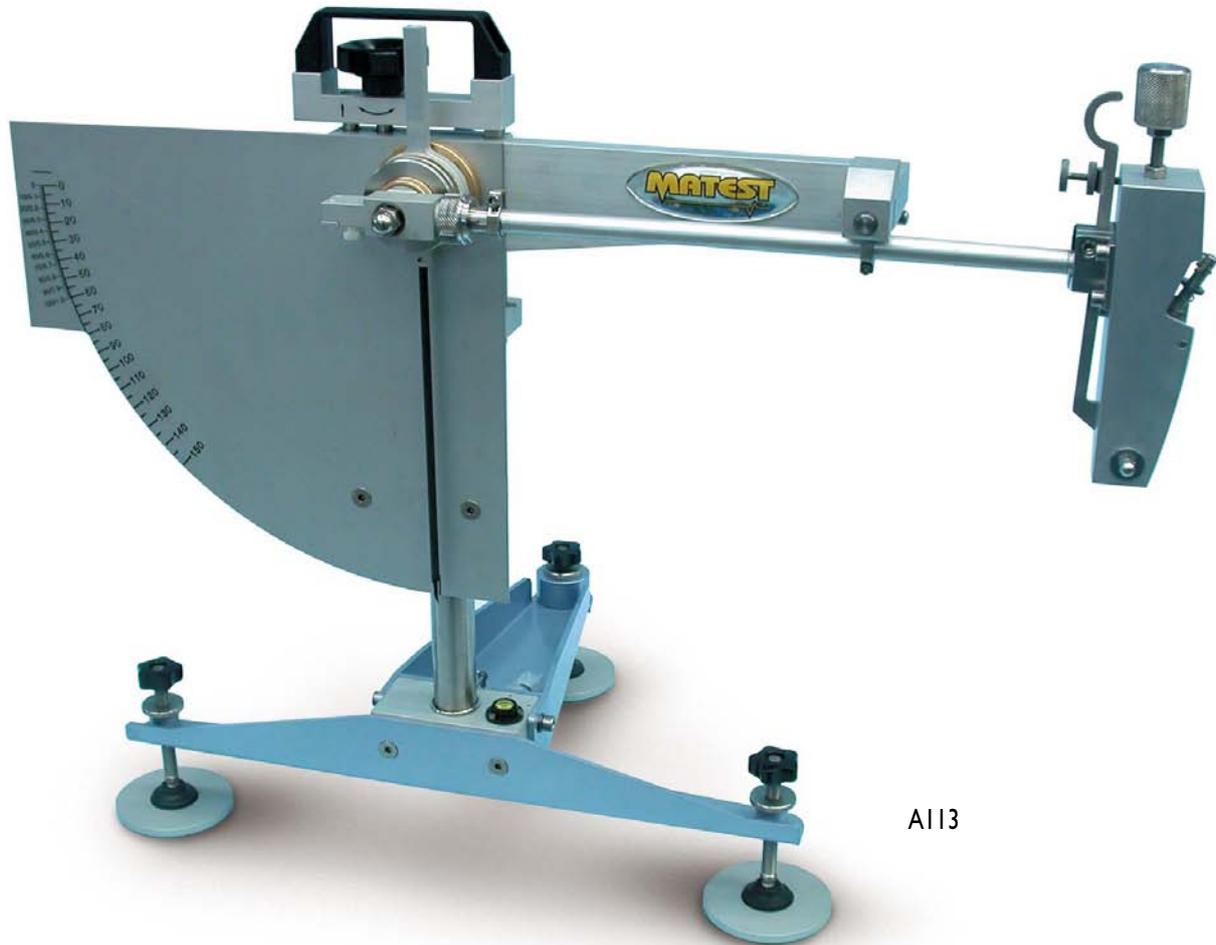
A charge of abrasive material must be interposed between the disc and the specimen. The instrument is supplied with an electronic speed controller and with shutting off device after the set number of revolutions, 1 Kg of abrasive material, accessories and safety cabinet to 89/392/CEE Directive.

