



Materials Testing Equipment

CMH Ltd is an export supply house based in West Sussex in the UK specialising in a wide range of field and laboratory apparatus.

Established since 1986 , CMH offers an individual supply service through an International agency network.

The CMH product range includes :

Testing equipment for aggregate ,soil, cement, concrete, bitumen and petroleum. Road testing apparatus and the supply of British and European standard sands.

Non destructive testing equipment for concrete structures including Schmidt hammers, Lok Testers, Covermeters, crack detectors, microscopes and corrosion testers.

General laboratory instrumentation and consumables, viscometers, drying ovens, test sieves, water baths, coolers, balances, glassware

CMH are distributors for OHAUS balances and UK dealers for GERMANN Instruments and MATEST MATERIALS TESTING

**SERVICE
FIRST AND LAST**

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section guide



Section A AGGREGATES - ROCKS

page 6 - 33



Section B BITUMEN - ASPHALT

page 34 - 67



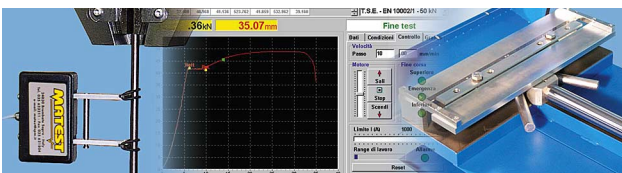
Section C CONCRETE

page 68 - 141



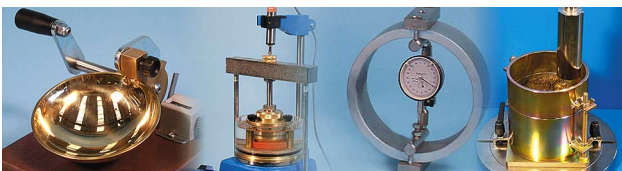
Section E CEMENT - MORTAR

page 142 - 169



Section H STEEL

page 170 - 187



Section S SOIL

page 188 - 247

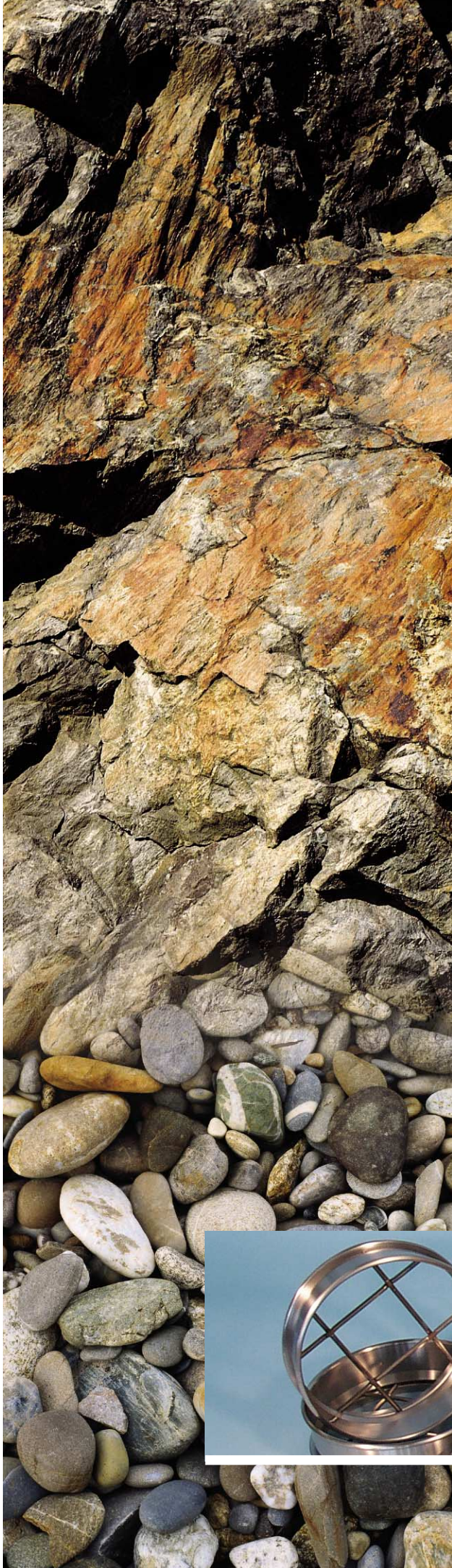


Section V GENERAL EQUIPMENT

page 248 - 273

GENERAL INDEX

page 275 - 281



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.



Index section AGGREGATES - ROCKS

	Mod.	Page		Mod.	Page
Abrasimeter / Tribometer	A112	27	Mill jar	A091	25
Abrasion machine, Dorry	A111	29	Mixer dry	A093	25
Abrasion machine, Los Angeles	A075	21	Moisture meter Microlance	A021	11
Accelerated polishing machine BS812	A128	28	Moisture testers	A025	10
Aggregate crushing value BS812	A082	24	Muffle ovens	A022	9
Aggregate Impact value	A080	23	Ovens, laboratory	A001	8
Barton comb	A122	29	Pendulum skid tester	A110	28
Bottle roller	A102	26	Permeability of rocks	A145	33
Bulk density measures	A069	20	Point load tester	A125	30
Calcmeter Dietrich Fruhling	A042	11	Polisher - Grinder	A095	26
Chapman flask	A029	11	Polishing machine accelerated	A128	28
Chloride titrator strips	A019-01	9	Quantab chloride strips	A019-01	9
Cleansing bath, ultrasonic	A104	26	Quartering canvas	A085	24
Compaction apparatus, filler, BS812	A124	31	Reaction container	A030	11
Core drill machine	A140	32	Riffle boxes	A062	20
Crusher, aggregates	A092	25	Rock triaxial Hoek cells	A136	32
Crushing coefficient machine	A108	27	Roller bottle	A102	26
Crushing value apparatus BS812	A082	24	Sample splitters	A062	20
Cutting machine	C351	30	Shaker, end-over-end	A116	29
Desiccators	A035	11	Shakers for sieves	A060	17
Deval testing machine	A079	23	Shape gauge	A072	19
Drying ovens	A001	8	Shear box assembly	A129	31
End-Over-End shaker	A116	29	Skid tester	A110	28
Filler compaction apparatus BS812	A124	31	Sieves	A052	13
Flakiness gauge	A070	19	Sieve grids, flakiness	A048	12
Flakiness sieves	A049	12	Sieve shakers	A060	17
Gauges, flakiness, length, shape	A070	19	Siphon can apparatus	A084	24
Geological hammers	A132	31	Speedy moisture testers	A025	10
Grinder - Polisher	A095	26	Splitters for aggregates	A062	20
Hammer, rock	C381	30	Sulphate test strips	A019-03	9
Hoek cells	A136	32	Triaxial rock Hoek cells	A136	32
Impact testing machine	A080	23	Tribometer - Abrasimeter	A112	27
Jar mills	A091	25	Ultrasonic cleansing bath	A104	26
Length gauge	A071	19	Voids of Aggregates	A069	20
Los Angeles abrasion machine	A075	21	Volumeter for aggregates	A086	24
Micro Deval testing machine	A078	22	Wet washing sieve	A045	16





Laboratory ovens

STANDARDS: ASTM C127, C136, D558, D698, D1557, D1559 -
EN 932-5, 1097-5 - BS 1377, 1924

Laboratory purpose double-walled ovens, specially designed for drying, baking, conditioning and moisture determination.

"Both internal chamber and the exterior are stainless steel made".

Insulation is obtained with 60 mm thick glass fibres.

Complete with two stainless steel shelves that can be positioned at various heights, analogue thermostat for temperature setting, on/off switch, pilot light.

Temperature range from ambient to 200°C.

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



A002

Models	Capacity litres	Inside Dimens. mm	Outside Dimens. mm	Wattage	Weight Kg	Spare Tray
A001	50	350x390x400	450x620x620	750	40	A006-01
A002	100	400x450x600	520x670x820	1050	65	A006-02
A005	150	480x510x600	580x740x820	1500	80	A006-03
A003	200	590x600x600	690x870x830	1800	100	A006-04
A004	300	600x620x800	700x800x1020	2800	130	A006-05

ACCESSORY:

A006/08 Mercury Control Thermometer 0-300°C. for mod.A001 to A005

Laboratory ovens with forced ventilation and digital thermostat

STANDARDS: ASTM C127, C136, D558, D698, D1557, D1559 -
EN 932-5, 1097-5 - BS 1377, 1924

Particularly suitable for uses where high accuracy and uniformity of temperature are required.

Double-walled, sturdy, they are "all stainless steel made", with 60 mm thick glass fibres insulation.

Standard supply comprises:

digital precision thermostat, forced ventilation system to ensure temperature uniformity, ventilation slide for fresh and used air, two shelves, on/off switch, pilot lamp.

Temperature range from ambient to 200°C.

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



A011



Models	Capacity litres	Inside Dimens. mm	Outside Dimens. mm	Wattage	Weight Kg	Spare Tray
A011	100	400x450x600	700x620x820	1300	75	A011-01
A012	200	590x600x600	890x770x820	2000	110	A012-01
A013	300	600x620x800	900x790x1020	2800	130	A013-01
A018*	440	900x700x700	1220x840x930	4000	150	A018-01
A020*	720	900x620x1300	1190x720x1520	6000	180	A020-01

* NOTE: Two doors double walled model

ACCESSORY:

A006-08 Mercury control thermometer 0-300°C. for mod.A011 to A020

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. The lateral opening door to make an easy opening, pressure wedge and a feeding device that stops when the door opens. Electronic visualized regulation of the temperature obtained by a digital thermostat. The smoke exhaust is placed on the back part of the furnace. The thermocouple is shelter by a ceramic sheating. Maximum temperature uniformity.

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.

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 50 strips.

A019-02 Quantab Chloride Titrator Strips, type 1176, range 0,05% to 1% (300 to 6000 ppm) Na Cl. Pack of 50 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.



A022

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



A024

Hot Plates

see section "V"
mod.V200 pag. 269



V200

V200-01



“Speedy” Moisture Testers

STANDARDS: ASTM D4944 - AASHTO T217 - UNE 7804 - BS 812

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

A027 SUPER SPEEDY Moisture tester 140 grams capacity.

Moisture range: 0 - 11%

Weight: 12 Kg

SPARE PART:

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



A025



A026



A027

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 - 20%

Supplied complete with 20 carbide ampoules, small balance, accessories, self-contained.

Weight: 5 kg

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

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)



A028-02



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

A021

Moisture meter "Microlance"

This electronic tester measures and visualizes directly on the display the moisture and temperature of fine aggregates and sand by simply inserting the crucible tip. Suitable for both site and laboratory tests.

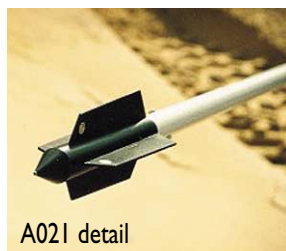
Moisture range: 0-35%, accuracy 0,5%

Temperature range: -20°C to +60°C, accuracy 0,5°C.

Battery powered.

Dimensions: 120x120x1200 mm

Weight: 2 Kg



Moisture determination balance, see section "V" mod. V023-01, pag. 251



Desiccators

Complete with perforated plate

MODELS:

A035 Dia. 200 mm

A036 Dia. 250 mm

A036-01 Dia. 300 mm

Vacuum type desiccators

Complete with perforated plate

MODELS:

A039 Dia. 200 mm

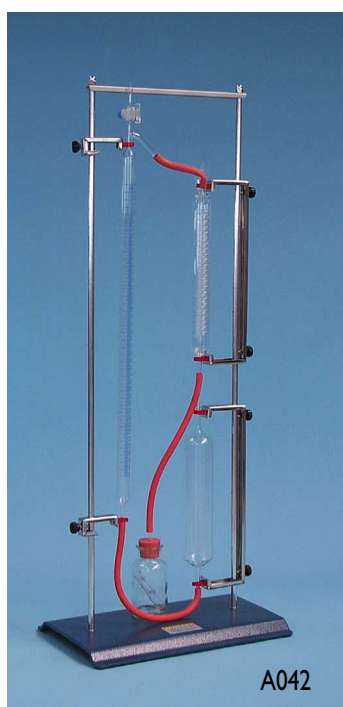
A040 Dia. 250 mm

A040-01 Dia. 300 mm

ACCESSORY:

V300-15

Desiccators salts Silica gel box 1000 g



A042

Calcimeter, Dietrich-Frühling

Used for the determination of calcium carbonate (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 (CO_2) is in relation to the CaCO_2 amount contained in the material, it is possible to calculate the percentage of CaCO_3

Dimensions: 400x200x1100 mm

Weight: 13 Kg

A030

Reaction container

STANDARDS: ASTM C289 - UNI 8520-22

Used for the chemical determination of the potential reactivity of aggregates with alkalis in cement.

Manufactured from stainless steel and fitted with an air-tight cover.

Capacity 60 ml approx.

Weight: 2 Kg

Aggregates - Rocks

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 meet EN Standard.

Weight: 4 Kg each sieve.



A048

MODELS:

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 slot width 9,5 mm

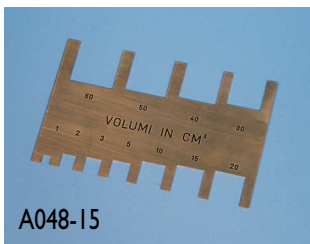
A048 Complete set of 13 grid sieves from 2,5 (A048-01) to 40 mm (A048-13) slot width

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:

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

A049 Complete set of n°7 flakiness sieves



A049

Test sieves

STANDARDS: ASTM E 11 - AASTHO T27 - BS 410 - NF X11-504 - ISO 3310, 565 - DIN 4187/1 - EN 933-2 - UNI 2331, 2333

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-...

section A



13

HOW TO BUY PERFORATED PLATE SIEVES, "Square Hole"

STANDARDS: ASTM E 11 - 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



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".