Power supply: 220-240V 50 Hz 1ph 500W

Dimensions: 450x420x800 mm

Weight: 125 Kg





A113



## A113 SKID RESISTANCE AND FRICTION TESTER

STANDARDS: EN 1097-8 / EN 1338, 1341, 1342 / EN 13036-4 / ASTM E303 / BS 812:114 / CNR N. 105, 140 / NF P18-578, P18-575 / NLT 174

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  $+110^{\circ}\text{C}$ . for surface temperature measurement.
- Stool, wash bottle, bristle, tool set for machine use.
- Carrying case.
- Calibration Certificate conforming to EN 1097-8.1

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



A113 with standard accessories



A110-11 + A110-12



A110-03

A110-01

**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.



A113 contained in carrying case

ACCESSORIES:

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

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

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

**A110-13** Clamping device for tests on natural stones (EN 1341, 1342) and for concrete block pavers (EN 1338)



## A110

### Skid resistance tester

STANDARDS: ASTM E303 - BS 812, 8204 - EN 1097-8  
NF P18-578 - CNR 105, 140 - EN 1342

For measuring road surface frictional properties.  
It measures the energy loss when a rubber slider edge is propelled over the surface under test.

Supplied complete with 6 rubber sliders for site use, setting gauge, two spanners, water bottle, thermometer, tools, carrying case.

Case dimensions: 800x650x280 mm

Weight: 32 Kg

ACCESSORIES:

#### A110-01

Rubber slider for polished stone value laboratory test.

#### A110-02

Metal base plate complete, for polished stone value test.

#### A110-03

Spare rubber slider for site use.

## A128

### Accelerated polishing machine

STANDARDS: BS 812 :114 - EN 1097-8 - NF P18-575 - CNR 105

It measures the resistance of road aggregates 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 fed by mechanical feeders at fixed speed.

The flour emery is loaded on to the specimen through a suitable opening.

The water is supplied at a controlled rate through a water container.

The machine provides a method of preparing polished stone specimens for use with the Skid Resistance Tester mod. A110 when used in Laboratory.

The unit is supplied complete with four moulds.

Power supply: 220-240V 50 Hz 1ph 400W

Dimensions: 1520x720x740 mm

Weight: 175 Kg

ACCESSORIES:

**A128-02** Corn Emery ungraded, 10 Kg pack

**A128-03** Flour Emery ungraded, 6 Kg pack

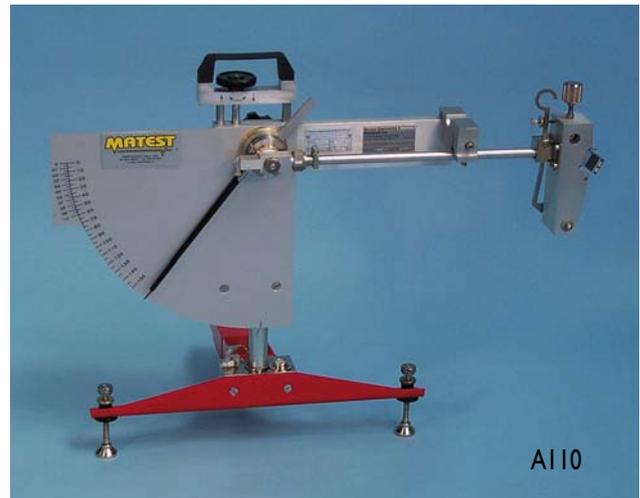
**A128-04** Control stones, ungraded, 50 Kg bag.

**A128-05** Friction criggion stone, ungraded, 50 kg bag.

**A048-16** Bar Sieve, slot width 7,2 mm to retain the road aggregates

SPARE PART:

**A128-01** Set of Four Moulds for preparing specimens



A110

## A115

### Mohs' kit

STANDARD: EN 101

Used for determining the hardness of the surface of the materials.  
Composed by a case containing 10 minerals of the Moh's hardness scale.

Weight: 500 g



A115



A128

## A111

### Aggregate abrasion machine (Formerly Dorry)

STANDARDS: BS 812:3 - EN 1098/8

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 anti-vibration pads, steel lap wheel 610 mm diameter, precision machined steel shaft and sealed bearings, resilient mounted electric motor, gear box, scraper blades for sand removal, revolution counter.

Supplied complete with two specimen moulds, two flat plates, two trays.

Power supply: 220-240V 1ph 50 Hz

Dimensions: 800x700x1100 mm - Weight: 200 Kg



A117 + A116-11 + A116-12

## A117

### End-Over-End shaker

STANDARD: 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 89/392/CEE Safety Directive.