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

section A



14



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	-	A052-58	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	A031-32	A032-32	A033-32
16,0	A031-15	A032-15	A033-15	106	A031-30	A032-30	A033-30
19,0	A031-16	A032-16	A033-16	125	A031-31	A032-31	A033-31

Table of the perforated plate sieves, "round holes"

STANDARD: UNI 2334

section A



16

Aperture Size mm	Frame Dia. 200 mm	Frame Dia. 300 mm	Aperture Size mm	Frame Dia. 200 mm	Frame Dia. 300 mm
1	A037-01	A038-01	17	A037-18	A038-18
2	A037-02	A038-02	18	A037-19	A038-19
3	A037-03	A038-03	19	A037-20	A038-20
4	A037-04	A038-04	20	A037-21	A038-21
5	A037-05	A038-05	25	A037-22	A038-22
6	A037-06	A038-06	30	A037-23	A038-23
7	A037-07	A038-07	35	A037-24	A038-24
8	A037-08	A038-08	40	A037-25	A038-25
9	A037-09	A038-09	50	A037-26	A038-26
10	A037-10	A038-10	60	A037-27	A038-27
11	A037-11	A038-11	63	A037-28	A038-28
12	A037-12	A038-12	71	A037-29	A038-29
12,5	A037-13	A038-13	80	A037-30	A038-30
13	A037-14	A038-14	90	A037-31	A038-31
14	A037-15	A038-15	100	A037-34	A038-34
15	A037-16	A038-16	106	A037-32	A038-32
16	A037-17	A038-17	125	A037-33	A038-33



A045

A045 Wet washing sieve

STANDARD: ASTM E11
Stainless steel frame 8" dia. by 8" height, with stainless steel cloth ASTM n° 200, opening 0,074 mm Weight: 2 Kg



A046

Wet sieving attachment

These pan and lid models are used with all types of Sieve shakers (instead of the standard pan and lid) to perform a wet sieving test. The water enters through the spray nozzle mounted on top of the lid and comes out with fines from the pan.

MODELS:

- A046** Pan + Lid, stainless, dia. 200 mm
- A046-01** Pan + Lid, stainless, dia. 250 mm
- A046-02** Pan + Lid, stainless, dia. 8"
- A047** Pan + Lid, stainless, dia. 300 mm
- A047-01** Pan + Lid, stainless, dia. 315 mm
- A047-02** Pan + Lid, stainless, dia. 400 mm
- A047-03** Pan + Lid, stainless, dia. 450 mm
- A047-04** Pan + Lid, stainless, dia. 12"

- V179** Sieve Brush, soft hair; round, dia. 35 mm
- V179-01** Sieve Brush, soft hair; flat width 62 mm
- V179-02** Sieve Brush, double ended, brass and nylon bristle
- V179-03** Sieve Brush, double ended soft/hard nylon
- V179-04** Sieve Brush, fine brass



A056

A057

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



A058

A058 Noise reduction cabinet

For the sieve shakers A058-02 to A060-01, lined internally with sound-proofing material for noise reduction to CE Directive.

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.

A058-02

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

Basically similar to mod. A058-01 but equipped with electric motor.

Power supply 220-240 V 50 Hz 1ph 200 W

Weight: 23 Kg approx.



A058-01



A058-02



A060

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 sieving capacity is up to 6 Kg of material.

Provided of timer 0-60 minutes.

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

Dimensions: 320x380x800 mm

Weight: 20 Kg

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 sieving capacity is up to 6 Kg of material.

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 1 ph 450/750W



A059-01

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



A059-02

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



A061

High capacity sieve shaker

Designed for sieving considerable quantities of any material. The screen shaker accepts up to 30 litres of sample. Smaller amounts of fine materials may be handled efficiently down to 100 mesh or finer.

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: 220-240 V 50 Hz 1 ph 750 W

Dimensions: 585x790x850 mm

Weight: 180 Kg approx.

A061 with Screen Trays



A061-01

High capacity sieve shaker,

same to mod. A061 but equipped with steel cabinet and safety microswitch, to 89/392/CEE Directive.

A061-02

High capacity sieve shaker, same to mod. A061 but equipped with steel cabinet, safety microswitch and sound-proofing material for noise reduction.

A061-07 ÷ A061-46

Screen Tray, fine mesh, reinforced, size 457x660x75 mm, aperture from 0,075 to 5,6 mm (when ordering please specify screen aperture; see pag. 14).

A061-47 ÷ A061-77

Screen Tray, Coarse Serie size 457x660x75 mm, aperture from 6,3 to 125 mm (when ordering please specify screen aperture, see pag. 14-15).

A061-03

Tray only, without mesh, size 457x660x75 mm

A071

Length gauge

STANDARD: BS 812

Use 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

A071



A070

Flakiness/thickness gauge

STANDARD: BS 812

Used to verify if aggregate is flaky; i.e. if its thickness is less than 0,6 of its nominal size.

Constructed of heavy gauge sheet.

Weight: 600 g



A070

A072

Shape gauge

STANDARDS: DIN 4226 - CNR 95 - EN 933-4 - ISO 3310-1-2

For measuring the length/thickness ratio of individual particles.

Weight 0,5 Kg

A072





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. Galvanized or stainless steel made, it is supplied with two collecting pans.



A062

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	Galvanized	3-4" - 19 mm	12	5	A064-02
A065	Galvanized	1" - 25,4 mm	12	8	A065-02
A065-01	Galvanized	1 1-2" - 38 mm	8	9	A065-03
A066	Galvanized	2" - 50,8 mm	8	13	A066-02
A067	Galvanized	2 1-2" - 63,5 mm	8	15	A067-02



A067



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 divides samples so that half is representative of the original whole sample. It handles any material from sand sizes up to 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. Hopper capacity is 30 litres. 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.

A060-02

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 - NLT 325 - 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.

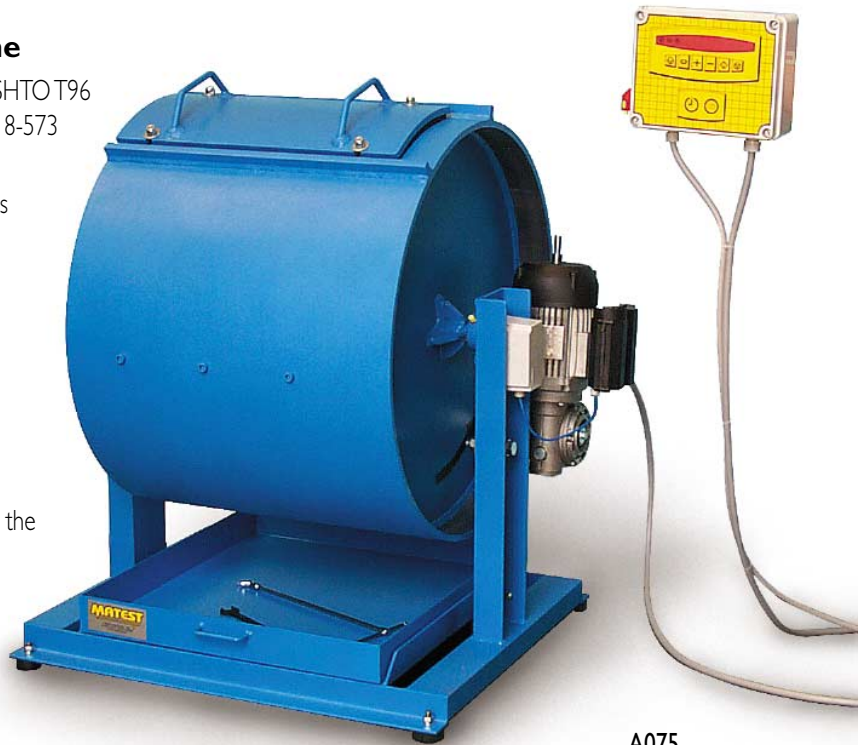
The machine is fitted with an automatic digital counter which can be preset to the required number of revolutions of the drum.

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

Power supply: 220-240 V 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, safety microswitch and 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



A078

Micro-Deval testing machine

STANDARDS: NF P18-572 - LCPC - UNE 83115
EN1097-1 - 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 resolution's 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, safety microswitch and 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.



A078-12

A078-15



A078-01



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

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, safety microswitch and sound-proofing material for noise reduction. Dimensions: 1650x650x1400 mm

Weight: 180 Kg



A079-02



A080

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 dia. 16x600 mm long.

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



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

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

A083

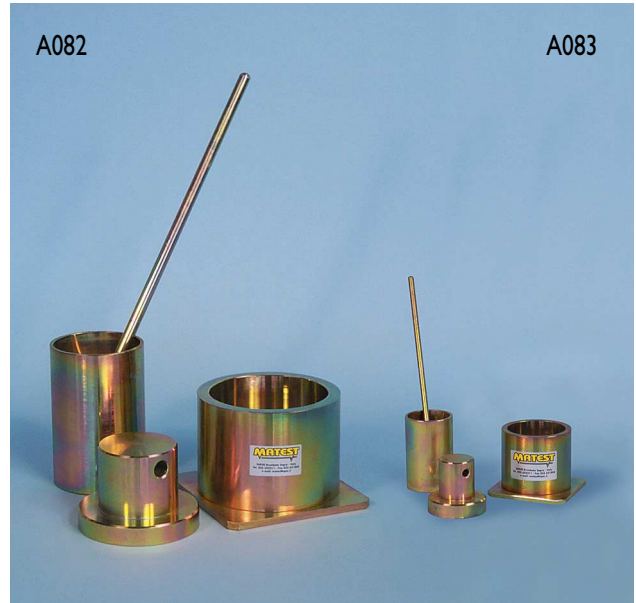
Aggregate crushing value apparatus dia. 75 mm

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

A085

Quartering canvas (not illustrated)

STANDARD: ASTM C702 - Method B

Used in field quartering soil and aggregates.
Size: 140x140 cm
Weight: 1 Kg

A084



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 fitted with a siphon tube at 250 mm from bottom. Weight: 3 Kg

A086





A091

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 A091.

Complete with steel cabinet to 89/392/CEE Directive.

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

Dimensions: 450x1000x620 mm

Weight: 115 Kg



A092

A092-01

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

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: 220-240V 50 Hz 1ph 750W

Dimensions: 700x700x1200 mm

Weight: 130 Kg

A093-02

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

Dimensions: 850x800x1300 mm

Weight: 160 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

Jar mill

Designed to reduce to powder any sort of granulometric material (clinker, cement, stones, hard materials) for general purpose laboratory tests.

Jar is in prokorund material with relevant hard porcelain spheres

Steel cabinet and microswitch to 89/392/CEE Directive.

Built in timer: Supplied complete. Rpm: about 400

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

Dimensions: 350x710x410 mm

Weight: 50 Kg



jars detail

MODELS:

A091 Jar mill,

with jar capacity of 300 g

A091-01 Jar mill,

with jar capacity of 1000 g

A091-02 Jar mill,

with jar capacity of 1500 g



A092-01

A095



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: 220-240 V 50 Hz 1ph 200W

Dimensions: 370x500x300 mm

Weight: 31 Kg

SPARE PART:

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

A102



A102

Bottle roller

STANDARDS: BS 812 - ASTM C117

To rotate two bottles or jars simultaneously about their longitudinal axis at 80 rpm.

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

Dimensions: 600x350x220 mm

Weight: 20 Kg

A104

Ultrasonic cleansing bath

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

Capacity: 10 litres

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

Internal diameter 260 mm - height 180 mm

Supplied complete with lid.

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

Weight: 8 Kg

A104-01

Ultrasonic cleansing bath

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

Capacity: 25 litres

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

Weight: 16 Kg

ACCESSORY:

A104-02

CLEANSING LIQUID for ultrasonic bath, 25 litre can.



A104

A106



A106

Melting pot, used to melt wax and other materials, it maintains heat from room temperature to max. 190°C. Complete with adjustable thermostat.

Capacity: 3 litres

Power supply: 220-240 V 50 Hz 1ph 1000W

Weight: 6 Kg

ACCESSORY:

V300-19

PARAFFIN WAX, for general laboratory use, having melting point at 50-54°C. Pack of 1 Kg





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

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: 220-240 V 50 Hz 1ph 300W

Dimensions: 400x700x500 mm

Weight: 38 Kg

A109



A112



A112

Tribometer - Abrasion tester

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

Used to determine the resistance to abrasion and wear of cement, concrete and similar materials, 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.

Supplied complete with accessories and safety cabinet to 89/392/CEE Directive.

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

Dimensions: 450x420x800 mm

Weight: 125 Kg



A110

Skid resistance tester

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

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.

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, 6 Kg pack

A128-03 Flour Emery ungraded, 6 Kg pack

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

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 antivibration 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: 220-240 V 1 ph 50 Hz
Dimensions: 800x700x1100 mm - Weight: 200 Kg



A116

End-Over-End shaker

STANDARD: BS 1377

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

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

Weight: 20 Kg

A116-01

End-Over-End shaker, same to mod. A116, but equipped with steel cabinet and safety microswitch to 89/392/CEE Directive.

Weight: 28 Kg

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

A111



section A



29



A122

Barton comb profilometer

Used for the evaluation of the surface roughness.

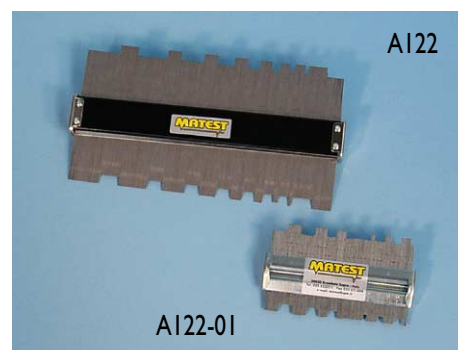
This simple device, 300 mm long, allows to a myriad of very thin steel wires to perfectly lay to the outline of the sample under test, so to allow its analysis.

Dimensions: 300x120 mm

Weight: 1 Kg

A122-01

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



MATEST

C38I

Rock classification Hammer

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

C38I



A12I

ACCESSORY:

A12I

ROCK CRADLE, to locate NX core rock specimens during the classification tests by the Rock Hammer mod. C38I.

Weight: 10 Kg

C35I

Specimen cutting machine, Bench Type, to cut rocks, stones, concrete, steel, etc.

The machine accepts blades up to dia. 355 mm

Shear capacity: 120 mm

Blade rotation speed: 3900 rpm

Power supply: 220-240 V 50 Hz 1ph 2000W

Dimensions: 560x460x390 mm

Weight: 20 Kg

C35I



ACCESSORY:

C350-03

DIAMOND BLADE dia. 350 mm

NOTE: Further models of cutting machine described at pag.

Index of velocity of rocks:

Ultrasonic pulse velocity tester:

See section concrete mod. C368 - C370

C368



A125



A125

Point load tester

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 loads are directly recorded on two gauges having dia.

150 mm and ranges: 0 - 5,5 KN div. 0,1 KN and 0 - 55 KN div. 1 KN.

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: 600x340x560 mm

Weight: 30 Kg

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 concrete, mod. C094, pag. 102)



A124

Filler compaction apparatus

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

Used to determine the void content of dry compacted filler:

The apparatus consists of:

- cylinder having inside dia. 25 mm
- graduated plunger freely sliding into the cylinder but without lateral play
- metallic base 150x100 mm holding the whole.

Weight: 4 Kg



A124

A129

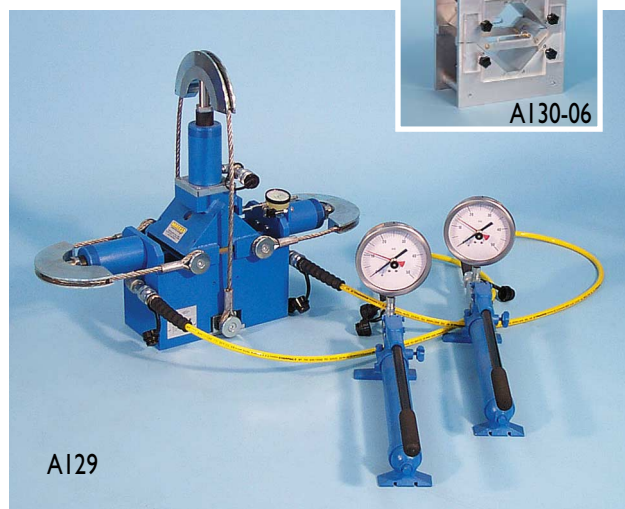
Portable rock shear box assembly

Used to determine the strength and slope stability of rock size max 110x125 mm or cores max. dia. 102 mm

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

Dimensions: 600x250x460 mm

Weight: 46 Kg



A129



A130-06

ACCESSORIES:

A130-01 3 kN Load Gauge, 0,05 kN div.

A130-02 5 kN Load Gauge, 0,1 kN div.

A130-03 11 kN Load Gauge, 0,2 kN div.

A130-04 25 kN Load Gauge, 0,5 kN div.

A130-05 British Gypsum Crystacal Plaster, for casting specimens into mould assembly, 50 Kg bag.

A130-06 Mould former, to prepare the specimen in the dimensions and geometry as requested by the shear box

A130-07 PRESSURE MAINTAINER, complete with foot pump, to allow a constant load to be maintained during the test.

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 concrete (pag. 123)



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.



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



MODELS :

	Specimen Dia. x height	Size	Load spreader pads (pair)	Spare spherical seat + piston	Spare Jacket	Core drilling barrel 400 mm long	Adaptors set for extruder
A136	30,10x 60 mm	AX	A136-01	A136-02	A136-03	A136-04	A141-01
A137	38,10x 75 mm	1,5"	A136-01	A137-02	A137-03	A137-04	A141-02
A138	42,04x 85mm	BX	A136-01	A138-02	A138-03	A138-04	A141-03
A139	54,74x100mm	NX	A136-01	A139-02	A139-03	A139-04	A141-04

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

Core drill (bench model), to obtain cores from irregular rock samples. To be used with the Core Drilling Barrels (accessory mod. A136-04÷A139-04).

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

Power supply: 220-240V 50 Hz 1ph

Weight: 50 Kg approx.



A136-04

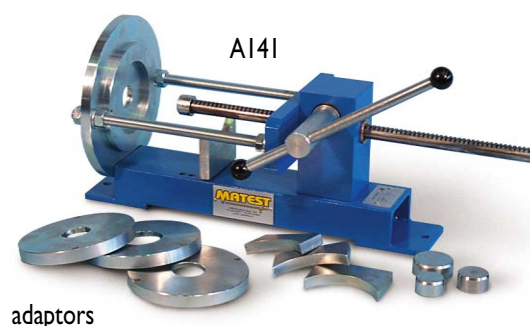
A141

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



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:

A130-07

Pressure maintainer; complete with foot 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



A145

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

The unit is supplied without the pressure gauge.

Power supply: 220-240 V 50 Hz 1 ph

Weight: 20 Kg

ACCESSORY::

A145-01 Pressure gauge 0 - 3500 kPa



A145

S275

A136-05

A136



Section B

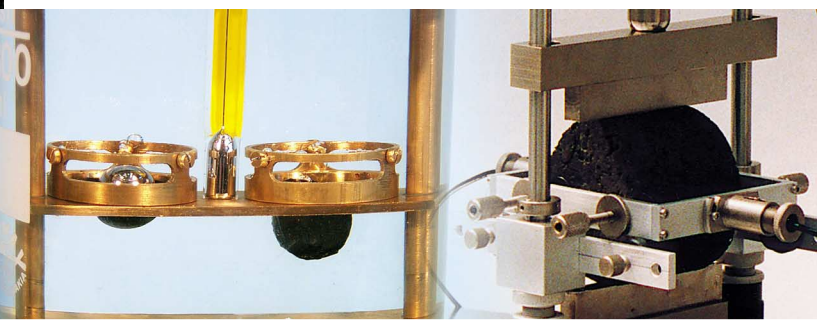
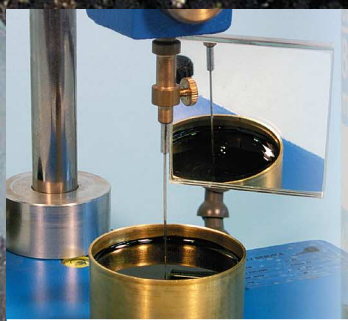
BITUMEN - ASPHALT

The use of bituminous materials is mainly addressed to roads construction.

The asphalt, named also bitumen, is mainly composed by aggregates and binder, with an infinite variation of mixtures.

It is therefore necessary to get suitable equipment to perform different test methods and to determine: binder content, internal friction, cohesion, consistency, softening point, viscosity, quality of aggregates, voids percentage, Marshall test, and many other parameters.

The equipment described in this Section largely satisfies all these test procedures.



Index section BITUMEN - ASPHALT

	Mod.	Page		Mod.	Page
Air bath	B016.....	39	Mixers, bitumen	B025.....	41
Asphalt content, furnace	B005.....	36	Mot straight edge	B099.....	65
Asphalt Testing Apparatus, Matta.....	B049.....	50	Moulds, Marshall	B029.....	42
Bacon sampler	B060.....	57	Oven, loss on heating, thin film	B064.....	58
Bath, air	B016.....	39	Oven, rolling thin film	B066.....	59
Baths, bitumen	B050.....	47	Pavement density meter.....	B110.....	67
Benkelman beam apparatus	B100.....	66	Penetrometers	B056.....	56
Binder, automatic extraction	B008.....	37	Pensky Martens tester	B094.....	64
Breaking point, Fraas	B077.....	61	Percentage refusal, PRD	B097.....	65
Cabinet with aspirator.....	B079.....	61	Permeameter, bitumen	B024.....	40
Centrifuge extractors	B011.....	38	Plate bearing test	B101.....	66
Cleveland flash point tester	B085.....	63	Pycnometer, 10 litres, vacuum	B067.....	48
Compactors, Marshall	B033.....	43	Recovery solvent still	B021.....	40
Cut back asphalt, distillation	B069.....	59	Redwood viscometer	B083.....	62
Dean Stark	B076.....	61	Reflux extractor	B019.....	39
Density meter "non nuclear"	B110.....	67	Residue of specified penetration.....	B062.....	58
Distillation of cut-back-asphalts.....	B069.....	59	Ring and ball apparatus	B072.....	60
Ductilometer	B054.....	55	Rolling thin film oven	B066.....	59
Duriez, moulds	B095.....	65	Sampler, Bacon	B060.....	57
Emulsified asphalt distillation	B063.....	57	Saybolt viscometer.....	B087.....	63
Engler viscometer.....	B080.....	62	Softening point	B072.....	60
Extraction of binder	B014.....	38	Solvent recovery still	B021.....	40
Extruder, Marshall moulds	S114.....	43	Tag closed and open viscometer.....	B092.....	64
Fatigue testing of asphalt beams.....	B049-30.....	53	Tar (Redwood) viscometer.....	B083.....	62
Flash and fire tester, Cleveland	B085.....	63	Thin film oven	B064.....	58
Fraas apparatus	B077.....	61	Universal UTM-5P testing machine	B049-10.....	51
Furnace, ignition method	B005.....	36	Universal UTM-25 testing machine.....	B049-20.....	54
Gyratory compactor, Servopac	B048.....	49	Vacuum pycnometer 10 litres.....	B067.....	48
Hot extraction apparatus	B017.....	39	Vialit binder adhesion tester	B053.....	54
Hubbard-Carmick bottles	V111.....	64	Viscometer, Engler.....	B080.....	62
Kumagawa extractor.....	B061.....	40	Viscometer, Saybolt	B087.....	63
Ignition method, furnace	B005.....	36	Viscometer, Tag closed/open.....	B092.....	64
Loss on heating oven	B064.....	58	Viscometer Tar (Redwood, BRTA)	B083.....	62
Marshall compactors	B033.....	43	Water bath, Marshall	B050.....	47
Marshall load frames	B042.....	44	Water bath, for penetrometer	B058.....	57
Marshall moulding equipment	B029.....	42	Water in bituminous materials	B076.....	61
Marshall water baths	B050.....	47	X-Y stability/flow software	B043-01.....	45
Matta, Asphalt Testing Apparatus.....	B049.....	50			



B005

Asphalt content furnace ignition method

STANDARDS: ASTM 6037 - AASHTO TP53 - NCAT (National Centre for Asphalt Technology) BS (DD)

section B



B005

The unit provides asphalt content of bituminous paving mixtures accurate to 0.11%, with a fast, accurate, environmentally friendly, and cost effective method of determining asphalt content.

Ignition method reduces testing time when compared to solvent extraction. A 1200-1800 gram sample of asphalt can be tested in 30-45 minutes using this Content Furnace.

Unit can accommodate samples up to 5000 grams!

MATEST Furnace has an internal scale, that automatically monitors the sample weight throughout the ignition process, saving valuable technician time and increasing productivity in the lab.

The ignition method replaces the costly and time consuming solvent extraction method by eliminating the primary cost of solvent purchase and the secondary cost of solvent disposal.

MATEST Content Furnace eliminates the exposure of the asphalt technician to harmful solvents. The automatic door-lock feature prevents opening the chamber door during the critical test time. This feature provides operator safety and helps ensure testing integrity. This Content Furnace is the only system on the market containing a high temperature afterburner used in conjunction with a patented ceramic filter to reduce the emissions of the ignition process by up to 95%. Our System has the capability to accept positive or negative correction factors for use with mixes containing hydrated lime. This unique furnace automatically detects endpoint within .01% of the sample weight. Furnace software allows you to choose between automatic and manual test mode. In the automatic mode, the endpoint is detected; the software ends the test, prints out the results and beeps. In the manual mode, the endpoint is

detected; the unit begins to beep but will continue to test until the user presses "stop" to end it. Once the "stop" button has been pressed, the door will unlock and the results will be printed.

Furnace software automatically compensates for weight change due to sample and basket assembly temperature change. This compensation is computed for each sample load tested, unlike competitive models that assign a fixed number to a given range of load sizes. An RS232 port provides data interface with personal computer for graphical data analysis. The Furnace is supplied complete with 4 baskets, 2 trays, 2 covers, handle, cooling cage, insulated plate, gloves, face shield, 4 rolls of printer tape.

Overall dimensions: 552x654x933 mm

Chamber Dimensions: 355x355x355 mm

Power supply: 220-240 V 1 F 50 Hz 4800 W 20 A

Temperature range: 200-650°C

Weight: 120 Kg

B005 - accessories





B008

Automatic binder extraction unit

STANDARDS: CNR A.VII N °38 - DIN 1996 - ASTM D2172

Used to perform reliable analysis on bituminous mixtures utilizing non-flammable non-explosion solvents, for quantitative determination of binder or bitumen contained in pavement samples and hot mixed mixtures.

The system performs in only one complete automatic cycle:

- the washing, disaggregation and separation of the bituminous mixture;
- the separation of the filler from the solution formed by solvent, bitumen and filler;
- the recovery and distillation of solvent material allowing a further utilization.

This unit, in a short time, performs out a serie of analysis that normally require a long time and labour; by reducing extraction costs. Furthermore the system largely reduces the emission of toxic fumes in the laboratory and avoids the manipulation of solvents to the operator.

The unit comprises:

- An electromagnetic sieving unit, insuring high quality double vibrating action (vertical/rotational) and suitable to accept up to 8 sieves dia. 200 mm., height 50 mm. The unit is foreseen of solvent spraying cover for washing and disaggregation of the sample. The sieving unit is mounted over the centrifugal unit and the washing solution is directly poured into the rotating beaker of the centrifuge.
 - A continuous flow filterless centrifuge having rotation speed of 11000 rpm equipped with a stainless steel beaker dia. 120 mm., filler capacity approx. 400 g, for a very fast and accurate extraction.
- The residual solution is directly poured into the solvent recovery unit.

- A solvent recovery unit having reclaiming capacity of approx. 50 l/h, equipped with cooling system foreseen of devices switching ON and OFF the unit to fully automatically perform the test.

The recovery unit is additionally equipped with devices for automatic controls and alarms of the functions, promptly signaling any anomaly or failure allowing the operator a quick intervention without altering the test.

- A separate control panel allows to program all these functions in a fully automatic system. It is also possible to select the manual function allowing to activate each specific function previously analyzed.

This unit is supplied complete with:

- Two stainless steel beakers dia. 120 mm
- Four stainless steel sieves dia. 200 mm openings: 0,075 - 0,250 0,800 - 1,6 mm
- One Sieve Frame only dia. 200 mm. to improve the capacity of the first sieve.
- Set of O ring gaskets for sieves.

Sieves with different openings are available on request.

A complete extraction cycle is performed ot in approx. 25 minutes and the max. quantity of mixture per extraction is 3500 g

Power supply: 240/400 V 3 ph 50 Hz 5,5 kW

Overall dimensions: 1400x680x1820 mm

Total weight: 185 Kg

SPARES:

B008-01

Stainless stell Beaker dia. 120 mm

B008-02

Sieve dia. 200 mm water seal with O ring gasket (when ordering please specify mesh opening).





B011

Centrifuge extractor 1500 g capacity

STANDARD: ASTM D2172 - AASHTO T164 - CNR N° 38

Used for the determination of bitumen percentage in bituminous mixtures.

It consists of a removable, precision machined aluminium rotor bowl and cover, housed in a cylindrical aluminium box. The electronic card automatically drives the bowl speed rotatorion ramp from 0 to 3000 rpm (3600 rpm with 60 Hz motor) as requestes by Standards, with automatic fast stop bowl rotation at the end of the test.

The centrifuge is supplied complete with pack of 100 filter disks.

Power supply: 220-240 V 1ph 50/60 Hz 250 W

Dimensions: 580x300x480 mm

Weight: 45 Kg

B011-01

Centrifuge extractor 1500 g capacity

Similar to mod. B011, but with safety micro-switch preventing the aluminium box opening when the machine is working, conforming to the 89/392/CE Directive.



B011 - B012

B012

Centrifuge extractor 3000 g capacity

Basically similar to mod. B011, but with the aluminium rotor bowl and cover having 3000 g capacity, to accept bituminous mixtures of larger dimensions. Weight: 47 Kg

B012-01

Centrifuge extractor 3000 g capacity

Similar to mod. B012, but with safety micro-switch preventing the aluminium box opening when the machine is working, conforming to the 89/392/CE Directive.