Supplied without gas jars to be ordered separately

Power supply: 220-240V 50 Hz 1ph 150W

Weight: 20 Kg

ACCESSORIES FOR A117:

**C306-03** SEPARATE CONTROL PANEL, complete with main switch, fuse, electric protections.

**C279-02** SEPARATE CONTROL PANEL, complete with ON/OFF switch, timer, fuse, electric protections.

**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

## A111



section A



45



## A122

### Barton comb profilometer

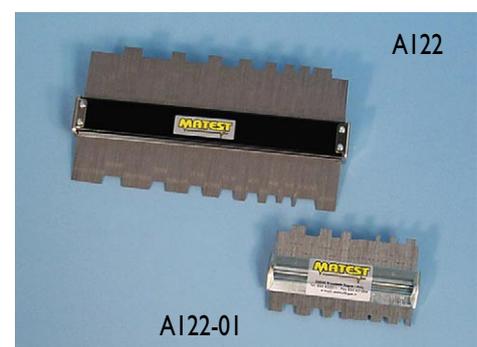
Used for the evaluation of the surface roughness.

This simple device, 300 mm long, 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

## A122-01

**Barton comb profilometer** same to mod. A122 but 150 mm long.



**C381**

## Rock classification Hammer

STANDARD: ASTM D5873

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.

Weight: 2 Kg

C381



A121

**C348 \***

**Rock and masonry saw**, it accepts blades up to dia. 350 mm. Useful cutting height: 110 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 mod. C348 to C353

section A

ACCESSORY:

**A121** ROCK CRADLE, universal model to locate EX to NX core rock specimens during the classification tests by the Rock Hammer mod. C381. Weight: 10 Kg

**A125**

## Digital point load tester (Rock strenght 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 pressure transducer with a digital display unit range 0-56kN, 65.000 divisions, 0,001 kN resolution, accuracy: ± 1%. The strength index 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:

370x320xh710 mm

Weight: 25Kg



A125



SPARE-PART:

**A125-01**

Set of two hardened conical points.

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)



C348+C352

C368

## Index of velocity of rocks:

Ultrasonic pulse velocity tester.  
See section "C" concrete mod. C368÷C372





## A124

### Filler compaction apparatus

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

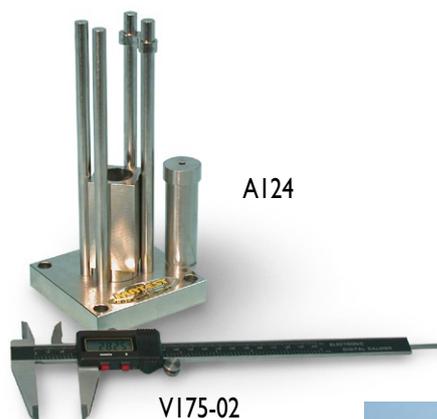
Used to determine the void content of dry compacted filler:

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



A124

V175-02

ACCESSORY:

### V175-02

DIGITAL VERNIER CALIPER 0 - 200 mm x 0,01 mm sens.



A129-01

## A129

### Portable rock shear box assembly

STANDARD: 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



A129-03

A129

ACCESSORIES:

**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.

**A129-03\*** Set of 4 dial gauges 10 mm stroke x 0,002 mm division, complete with supports for Vertical displacement measure, conforming to the ASTM D5607 Standards

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

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

STANDARDS:

EN 1367/1 - ASTM C671, C682

BS 812:124 - CNR n° 80

UNI 8520-20

Climatic chamber for frost and thaw tests, mod. C314

See section "C" concrete.



C314



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.

# Aggregates - Rocks

## Hoek cells for rock triaxial tests

For use with pressures up to 70 MPa.

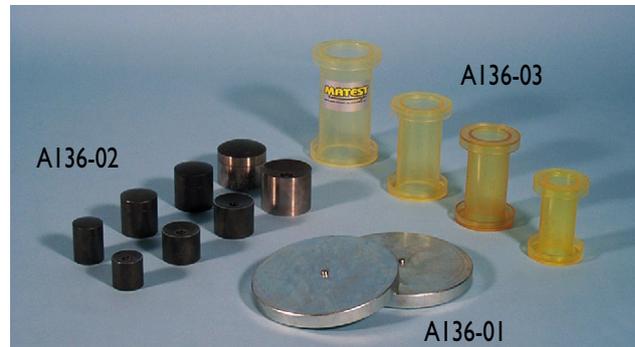
Used to measure the strength of cylindrical rock specimens which are subjected to triaxial compression.