SPARES:

B011-11 FILTER DISKS for B011 centrifuge. Pack of 100 pieces

B011-12 BOWL AND COVER 1500 g capacity, cast aluminium made.

B012-11

FILTER DISKS

for B012 centrifuge.
Pack of 100 pieces.



B012-12

BOWL AND COVER 3000 g capacity, cast aluminium made.

B014

Continuous flow filterless centrifuge

STANDARDS: DIN 1966 - CNR N° 38 - ASTM D1856

Designed for quick filterless separation of filler from binder solution or other mixtures containing sediments (cement, soil, clay), in suspension. As no filter is required, there is no dispersion of material so that the highest accuracy is assured. The solution is poured into the top funnel and falls into the rotating test container dia. 70x200 mm. Because of the centrifugal effect, the liquid rises vertically leaving the filler and mineral particles inside the beaker. The centrifuge is supplied complete with aluminium beaker, two sieves 0,149 mm. and 0,074 mm. mesh respectively. The rotation speed is 11500 rpm, with automatic ramp and preset speed control. Extraction capacity is up to 100 g. of filler per test.

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

Dimensions: 350x600x720 mm.

Weight: 60 Kg

SPARE:

B014-01 ALUMINIUM BEAKER 70 mm. dia. x 200 high

ACCESSORY:

V300-26 THRICHOROETHYLENE SOLUTION to use with centrifuges B011 - B012 - B014
Can of 40 kg



B014



B016

B016 Air bath

Used for softening bitumen before performing a range of tests including ductility, flash point, penetration, loss on heating.

Inner vessel, stainless steel made, has 600 g. capacity.

Complete with thermoregulator; pilot lamp.

Power supply: 220-240 V 1 ph 50-60 Hz 300 W

Dimensions: 140x140x350 mm

Weight: 5 Kg

B017 Hot extraction apparatus

STANDARDS: CNR a.VII N° 38 - DIN 1996

This apparatus consists of a cylindrical glass jar containing a stainless steel wire basket cloth opening 0,074 mm. The asphalt sample (max. quantity 4000 g) is placed inside the wire basket, the solvent is poured inside the jar. Now the wire basket is inserted into the jar which is covered by the metal condenser connected to a water supply. The apparatus is placed on a hot plate and the boiling solvent drips into the basket dissolving out the bitumen. The filler passing through the mesh basket must be separated using the centrifuge extractor.

Dimensions: dia. 160x335 mm

Weight: 5 Kg



B017

V200

ACCESSORIES:

B017-02 Wire basket stainless steel cloth opening 0,4 mm

B017-04 Wire basket stainless steel, double cloth 0,074 and 0,4 mm. openings.

V200 Hot plate dia. 185 mm
220-240 V 1 ph 50-60 Hz 1200 W

V173-03 Iron wire gauze with ceramic centre

SPARES:

B017-01 Wire basket stainless steel cloth opening 0,074 mm

B017-03 Pyrex glass jar

B017-05 Metal condenser with ring

B019

Reflux extractor 1000 g capacity

STANDARDS: ASTM D2172 - AASHTO T164

This simple apparatus, working on the same operation principle of the mod. B017, consists of a cylindrical glass jar containing a metal frame supporting two metal cones of stainless steel cloth and a metal condenser on top of the jar. After placing the asphalt sample on both cones and pouring the solvent into the jar, the apparatus is placed on a hot plate. The solvent boils and drips first into the top cone, then into the lower cone dissolving out the bitumen.

Supplied complete with 100 filter papers and wire gauze.

Dimensions: dia. 160x510 mm - Weight: 5 Kg

SPARES:

B019-01 Filter paper; pack of 100

B019-02 Pyrex glass jar



B019

V200

B020

Reflux extractor 4000 g capacity

Similar to mod. B019 but having 4000 g capacity.

Dimensions: dia. 280x510 mm

Weight: 9 Kg

SPARES:

B020-01 Filter paper; pack of 100

B020-02 Pyrex glass jar





40

B021

Solvent recovery still - 10 litre/hour

This efficient and compact unit, easy to install, is totally self contained. It is provided of two tanks: one for the clean solvent and one for the dirty solvent and of a water coolant system which only needs to be connected to a tap. A safety cut out is also supplied, being activated when the solvent level becomes too low or once the process is completed. Fully stainless steel made.
Power supply: 220-240 V 1 ph 50-60 Hz 1300 W
Dimensions: 320x400x650 mm
Weight: 17 Kg



B021

B024

Permeameter

STANDARD: MPW OF BELGIUM

Mainly used in situ to perform and to check the permeability and drainage on road carpets, concrete pavements, tamped earth etc. The test consists in filling the cylinder with water, after hermetically positioning it on the carpet under test and then in calculating the time needed by a certain quantity of water to be absorbed by the same. The instrument is composed of a bottomless plexiglass cylinder 140 mm diameter, fitted on a base. The cylinder is calibrated from 0 to 4000 cc with 100 cc division.
Dimensions: 260x260x425 mm
Weight: 8 Kg



B024

B024-01

ACCESSORY:

B024-01

Weight Kg 5, anular shape, to apply on the base of the permeameter, to improve its adherence to the material under test.

B061

Kumagawa extractor 1 litre capacity

STANDARD: LCPC

Used to extract the bitumen from mixtures. Consisting of an electric heating device, balloon 1000 ml. capacity, glass pipes, cooling unit and 25 filtering cartridges.
Power supply: 220-240 V 1 ph 50/60 Hz 750 W

B061-01

Kumagawa extractor 2 litres capacity

Basically similar to mod. B061 but 2 litres capacity.

SPARES:

B061-02

FILTER CARTRIDGES, dia. 58x170 mm for Kumagawa 1 litre. Pack of 25 pieces.

B061-03

FILTER CARTRIDGES dia. 80x200 mm for Kumagawa 2 litres. Pack of 25 pieces.



B061

B061-01

B061-02



B025

Mixer 20 litres capacity

STANDARD: BS 598:107

This large capacity mixer has been designed to mix bituminous samples for compaction tests and for other tests where uniformity is required. Thanks to the planetary action this mixer ensures a complete and uniform mixing. The machine is provided with a variable speed drive allowing to set different speeds. The plastic cover can be lifted to inspect the bowl, and in this case the motor automatically turns off to prevent accidents to CE safety Directive. The mixer is supplied complete with hook beater and stainless steel bowl, but without the insomantle electric heater that must be ordered separately.

Power supply: 400V 50 Hz 3 ph 0,5 HP (230V 1 ph on request)

Dimensions: 260x760x860 mm - Weight: 160 Kg

B026

Large capacity mixer

Similar to mod. B025 but having 40 LITRES CAPACITY



ACCESSORIES:

B025-01 Isomantle electric heater, complete with thermoregulator
Power supply: 220 - 240V 1 ph 50-60 Hz 1000 W

B025-02 Beater

B025-03 Whisk beater

B025-04 Spiral beater

SPARE: **B025-05** Hook beater



B028-02



B028-01

E094

Mixer 5 litres capacity

STANDARD: BS 598:107

This bench mounting Mixer, is utilized for mixing samples of bituminous materials. Thanks to its double mixing action (shaft and planetary) it ensures uniform mixing.

Double speed selection (140 or 285 rpm).

The mixer is supplied complete with stainless steel bowl, but without beater or whisk to be ordered separately.

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

Dimensions: 450x400x480 mm Weight: 50 Kg



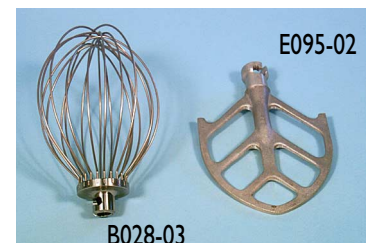
E095 + B028-03

E095

Mixer 5 litres capacity

Same to mod. E094 but equipped also of safety guards to 89/392/CEE Directives.

Note: The proper utilization of the mixers mod. E094 and E095 requires to heat the bowl with the bituminous sample at the temperature specified by the standards. To this purpose a common laboratory oven is used, and the sample mixing (time: approx 2 minutes) is carried out immediately after having taken off the bowl from the oven. As an alternative to this procedure the heaters mod. B028-01 and B028-02 can be used.



E095-02

B028-03

ACCESSORIES FOR MOD. E094 and E095:

B028-01 Electric Heater, complete with thermoregulator.
Power supply: 220 - 240V 1 ph 50-60 Hz 600 W

B028-02 Gas Heater, fixed directly on the mixer, only for extra CEE markets.

B028-03 Whisk Beater

E095-02 Aluminium Beater

SPARE: **E095-01** Stainless steel Bowl

Marshall testing equipment

STANDARDS: ASTM D 1559 - AASHTO T245 - DIN 1996
CNR N° 30 - NF P98-251-2

B029

Standard compaction mould consisting of mould body, base plate, filling collar. Inside diameter 4" (101,6 mm). Steel manufactured and plated against corrosion. Weight 5 Kg

SPARES:

B030 Compaction mould body only. Weight: 2 Kg

B030-01 Filling collar only. Weight: 2 Kg

B030-02 Base plate only. Weight: 1 Kg

ACCESSORIES:

B030-03

EXTRACTION PLATE. Used to eject specimens from the mould. It is used in conjunction with B030-04 receiver.
Weight: 2 Kg

B030-04

Specimen receiver; used to receive specimens ejected by the B030-03 extruder.
Weight: 3 Kg

B030-05 Paper disc dia. 100 mm. Pack of 100.

B032

Hand Marshall compactor

STANDARDS: ASTM D 1559
AASHTO T245
NF P98-251-2 - DIN 1996
CNR N° 30

This hand-operated machine compacts Marshall samples as described in the International Specifications.

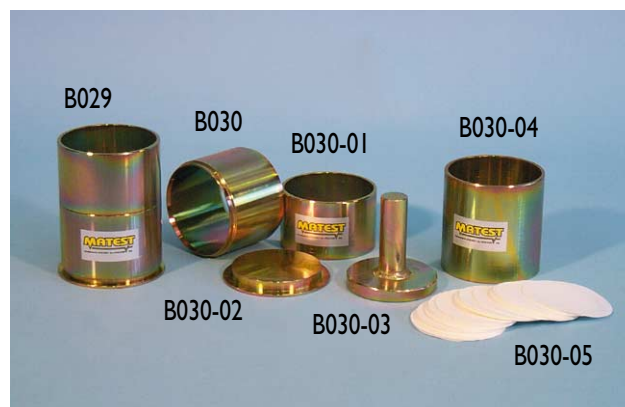
The moulds are held in position by a quick clamping device and they are easily inserted and removed from the compactor.

The apparatus consists of a wooden compaction base, a steel frame, a compaction hammer, plated against corrosion, guided on a shaft and a mould clamp device fitted on the steel frame.

The apparatus is supplied without the mould which must be ordered separately.
Dimensions: 320x320x1600 mm
Weight: 80 Kg



B032



SPARES TO B032 COMPACTOR:

B034

Compaction hammer with 4,53 Kg. sliding weight, guided on a shaft. Plated against corrosion. Weight: 10 Kg

B035

Compaction mould holder. Weight: 2 Kg

B036

Compaction pedestal, consisting of a wooden block, capped with a steel plate.
Weight: 30 Kg

B037

Hammer guide

PAVEMENT CORE DRILLING
See section "Concrete"
mod. C319.



C319



B037



B034



B036

B035

B033

Automatic Marshall compactor

STANDARDS: ASTM D1559 - CNR N° 30 - AASHTO T 245
NF P98-251-2 - DIN 1996

This ruggedly constructed machine has been designed to eliminate the laborious process of hand compaction. It automatically compacts the specimen and stops off the motor after the preset number of strokes has been completed on the automatic digital display counter. The trip mechanism is structured so that the hammer falls at the same height at every stroke. The unit incorporates a compaction wooden pedestal. The drive mechanism lifts the 4,53 Kg. compaction hammer, plated against corrosion, to the height of 457 mm. and allows free fall at 60 blows per minute. The compactor is supplied complete except for the mould which must be ordered separately.

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

Dimensions: 540x400x1600 mm

Weight: 95 Kg

B033-01

Automatic Marshall compactor

Similar to mod. B033 but equipped with safety guards to 89/392 CEE Directive.

ACCESSORIES:

B033-03

NOISE REDUCTION CABINET for B033 and B033-01 compactors inside lined with sound-proofing material for noise reduction to CE Directive.

B033-04

STEEL PLATE dia. 100x50 mm. to heat the Compaction Hammer.

SPARE:

B033-11

COMPACTION HAMMER, complete for mod. B033 and B033-01 machines

S114

Universal extruder

Hand operated, actuated by a 5 tons hydraulic jack, it is designed to extrude samples having dia. 4" and 6". It can therefore extrude Marshall, CBR, Standard and Modified Proctor specimens. Dimensions: dia. 300x500 mm Weight: 30 Kg



B033-01

B033

B033-02

Automatic Marshall compactor

STANDARD: BS 598:107

Basically structured as mod. B033 but manufactured in accordance with BS Standards. Supplied complete with concrete base, safety guards to CE Directive.

Dimensions: 600x600x1800 mm
Weight: 380 Kg



B033-02



Marshall compression frames

Available models:

- B042** Marshall mechanical load frame
- B043** Marshall digital load frame
- S212** Universal Multispeed load frame (page 214)
- S213** CBR/Marshall dual speed load frame (page 213)

section B

B042

Marshall mechanical 30 kN load frame

STANDARDS: ASTM D1559 - AASHTO T245 - BS 598:107
NF P98-251-2 - DIN 1996 - CNR N° 30

Ruggedly constructed with frame to encompass the strain and loads, easy to use, it is designed to operate with the minimum of maintenance.

Platen rate is 50.8 mm/minute also maintained under load thanks to an overpowered electric motor. The applied load is measured by a precision proving ring 30 kN capacity incorporating a stem brake holding the maximum reading and it is supplied with relevant calibration certificate. The machine includes:

Electric device for automatic stop when reaching the max capacity load of the proving ring, so as to prevent any overload damage.

Limit switches stopping it at max. and min. excursions.

The unit is supplied complete with load ring 30 kN capacity, stability mould flow meter with dial gauge.

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

Dimensions: 410x400x1110 mm

Weight: 110 Kg

SPARES:

B046

STABILITY MOULD

Open type having inside diameter of 4" (101,6 mm).

The mould is completely open in the front and the introduction of the specimen becomes very easy thus avoiding disassembling operations.

Weight: 6 Kg

B047

FLOW METER

Mounted on top of the stability mould, holding the dial gauge and incorporating a stem-brake keeping maximum deflection. Supplied without dial gauge.