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

section A

A136 - 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>A136</b>	30,10x 60 mm	AX	<b>A136-01</b>	<b>A136-02</b>	<b>A136-03</b>	<b>A136-04</b>	<b>A141-01</b>
<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.

**To perform the Compression Triaxial test with the Hoek Cells, a suitable compression testing machine having capacity 1500 kN or 2000 kN or 3000 kN must be utilized. See section "C" Concrete.**

### A140-01

**Coring machine** used in the laboratory, to obtain cores from irregular rock samples. To be used with the Core Drilling Barrels (accessory A136-04÷A139-04).

The 2 speed electric motor 1500/2700 rpm is equipped with friction device and double safe isolation to 89-392-CEE Directive. Complete with specimen's clamp device, water cooling system and water tank.

Power supply: 220-240V 50/60 Hz 1ph 1800W

Weight: 60 Kg approx.

### A141

#### Extruder

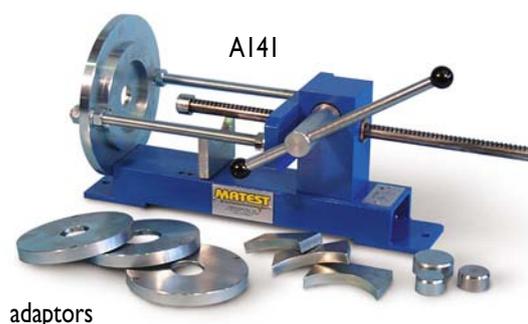
Used to eject the rock sample from the rubber jacket, avoiding to empty the confining fluid.

Supplied without adaptors to be ordered separately (see table).

Weight: 12 Kg



A136-04



adaptors





## A142 Hydraulic constant isotropic cell pressure system

The unit consists of a hand operated pump, complete with precision pressure gauge supplying pressures up to 70 MPa, complete with reservoir and connections, providing a continuous all round pressure source to the Hoek Cell.

Weight: 18 Kg

ACCESSORY:

### A129-02

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

## 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:

**A136-05** Specimen dia. 30,10 mm

**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.



A142+A129-02



## A144

### Permeability constant oil/water pressure system

Providing an infinitely variable constant pressure from 0 to 3500 kPa.

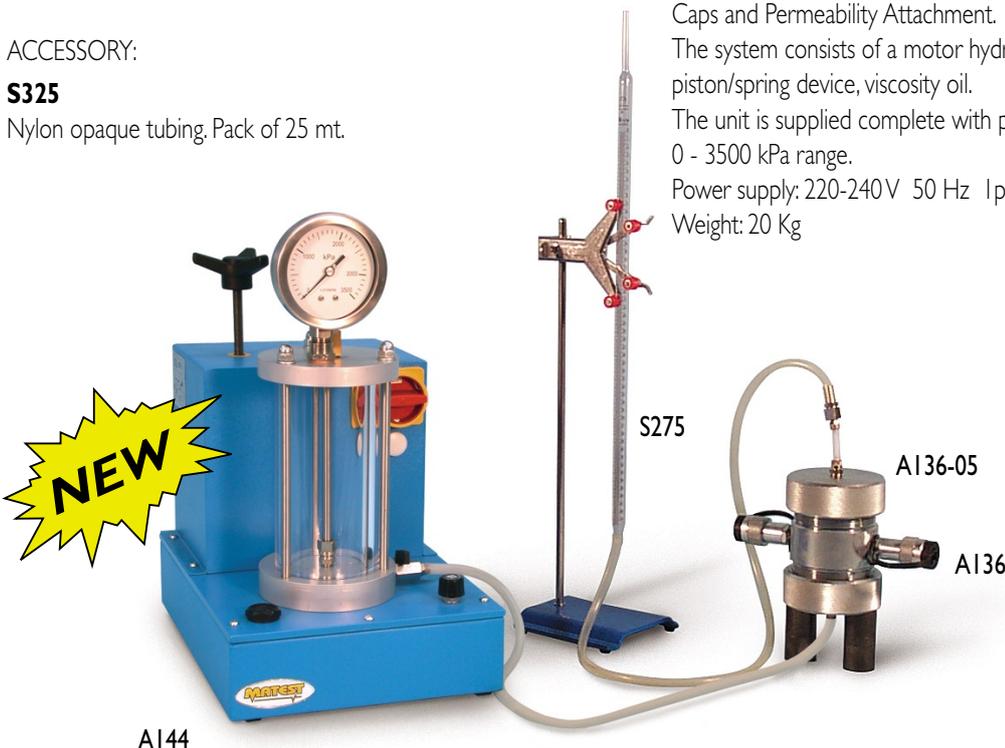
To be used with the Hoek Cell equipped with Permeability End Caps and Permeability Attachment.