Weight: 0,5 Kg

B047-01

DIAL GAUGE

Stroke 10 mm, div. 0,01 mm to be used in conjunction with the Flow Meter B047.

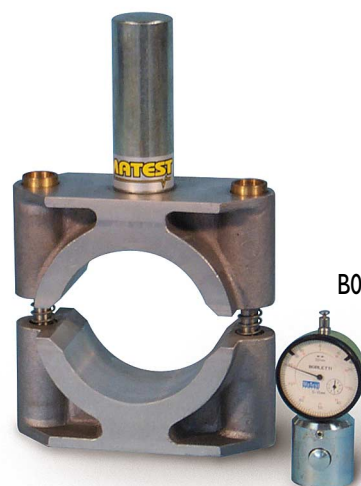
B042



B046

B047-01

B047





B043

Marshall digital 30 kN load frame

NORME: ASTM D1559 - AASHTO T245 - BS 598:107
NF P98-251-2 - DIN 1996 - CNR N° 30

The testing frame is the same as for mod. B042, but the load is measured by an electric cell with high precision strain transducers; the flow is measured by a displacement transducer 50 mm stroke and $\pm 0,1\%$ linearity.

The digital display unit with microprocessor (technical details: see mod. B044, pag. 46) measures and displays at the same time the stability in kN and the flow in mm with pick hold features with the possibility to transfer them to a PC and a printer through a RS232 port.

Supplied complete with Stability mould.

Power supply: 220-240V 1 ph 50 Hz 900 W

Dimensions: 650x400x1100 mm

Weight: 120 Kg

ACCESSORY:

B043-01

SOFTWARE FOR "X-Y" STABILITY/FLOW GRAPHICS

This program, working on Microsoft Windows, visualizes a load/deformation graphics with the possibility to modify the scales and to obtain relevant zooms in real time (during the test execution).

It is also possible to visualize:

- Instantaneous load (stability) and deformation (flow)
- stability/flow peak values
- test code, date, hour etc.

Among the main functions of the program:

- table for the graphics analysis, containing the load values (selectable by the operator) and relevant deformations
- menu for the personalization of the test certificate, containing: data, calculations, stability/flow graphics, 3 personalizing lines, set of zooms with titles definable by the operator.

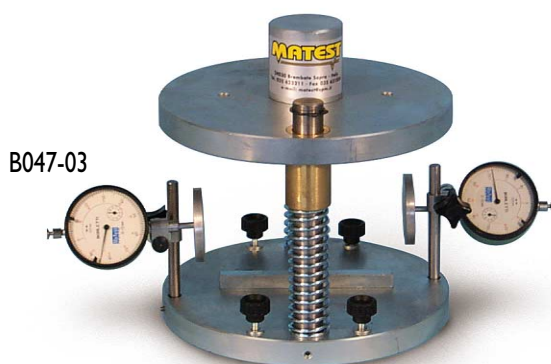
The part of graphics foreseen on the test certificate can be decided by the operator before printing it.

It is possible to print series of certificates showing graphics with different scales or zooms. For each certificate a name can be defined, allowing its identification and selection.

- Menu for filing on PC' HD of all created certificates, according to the operational Windows system, with the relevant advantages of the system.
- Menu for the displaying and printing of the certificates saved.



B043



B047-03

B047-02

ACCESSORIES FOR MOD. B042 - B043:

B047-02

Tensile splitting device

STANDARD: ASTM D4123

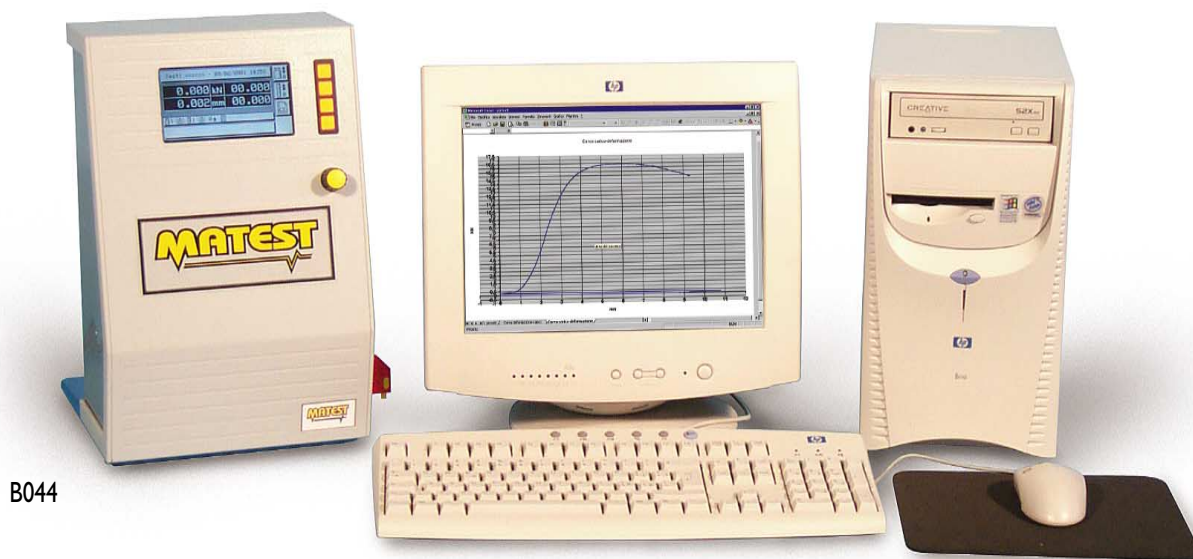
Utilized to measure the splitting tensile strength and the radial strain of a cylindric Marshall asphalt specimen dia 4" and dia 6", where a vertical load is applied. The device is equipped to perform splitting tests on specimens dia. 4" and 6", by utilizing a suitable load frame. Steel manufactured, plated against corrosion.

Dimensions: dia. 248x270 mm.

Weight: 14 Kg

B047-03

Set of two dial gauges 10 mm. stroke and 0,01 mm. sens. complete with adjustable supports for strain measurements.



B044

B044

Digital display unit with microprocessor

for use with:

- Marshall mechanical 30 kN load frame mod. B042
- CBR/Marshall two speeds load frame mod. S213
- Universal multi-speeds load frame mod. S212
- CBR loading machine mod. S211
- Triaxial load frame mod. S301

This dual channel unit displays at the same time the load and the deformation (stability and flow) measured by the electric load cell and the strain displacement transducer.

The digital unit with relevant accessories can be used on any type of existing machine (also from other manufacturers).

The software displays simultaneously the following data:

- year/month/day/hour
- Instant load in kN with 3 decimal points (\pm values)
- Instant deformation in mm with 3 decimal points (\pm values)
- Hold peak values of load and deformation with memorization
- Test code, symbols of pushbuttons functions, informative messages (planning, alarms, load cell and strain transducer setting, etc.)
- Graphic display of large size
- Operator interface through 4 multi-function pushbuttons + selection encoder
- Memory recording of load and deformation peak values for 10 tests and displaying
- Possibility to modify the test code (before the test)
- Safety function for automatic machine stop at max. reached load
- Safety function for automatic machine stop at max. reached deformation of the strain transducer
- Calibration program for each channel for the correction of any non-linear situation due to the load cell or to the load frame
- Memorization of 2 calibration tables for load cell and strain transducer
- Software in 3 languages: English, French, Italian

The digital unit can be connected to a PC through RS232 port for the transmission of the stability and flow values together with the test data (date, hour, test code etc.).

The operation manual of the unit foresees instructions with examples allowing the enduser to prepare a software to obtain the "X-Y" stability/flow graphics.

The realization of this program foresees the use of the "Hyper Terminal" functions included into Windows.

Power supply: 220-240 V 1 ph 50 Hz

Dimensions: 250x180x400 mm

Weight: 5 Kg

NOTE: Windows and Excel program needed for the data processing are not included.

ACCESSORIES:

B044-01

ELECTRIC LOAD CELL, 50 kN capacity, with high precision strain transducers, complete with cable and connector.

B044-02

DISPLACEMENT TRANSDUCER, 50 mm stroke, linearity: $\pm 0,1\%$ complete with cable and connector.

B043-01

SOFTWARE FOR "X-Y" STABILITY/FLOW GRAPHICS

Technical data: see pag. 45



Water baths for Marshall specimens

STANDARDS: ASTM D1559 - BS 598:107 - AASHTO T245
NF P98-251, 2 - DIN 1996 - CNR N° 30

Used to maintain in water Marshall specimens at constant temperature of $60 \pm 1^\circ\text{C}$ and asphalt specimens at $37,8^\circ\text{C} \pm 1^\circ\text{C}$. These baths are also ideal for general laboratory use.

MODELS:

B050

Standard water bath

The internal tank and cover are stainless steel made, outside box is from painted steel sheet with wool insulation.

The specimens are held by a stainless steel shelf spaced from the bottom.

Complete with analogic thermostat.

The bath is designed to hold up to 20 Marshall specimens.

Capacity: 46 litres

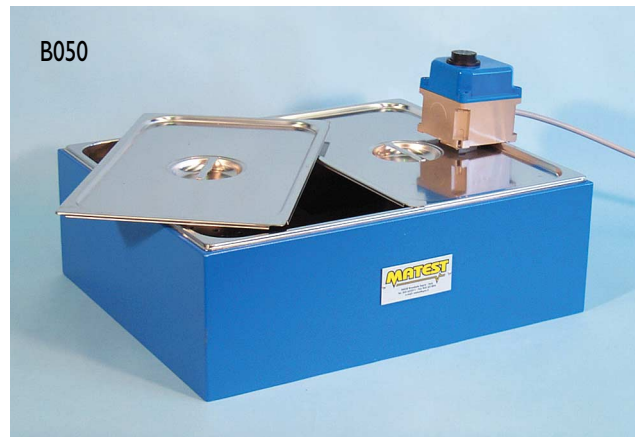
Temperature range: from ambient to 95°C

Inside dimensions: 615x505x150 mm

Outside dimensions: 660x540x230 mm

Power supply: 220-240 V | ph 50/60 Hz | 1500 W

Weight: 20 Kg



B050-01

Standard water bath

Same as for mod. B050, but equipped with digital thermostat ensuring better temperature accuracy.

B052

Digital water bath

High quality model, fully double walled stainless steel made with wool insulation. The specimens are held by a shelf spaced from the bottom. Complete with digital thermostat and electric stirrer, ensuring a constant and uniform water temperature of $60 \pm 1^\circ\text{C}$ or $37,8 \pm 1^\circ\text{C}$ as prescribed by the Standards.

The bath can hold up to 20 Marshall specimens

Capacity: 60 litres

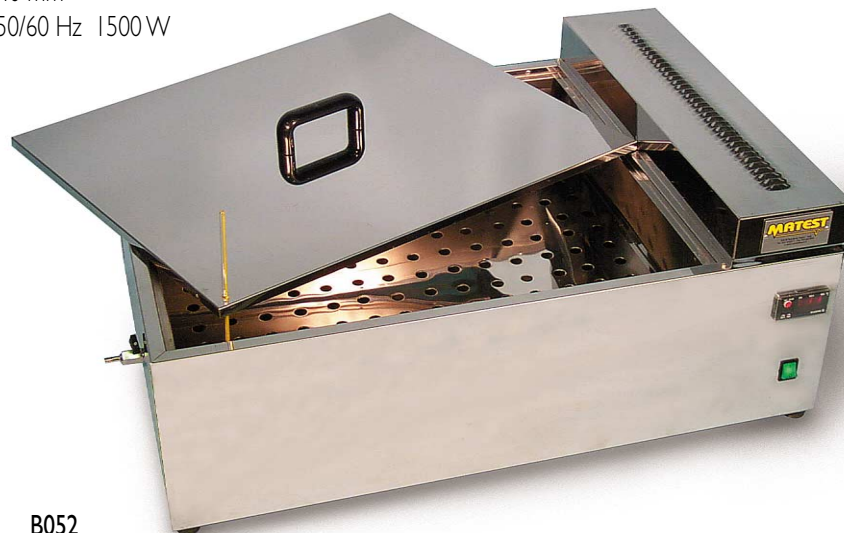
Temperature range: from ambient to 95°C

Inside dimensions: 700x550x165 mm

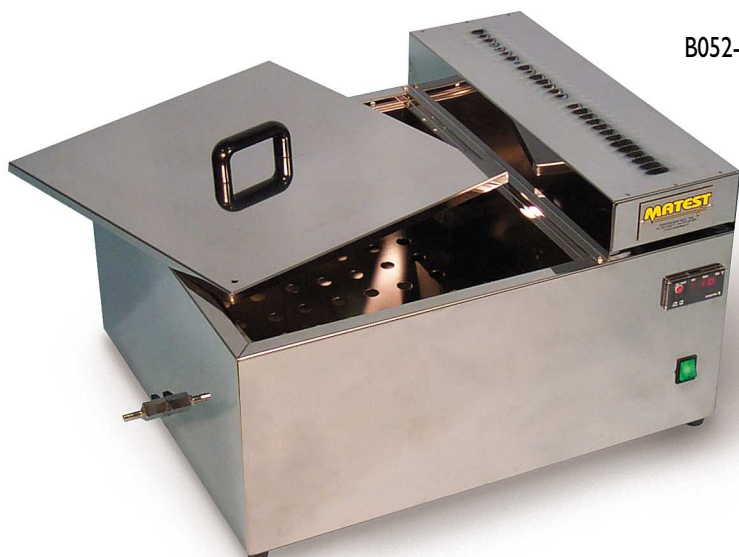
Outside dimensions: 900x640x340 mm

Power supply: 220-240 V | ph 50/60 Hz | 1500 W

Weight: 28 Kg



B052



B052-01

B052-01 **Digital water bath**

Identical to mod. B052 but:
Inside dimensions: 430x420x160 mm
Outside dimensions: 620x500x330 mm
The bath can hold up to 9 Marshall specimens
Capacity: 30 litres
Weight: 15 Kg

B052-02 **Digital water bath with cooling device**

Similar to mod. B052 but equipped with cooling unit housed under the water bath.
Temperature range from: + 5 to + 95 °C
The bath can hold up to 12 Marshall specimens
Capacity: 42 litres
Inside dimensions: 510x350x230 mm
Outside dimensions: 680x420x950 mm
Power supply: 220-240 V 1 ph 50/60 Hz 2000 W
Weight: 60 Kg

ACCESSORY FOR MOD. B050 ÷ B052-02

B052-10 Mercury control thermometer 0-100°C subd. 1°C



B052-02



B067

B067 **Vacuum pyknometer 10 litres capacity**

STANDARDS: ASTM D2041 - AASHTO T209, T283

Transparent plexiglass made, complete with valve and gauge, it is utilized for a rapid determination of asphalt content, bulk specific gravity of aggregates, the max. theoretic specific gravity of bituminous uncompacted road mixtures and the percent air voids in compacted mixtures.