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

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

Power supply: 220-240V 50 Hz 1ph

Weight: 20 Kg



**NEW**

A144

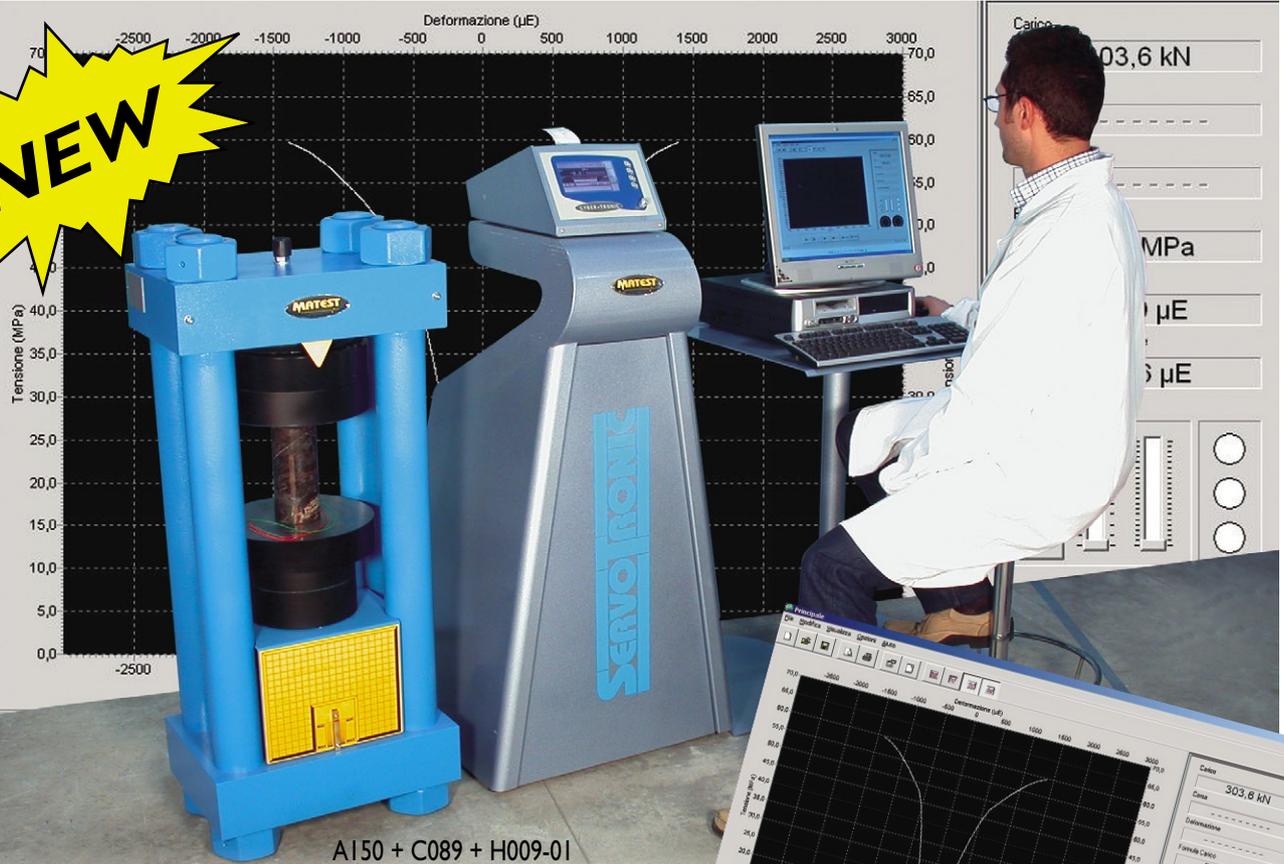
S275

A136-05

A136

**NEW**

section A



50

## A150 ELASTIC MODULUS of rock specimens in uniaxial and triaxial tests

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

Standards: ASTM 3148, D2938, D5407, D2264, UNI 9724-8 ISRM

It can be used with a MATEST machine frame or a machine belonging to the user with capacity of 1500, 2000, or 3000 kN to be coupled to the Automatic Servo-controlled system "Servotronic" (ref. C104).

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 and it allows a micrometric action on the pace rate granting excellent results.

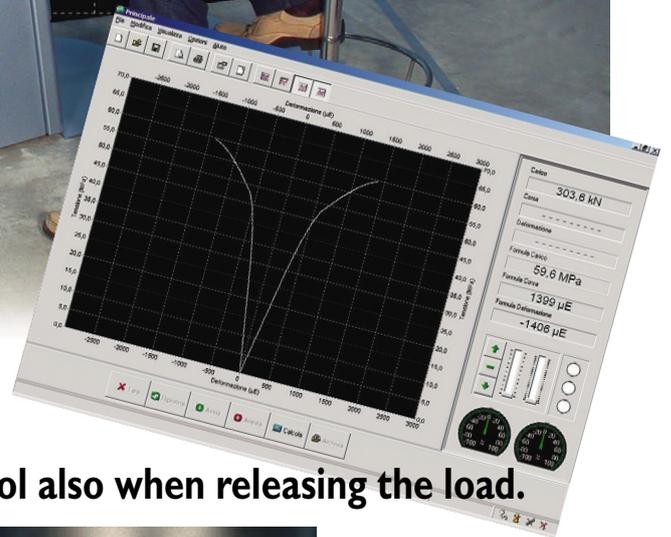
A laser position detector allows a rapid positioning of the piston. This grants a touching sensitivity of test starting of about 0.1 per thousand of the maximum capacity.

- **Electronic measuring system**

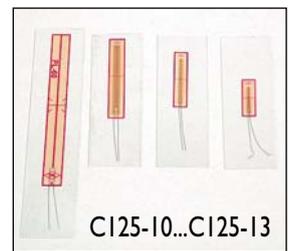
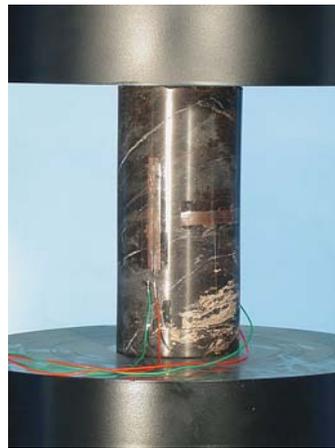
The high performance control and data processing unit controlled by a 32 bit microprocessor, can manage up to 3 high resolution channels for the control of load cells or transducers with strain gages bridge and other 4 channels for the management of the signals coming from single use extensometers (strain gauges).

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 on the Personal Computer following the most updated standards for this application.

The single use extensometers available in different dimensions must be interfaced using a specific module that makes the automatic calibration of the zero and of the measuring range after a special thermal compensation. This grants a five times better precision than the one required by the standards.



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

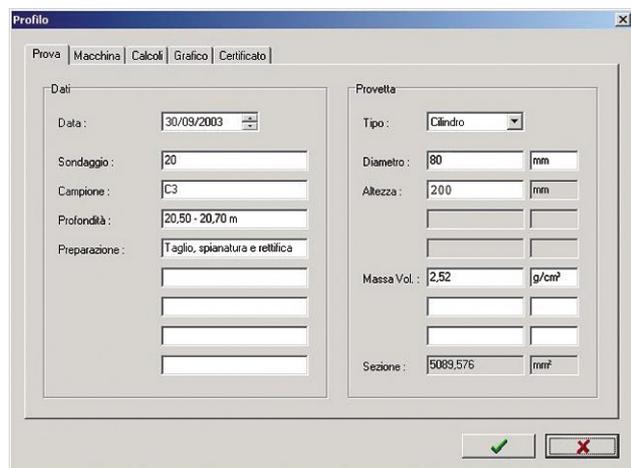




• **Data acquisition and processing software UTM2 (Universal Testing machine 2) with License for Elastic Modulus on Rocks.**

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.