Dimensions: dia. 300x450 mm

Weight: 10 Kg



B048

Gyratory compactor "Servopac"

STANDARDS: ASTM D6307 - AASHTO TP-4 - prEN 12697-31 - CEN TC227 - NF P98-252 - BS DRAFT

The Servopac is a fully automated, servo-controlled gyratory compactor designed to compact asphalt mixes using the gyratory compaction technique.

Compaction is achieved by the simultaneous action of static compression and the shearing action resulting from the mould being gyrated through an angle about its longitudinal axis.

The Servopac has a four column frame for superior rigidity. Vertical stress is measured by a load cell and is accurately controlled during compaction. The gyratory motion is also servo-controlled enabling the gyratory angle to be accurately controlled during compaction, irrespective of load and any compliance of the machine's components.

The Servo-controlled operation of the machine allows vertical stress, gyratory angle and speed to be quickly modified from a hand-held control pendant or PC

The PC-Windows (TM) interface provides a screen to input test parameters and display and plot either height, density, shear stress or angle against gyratory cycles in real time.

The test data may be stored and retrieved or transferred to other analysis packages.

The Servopac is designed to comply with SHRP Superpave asphalt mix design requirements and the proposed CEN European Specifications on gyratory compaction.



SPECIFICATIONS:

Vertical force: 0 to 20kN +/- 100N (with 1000kPa air supply)

Gyratory angle: 0 to 3 +/- 0.02 degrees

Gyratory rate: 3 to 60 +/- 0.1 gyrations per minute

Number of gyrations: 0 to 999

Minimum specimen height: 50 mm

Air supply capacity: minimum 5 litres/second of clean, dry air

Operating pressure: 800 to 1000 kPa

Power supply: 220-240V 1ph 50Hz

Dimensions: 760 x 450 x 1970 mm

Weight: 400 kg

The Servopac is supplied complete with stand, specimen extractor, software, mains power and PC communication leads, 100 and 150 mm wearing plates.

ACCESSORIES:

B048-01

Cylinder mould assembly 100 mm diameter

B048-02

Cylinder mould assembly 150 mm diameter

B048-03

Pendant Controller unit, utilized to re-calibrate the machine

B048-04

Servopac angle verification kit (shear stress measurement), including dial gauge

B048-05

Servopac calibration spacers kit for angle, load and vertical travel, including 5 spacers and 3 calibration gauges

V206

Laboratory Air Compressor

B048 + B048-02



B049

Asphalt testing system - MATTA

STANDARDS: ASTM D4123 - BS598:111 - BS DD 213, DD226

This apparatus is a general purpose testing machine developed to carry out a range of tests on asphalt. The emphasis has been on producing affordable systems with the versatility to perform both routine testing and detailed research investigations. The MATTA is based on a simple reaction frame comprising a steel base plate, support columns and crosshead. Cylindrical samples are positioned between the base plate and the crosshead, and an electro-pneumatic actuator is used

to exert dynamic compressive forces. Measurement of displacement and forces enables the resultant stress and strain in the sample to be determined. Jigs are provided to allow axial or diametral (indirect tensile) loading of samples.

The machine is controlled by a compact microprocessor based Control & Data Acquisition System (CDAS). All time-critical parameters are controlled

directly by the CDAS unit for reliability and accuracy. A temperature controlled cabinet is available (accessory) where accurate control of test temperature is required, as is the case when testing asphalt. Open-loop controlled 5-pulse Indirect Tensile Modulus to BS DD213 - ASTM D4123

Open-loop controlled Repeated Load Strain test to BS DD226

Open-loop controlled Static Load Uniaxial loading Strain to

BS598:111

The Pneumatic Actuator has 5kN capacity and 50mm stroke

The CDAS has 8 analogue input channels, and high acquisition sampling rate (up to 1000 readings per second)

The basic system includes: loading frame, pneumatic actuator and regulator, solenoid valve and load cell, CDAS.

Power supply: 220-240v

1ph 50/60Hz

Weight: 120 kg



B049 + B049-01

ACCESSORIES:

B049-01

INDIRECT TENSILE JIG for 100mm and 150mm diameter specimens, with transducers

B049-02

CREEP JIGS for 100mm and 150mm diameter specimens, with transducers

B049-03

STEEL PROVING RING calibration check device having nominal modulus of 2000 Mpa, used, to verify the accuracy of results from indirect tensile tests

B049-04

TORQUE SCREWDRIVER, used for indirect tensile tests

B049-13

ENVIRONMENTAL CHAMBER, stainless steel construction with glass door:

Temperature range: +2 to +60°C. 220-240V 1ph 50/60Hz

B049-14

ENVIRONMENTAL CHAMBER, stainless steel construction with glass door:

Temperature range: -15 to +60°C. 220-240V 1ph 50/60Hz

B049-15

Environmental chamber shelf & bracket assembly for temperature conditioning samples

NOTE: A compressor with a working pressure of 850kPa is required

B049-10

Universal testing machine UTM-5P

STANDARDS: ASTM D4123 , D3497 - AASHTO T294/SHRP P46
BS 598 , DD213, DD226

This Closed-loop pneumatic servo-controlled system allows asphalt to be tested for its ability to simulate repeated axial loading conditions, replicating traffic conditions.

It can also perform Static and Dynamic Creep tests giving measurements for Plastic Determination, and enables testing of to different types of asphalt and granular specimens.

The system comprises a loading frame fitted with a servo-controlled pneumatic actuator assembly, a personal computer (PC), a control and data acquisition system (CDAS) with 8 transducer inputs and housing an additional module that controls the servo-valve. One important feature of the CDAS unit is that the control and data acquisition functions are fully integrated. The user-friendly software can generate any desired loading waveshape that can be defined in 512 points.

The high performance pneumatic Servo-Actuator has 5 kN capacity, 30 mm stroke and it is suitable for high frequency loading (up to 70Hz sinusoidal).

Acquisition sampling rate: up to 1000 reading/sec.

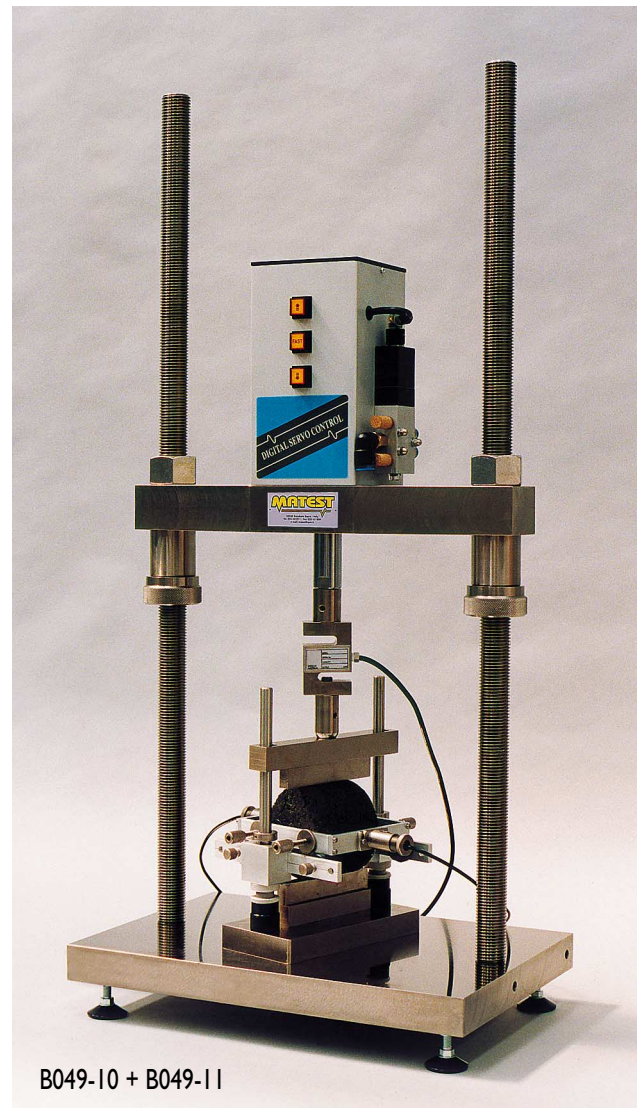
Three input channels for force, displacement and/or strain controlled loading.

Can simultaneously control up to 3 axes

The basis system includes: loading frame, 5kN double action servo-pneumatic actuator; 6kN load cell, closed-loop pneumatic reservoir assembly, filter; Control and Data Acquisition System (CDAS), Universal Testing Machine(UTM) and software.

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

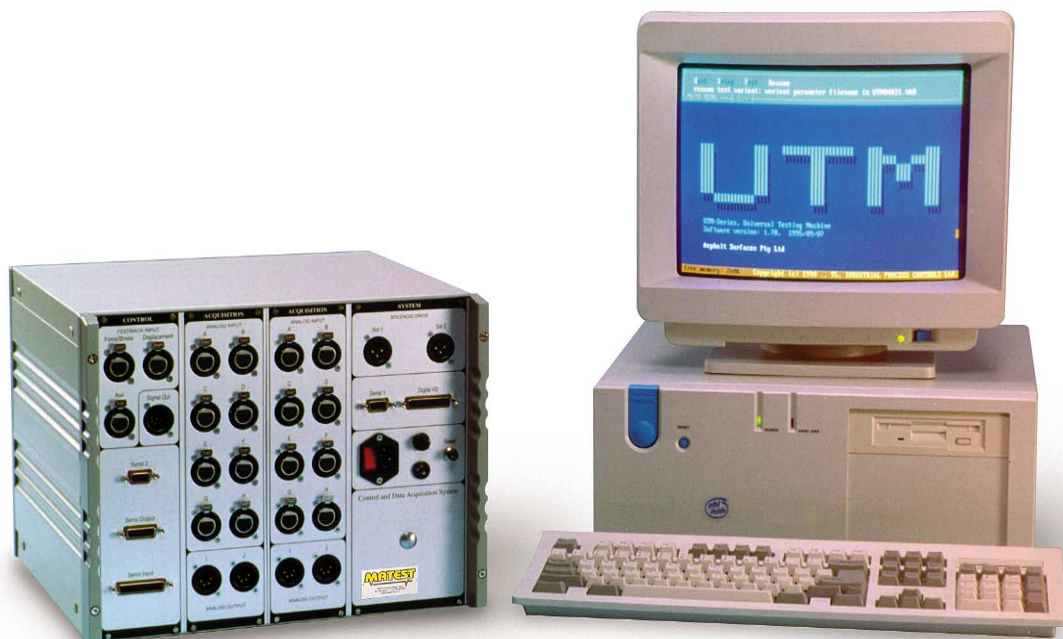
Weight: 120 kg



section B



51



VERSATILE HARDWARE

MATEST

ACCESSORIES:

B049-11

ASHPALT MATERIALS TESTING PACKAGE, comprising:
Indirect tensile jig for testing 100 and 150 mm diameter samples
Closed-loop temperature measurement kit
2 displacement transducers 5 mm stroke
2 displacement transducers 0,12 mm stroke
Creep testing jig for 100 and 150 mm samples

B049-13

ENVIRONMENTAL CHAMBER, stainless steel construction with glass door.
Temperature range: +2 to +60°C . 220-240V Iph 50/60Hz

B049-14

ENVIRONMENTAL CHAMBER, stainless steel construction with glass door.
Temperature range: -15 to +60°C. 220-240V Iph 50/60Hz



B049-12

ASHPALT BEAM FATIGUE TESTING PACKAGE, comprising:
Beam Fatigue Apparatus, on specimen displacement transducer; axial alignment adaptor;
cradle assembly, clamp kit, PVC beam dummy specimen. This is the same as our Stand-alone unit, but shares the CDAS from the UTM-5P.

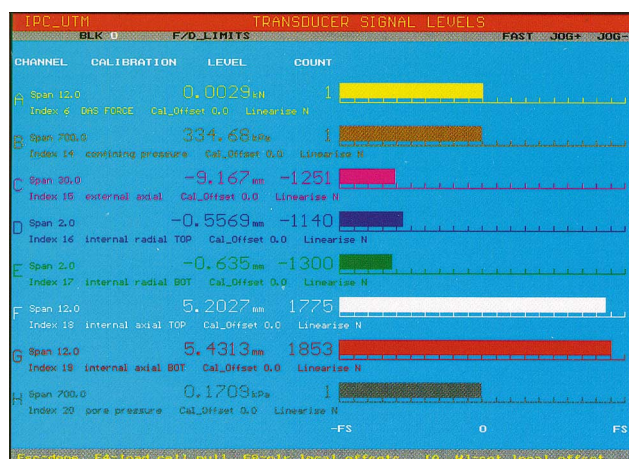
B049-15

Environmental chamber shelf & bracket assembly for temperature conditioning samples.

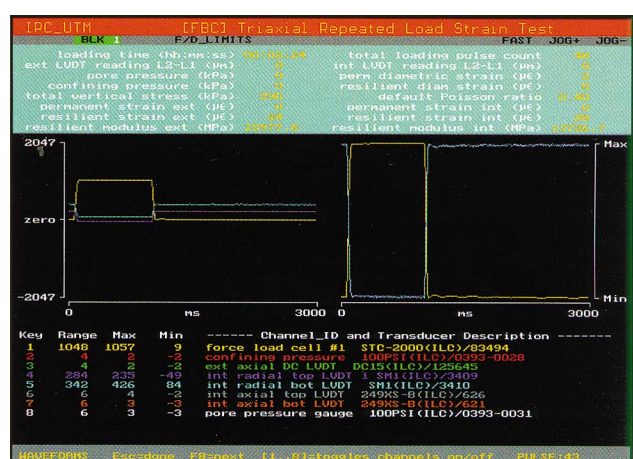
NOTE. A compressor with a working pressure of 850kPa is required

User friendly software

Display of transducer signal levels during setup.



Real time viewing of transducer outputs.



B049-30

Fatigue testing of asphalt beams

STANDARD: SHRP M009

The Beam Fatigue Apparatus is a stand-alone system for fatigue life testing of asphalt beams subjected to repeated flexural bending, giving a measure of maximum tensile strength, maximum tensile strain and flexural stiffness. The cradle mechanism allows for free translation and rotation of the clamps and provides loading at the third points. Pneumatic actuators at the ends of the beam centre it laterally and clamp it. Servo-motor driven clamps secure the beam at the four points with a predetermined clamping force. Software has been developed to automatically perform the SHRP M009 test. The latest software allows for both controlled strain and stress loading.