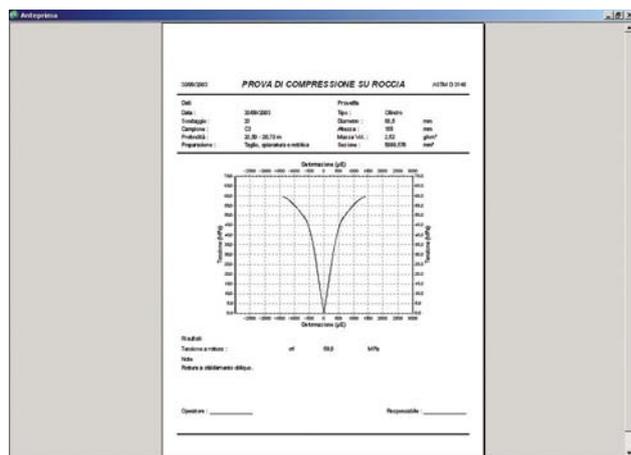
The user must introduce a list of dates concerning the specimen that will be tested and the kind of test that he wants to make: shape of the specimen (cylinder-cube-block), dimensions, age of the specimen, average expected breaking value, etc... The appliance allows verifying the proper reading of the 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 (RS232) 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.



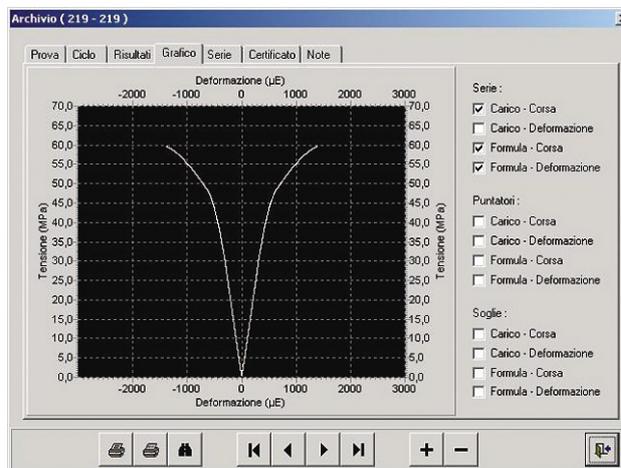
Input of the dates and personalisation of the test profile.

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.

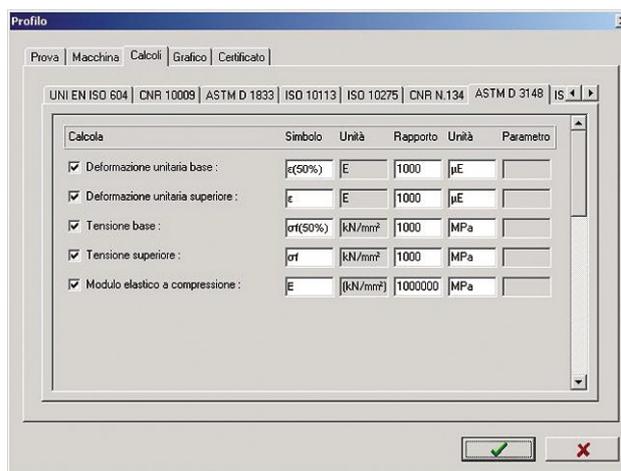
- Extensometer-Digital unit kit.
- Pack of 10 extensometers (strain gages) single use (to be chosen among models from C125-10 to C125-13)
- Kit for the applications of extensometers composed by glue, welder; solder; cleaning liquid, accessories, everything in its transportable case.



Composition and personalisation of a certificate at the end of a test.



Graphical representation with the possibility to personalise the scales and the dimensions visualised.



Selection of the Standard used for the test with the possibility to personalise the calculation algorithm.

ACCESSORIES:

**A150-01** Software to make Secant Compression Elastic Modulus tests on concrete.

STANDARDS: UNI 6556 – ASTM C469 – ISO 6784 – DIN 1048.

SPARE PARTS:

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.
- C125-16** Solder
- C125-17** Glue
- C125-18** Cleaning liquid
- C125-19** Welder

## TRIAXIAL TESTS ON ROCK SPECIMENS

STANDARDS: ASTM D2664, D5407, D3148, D2938 - ISRM - UNI 9724-8

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.

section A



52



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.

The standards requires 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.

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 "Servotronic" model C104 and to the automatic system for the Elastic Modulus on rocks model A150, that includes the data acquisition and processing software.



A150 + C089 + H009-01 with A144



A150 + C089 + H009-01 with C104



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

- The water/oil pressure system (model A144) that grants a setting of the pressure between 0 and 3500 kPa, or
- The automatic servo-controlled system "Servotronic" (model C104) that grants a setting of the pressure up to 80 Mpa, or
- The manual constant isotropic hydraulic system complete with a pressure accumulator model A142 + A129-02 that grants a constant pressure up to 70 Mpa.



A150 + C089 + H009-01 with A142 + A129-02