Load measurement and control:

- Range: ± 4.5 kN
- Resolution: 2.2 N
- Accuracy: ± 10 N

Displacement Measurement and Control:

- Range: ± 0.5 mm
- Resolution: 0.25 μ m
- Accuracy: ± 1.00 μ m

Loading frequency: up to 10 Hz sinusoidal loading

Sample size: 50 x 50 x 350 mm

50.8 x 63.5 x 381 mm (SHRP M009)

The system includes:

Stand alone Beam Fatigue apparatus, Control & Data Acquisition System assembly, Closed-loop pneumatic reservoir assembly, Servo cables kit, Software.

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

Dimensions: Beam Cradle 300 x 500 x 600mm

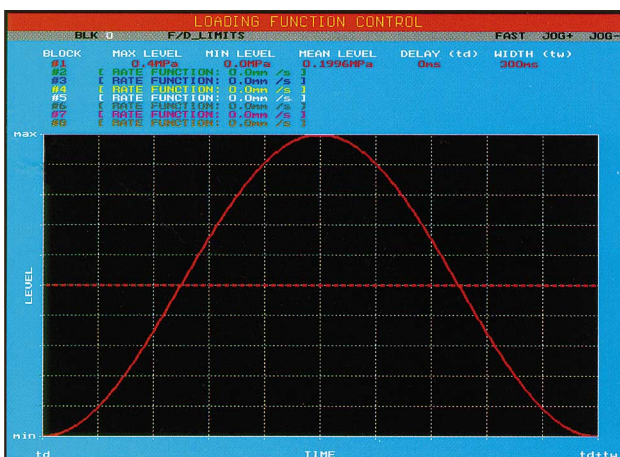
CDAS unit 400 x 450 x 330 mm

Weight: 40 kg

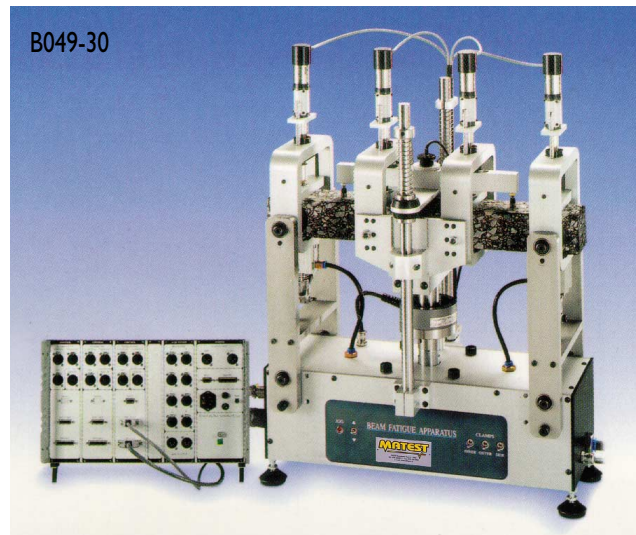
Programmable loading waveforms.

Comprehensive and flexible control modes including force, displacement and strain.

Programmable loading sequences allowing bumpless transfer.



B049-30



ACCESSORIES:

B049-31

PVC beam (BFA dummy specimen)

B049-13

ENVIRONMENTAL CHAMBER, stainless steel construction with glass door

Temperature range: $+2$ to $+60^{\circ}\text{C}$. 220-240V 1ph 50/60Hz

B049-14

ENVIRONMENTAL CHAMBER, stainless steel construction with glass door

Temperature range: -15 to $+60^{\circ}\text{C}$. 220-240V 1ph 50/60Hz

B049-15

Environmental chamber shelf & bracket assembly for temperature conditioning samples

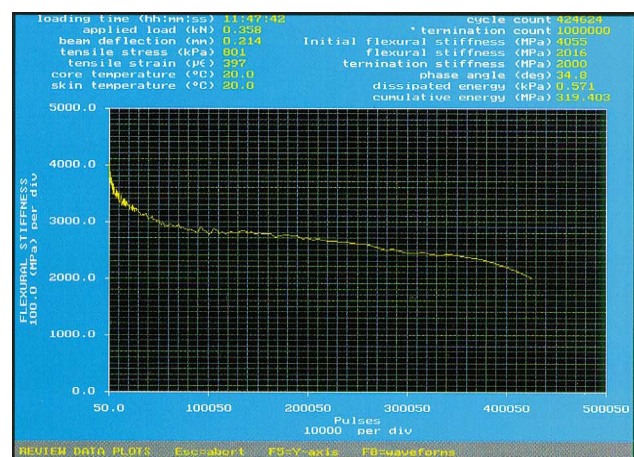
NOTE: A compressor with a working pressure of 850kPa is required.

Real Time Graphics.

Real time graphical plotting of selected parameters as the test progresses.

Fixed or auto scaling software.

Indication of machine status, limits and faults.



B049-20

Universal testing machine UTM-25

A robust 2-column loading frame with an air-cooled hydraulic power pack.

Manual or optional motor driven crosshead positioning, and hydraulic crosshead clamping (optional).

Servo-Hydraulic Actuator: 25kN static and 20kN dynamic capacity

Stroke: 50 mm

Suitable for testing samples incorporating larger aggregates, and where high load capacity for large/stiff samples is required.

Weight: 270 kg

ACCESSORY:

B049-21

ENVIRONMENTAL CHAMBER, stainless steel construction with glass door.

Temperature range: -15 to +60°C. 220-240V 1ph 50/60Hz



B049-20 + B049-21



B053

B053

"Vialit" - binder adhesion test

STANDARDS: EN 12272:3 - NF P98-274-1

Used to evaluate the global adhesion and the active adhesion between bitumen and aggregates for road surfaces realization.

The equipment is formed by:

Six steel test plates

Steel ball weighing 512 g

Metallic base with three vertical support points and metallic rod 500 mm high

Metallic hand operated roller; rubber lined with lead shots ballast.

Weight: 40 kg approx.



B054

Ductilometer

STANDARDS: ASTM D113
AASHTO T51 - N° 66-006
NLT 126 - UNE 7093 - CNR N° 44

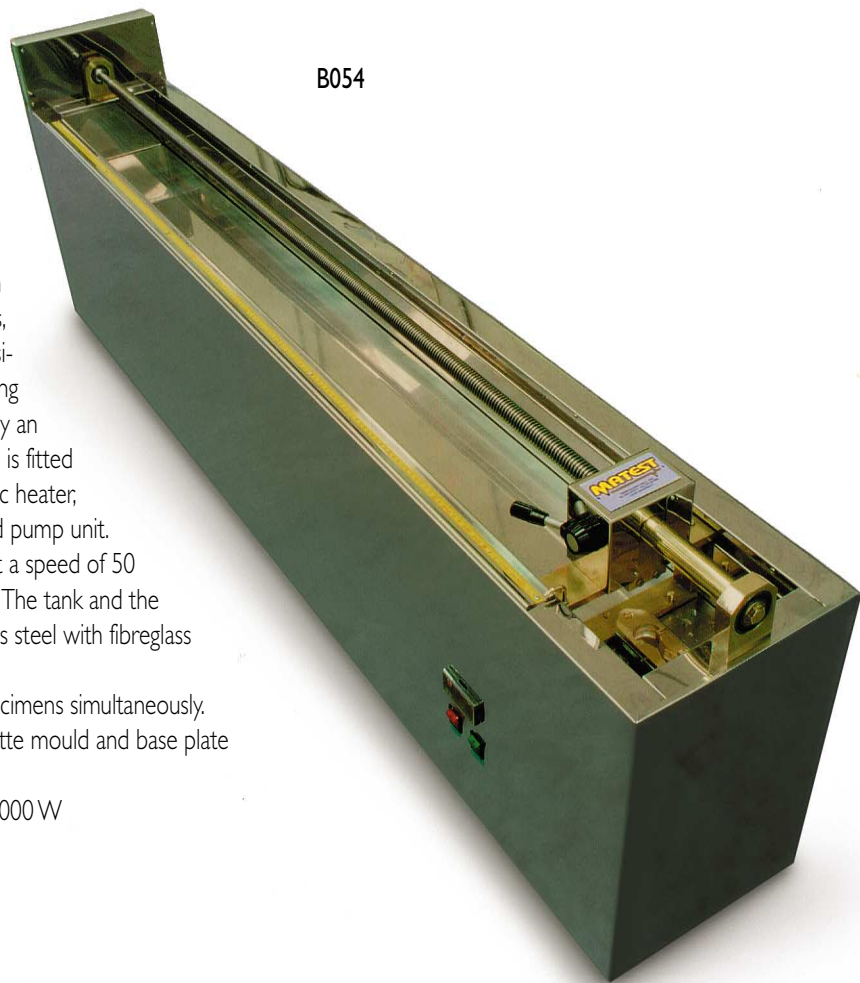
Used to determine the bituminous ductility, that is to say, the distance to which a briquette of molten bitumen can be extended under controlled conditions, before its breaking. The Ductilometer basically consists of a moving carriage travelling along guide ways. The carriage is driven by an electrical motor, inside a large tank which is fitted with digital thermostat, immersion electric heater, cooling coil for cold water circulation and pump unit. This model works in an automatic way at a speed of 50 mm/min. and its max. stroke is 1500 mm. The tank and the external frame are all made from stainless steel with fibreglass insulation.

The ductilometer can accept up to 3 specimens simultaneously. Supplied complete except for the briquette mould and base plate that must be ordered separately.

Power supply: 220-240 V 1 ph 50 Hz 1000 W

Dimensions: 2140x350x400 mm

Weight: 95 Kg



B054

B055

Ductilometer

Same as for mod. B054 but equipped with incorporated refrigerating unit for tests with water temperature at +5°C.

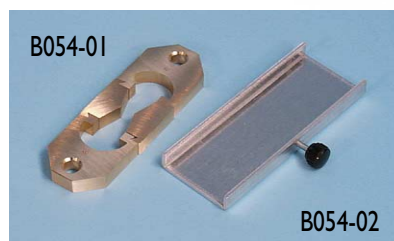
Dimensions: 2140x350x750 mm

Weight: 130 Kg

ACCESSORIES:

B054-01

BRIQUETTE MOULD to prepare the specimen. Supplied without base plate. Weight: 500 g



B054-01

B054-02

B054-02

BASE PLATE for briquette mould.

B059

Automatic digital penetrometer

STANDARDS: EN 1426 - ASTM D5 - BS 2000 - N° 66-004
AASHTO T49 - UNI 4162 - UNE 7013 - NLT 124 - CNR N° 24

Digital measure of the penetration values

Measuring range: 50 mm, sens. 0,01 mm

Motorized approach of the needle, driven by camera (needle diameter = 5 mm on the monitor)

Electric control of the approach

Electromechanical release and locking device of the needle

Motorized return of the needle

Supplied complete with needle, weights, sample cups

Power supply: 220-240V 1 ph 50 Hz

Dimensions: 250 x 230 x 520 mm

Weight : 11 Kg

B059





B056

Standard penetrometer

STANDARDS: EN 1426 - ASTM D5 - BS 2000 - NFT 66-004
AASHTO T49 - UNI 4162 - UNE 7013 - NLT 124
CNR N° 24

Used to determine the consistency of a bituminous sample under fixed conditions of load, time and temperature. The penetration is expressed in distance of tenths of millimeters vertically penetrated by a standard needle. The standard penetrometer is ruggedly constructed, with a base table in light alloy with levelling screws, plated vertical rod, micrometric vertical adjustment device.

The slider is brass made with free fall.

The dial, graduated in 360° (division 0,1 mm.), has diameter of 150 mm.

The penetrometer is supplied with stop and release push button, automatic zero set, micrometer adjustment, set of weights 50 and 100 g, penetration needle, two sample cups dia. 55x35 mm and 70x45 mm.

Dimensions: 220x170x410 mm.

Weight: 11 Kg

ACCESSORIES:

B057-02

MIRROR, for an easier setting of the needle.

B057-03

TRANSFER DISH, made from glass, with support.

B057-06

PENETRATION NEEDLE HARDENED STEEL, supplied with NAMAS Verification Certificate. Weight: $2,5 \pm 0,05$ g

SPARES:

B057-01

PENETRATION NEEDLE. Weight: $2,5 \pm 0,05$ g

B057-04

50 g weight.

B057-05

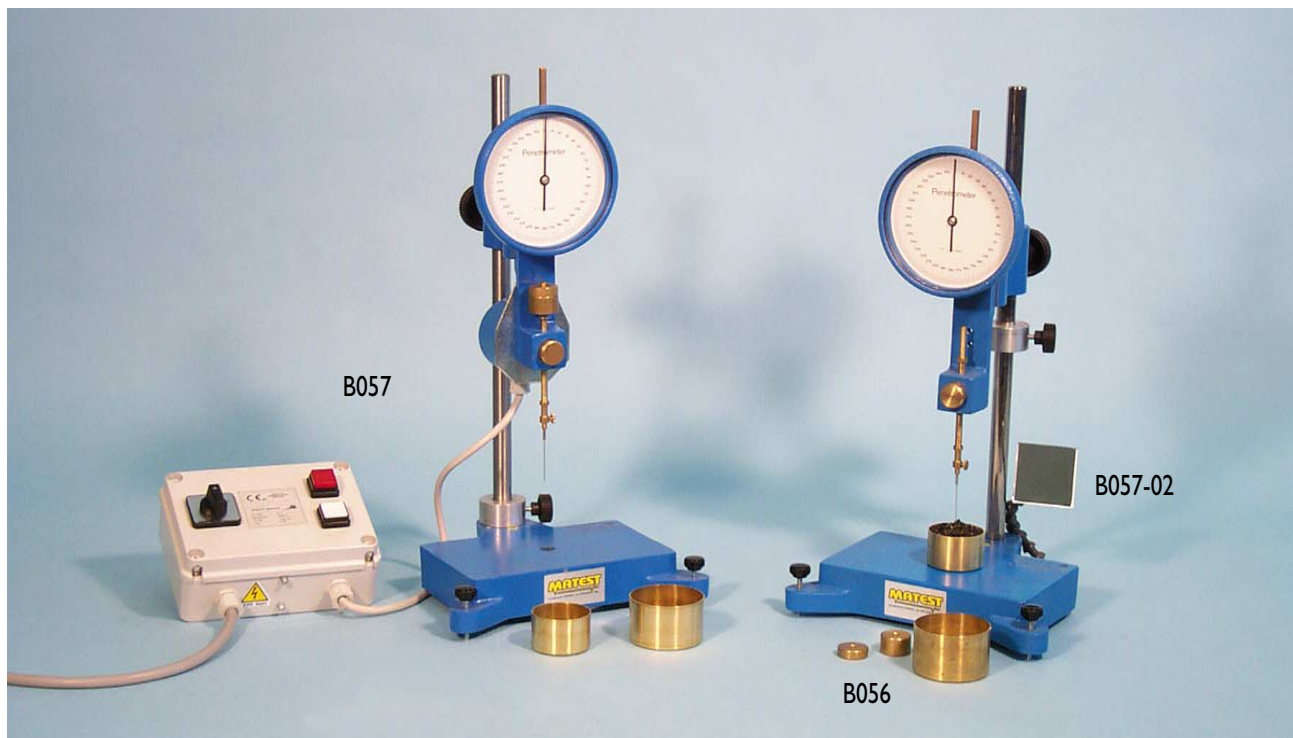
100 g weight.

V122-05

SAMPLE CUP, brass made, dia. 55x35 mm

V122-06

SAMPLE CUP, brass made, dia. 70x45 mm



B057

Automatic penetrometer

Basically structured as mod. B056 but having a magnetic controller device that automatically releases the plunger head and ensures free falling of the needle during the 5-seconds test. The timer is fixed on 5 seconds.

Power supply: 220-240V 1 ph 50 Hz 200 W

Dimensions: 220x280x410 mm

Weight: 15 Kg

B057-03



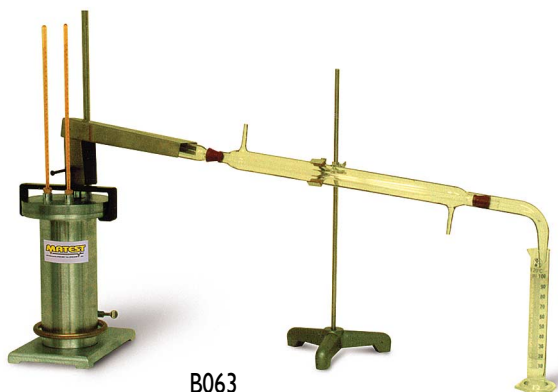


B058 **Thermostatically controlled water bath for penetrometer**

Provides water at the required temperature of $25 \pm 0,1^{\circ}\text{C}$.
The unit consists of a stainless steel water bath 10 litres capacity with wool insulation, immersion heater with digital thermostat, motor pump with connections.
The bituminous sample is immersed into the water bath, and placed on the penetrometer only at the time of the test, by eventually using the transfer dish (accessory mod. B057-03).
Power supply: 220-240 V 1 ph 50 Hz 1050 W
Dimensions: 375x335x420 mm
Weight: 12 Kg

B063 **Emulsified asphalt distillation apparatus**

STANDARDS: ASTM D 244 - AASHTO T 59 - CNR N° 100
The set is formed by: aluminium still container; glass connectors including condenser; stands, graduated cylinder; two thermometers ASTM 7C range -2 to $+300^{\circ}\text{C}$, bunsen burner with gas stop valve controlled by a flame sensor to CE safety Directive.
Weight: 12 Kg



ACCESSORIES:

B058-01
WATER BATH DISH with incorporated thermostatic coil, to be connected to the bath mod. B058. It keeps the temperature of the bitumen sample directly on the penetrometer, by avoiding to transfer it.

B058-02
COOLING COIL DEVICE, current water operated, it maintains a constant temperature of the bath B058 when room temperature is slightly higher.



B060 **Bacon sampler**

STANDARDS: CNR N° 81, N° 98
ASTM D140 - AASHTO T40
Used to obtain asphalt or oil samples from various levels within a storage tank by the "thief" method.
Made from brass.
Capacity 237 ml
Dimensions: dia. 50x250 mm
Weight: 2 Kg





B062

Residue of specified penetration

STANDARD: ASTM D 243

To determine the residue percentage at a known penetration of five seconds at 100 g and 25°C. The set is formed by: bath, container, stand, plate, wire gauze and thermometer ASTM 11C range -6 to +400 °C bunsen burner with gas stop valve controlled by a flame sensor to CE safety Directive.

Weight: 5 Kg



B062

B064

Asphalt oven with rotating shelf

STANDARDS: CNR N° 50 - ASTM D6, D1754 - NFT66-011
AASHTO T47, T179 - BS 2000 - UNE 7110

Internal chamber and external frame all made from stainless steel, double wall insulation with fiberglass, double door. Temperature control by digital thermoregulator. The plate rotates at 5-6 rpm. Supplied complete with glass control thermometer ASTM 13C, +155 to +170°C subd 0.5°C.

The oven is supplied without rotating shelf and accessories, that must be ordered separately.

Power supply: 220-240V 1 ph 50 Hz 1200W

Internal dimensions: 330x330x330 mm

Outside dimensions: 460x450x700 mm

Weight: 40 Kg

The Oven can be equipped in two versions, with the following accessories:

B064-01

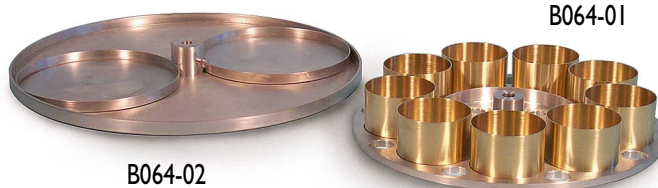
Rotating shelf complete with 9 containers dia. 55x35 mm for the "Determination of Loss on Heating" to ASTM D 6 - BS 2000 NFT066-011 - AASHTO T47 Standards.

B064-02

Rotating shelf, complete with 2 containers dia. 140x9,5 mm for the "Determination of Thin Film" to ASTM D1754 - AASHTO T179 - UNE 7110 - CNR N° 50 Standards.



B064 + B064-01



B064-02

B064-01

SPARES:

B064-03 Thermometer ASTM 13C, +155 to +170°C subd. 0,5°C

V122-05 Brass container dia. 55x35 mm

B064-04 Stainless steel container dia. 140x9,5 mm

B066

Rolling Thin-Film Oven

Effect of heat and air on a moving film of asphalt
STANDARDS: ASTM D2872 - AASHTO T240
CNR N° 54

Utilized to measure the air and heat effect on a moving film of asphaltic semisolid materials. External frame and internal chamber are stainless steel made with insulated fiberglass intermediate chamber.

Provided of large glass door for inspections.

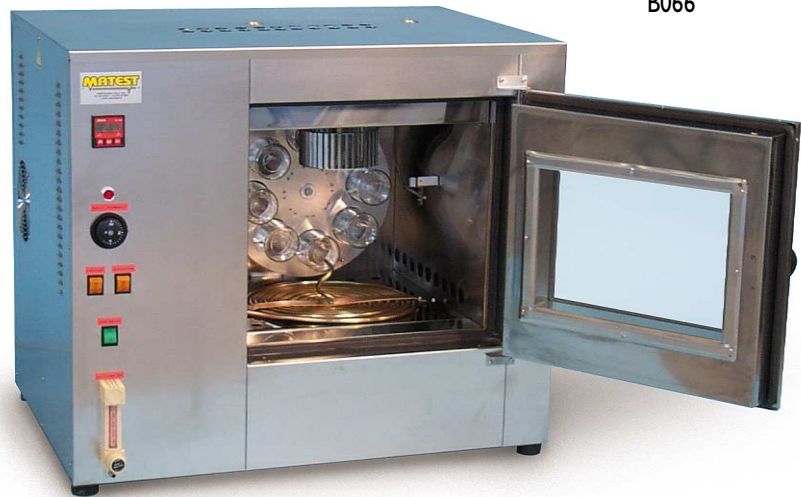
The oven must be connected to a suitable air pressure supply.

Supplied complete with precision digital thermostat to maintain 163°C temperature, control thermometer ASTM 13C, ventilation device, set of eight glass containers dia. 64x140 mm.

Power supply: 220-240 V 1 ph 50 Hz 1300 W

Dimensions: 620x620x910 mm

Weight: 55 Kg



B066

B066-01

Rolling Thin-Film Oven

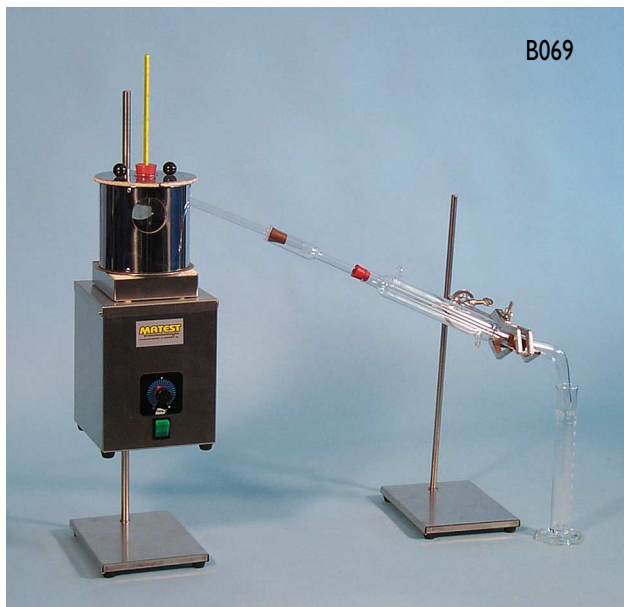
STANDARD: EN 12607-I

Same as for mod. B066 but with modified test chamber to meet EN 12607-I Specifications. Supplied complete.

SPARE:

B066-02

Glass container dia. 64x140 mm



B069

B069

Distillation of cut-back asphalts

STANDARDS: ASTM D402 - AASHTO T78 - NFT 66-003 - CNR
UNE 7112, 7072

Used to measure the amount of the most volatile constituents in cut-back asphaltic products. The apparatus consists of distillation flask, condenser tube, adapter, shield, receiver, supports, electric heater with thermoregulator, graduated cylinder, thermometer ASTM 8C -2 to +400°C subd. 1°C.

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

Weight: 12 Kg

B071

Automatic Ring and Ball apparatus

STANDARDS: ASTM D36 - AASHTO T53 - NFT66-008

UNI 4161 - DIN 52011 - BS 2000 - CNR N° 35

Used to determine the softening point of bituminous materials. The adjustment of the increase of the temperature and the complete test procedure performed by a microprocessor in a fully automatic way.

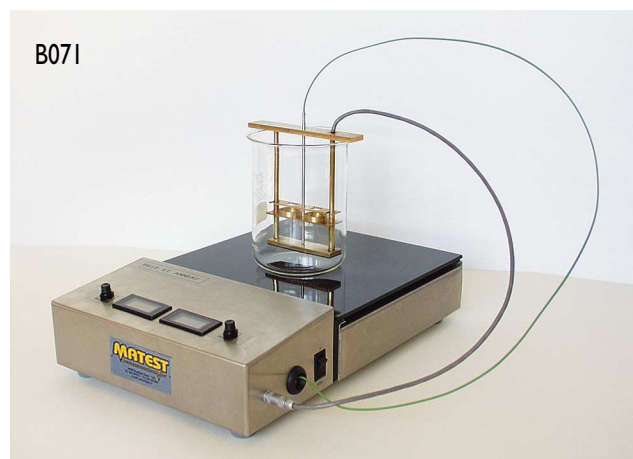
Digital reading of the values on two channels.

Complete with pyrex beaker; rings, balls, accessories.

Power supply: 220-240 V 1 ph 50 Hz 1000 W

Dimensions: 340x220x230 mm

Weight: 15 Kg



B071

section B



59

MATEST

B072

Ring and Ball apparatus for softening point

STANDARDS: ASTM D36 - AASHTO T53 - NFTA 66 008 - BS 2000

UNI 4161 - DIN 52011 - UNE 7111 - CNR N° 35

The softness of bitumen depends, amongst other factors, on the temperature of the substance, where, as the temperature is raised, the softness of the bitumen increases. This simple apparatus has been developed to determine these characteristics. It consists of a pyrex breaker, brass frame, two tapered rings, two ball centering guides and two balls. Weight 900 gr

ACCESSORIES:

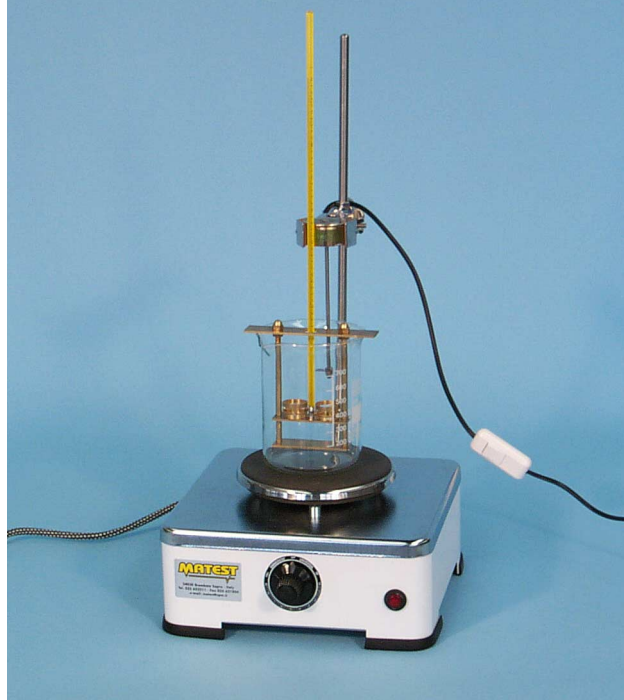
B072-01 THERMOMETER ASTM 15 C -2 to +80°C subd. 0,2°C

B072-02 THERMOMETER ASTM 16 C +30 to +200°C subd. 0,5°C



B072

B072 + B072-01 + B074 + B074-01



SPARES for mod. B071 and B072:

B072-03 Steel ball dia. 9,5 mm

B072-04 Brass tapered ring

B072-05 Ball centering guide

B072-06 Pyrex beaker

B074

Hot plate, complete with thermoregulator for temperature adjustment.

Power supply: 220-240 V 1 ph 50/60 Hz 1000 W

Weight: 6 Kg

B074-01

Electric stirrer, accessory to the hot plate B074 to ensure a more uniform temperature to the bath.

Power supply: 220-240 V 1 ph 50 Hz 100 W

Weight: 1 Kg

B073

Electric heater, complete with thermoregulator for temperature adjustment.

Alternative version to mod. B074.

Power supply: 220-240 V 1 ph 50/60 Hz 1000 W

Weight: 3 Kg

B073-01

Electric heater with magnetic stirrer

Complete with thermoregulator for temperature adjustment and magnetic stirrer with electronic adjustment from 100 to 1200 rpm. Alternative version to mod. B074 + B074-01

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

Weight: 3 Kg



B073-01 + B072 + B072-01

B073 + B072 + B072-01

B076

Water in bituminous materials (Dean - Stark)

STANDARDS: ASTM D95, D244 - IP 74/77
AASHTO T55, T59 - NLT 123
NFT66-113, T66-023
CNR N°101

Used to determine the water in petroleum products or bituminous materials by distilling them with volatile solvent. The equipment comprises electric heater with thermoregulator, glass still, support stand, condenser, receiving trap, clamps.
Power supply:
220-240 V 1 ph 50/60 Hz 500 W
Weight: 8 Kg

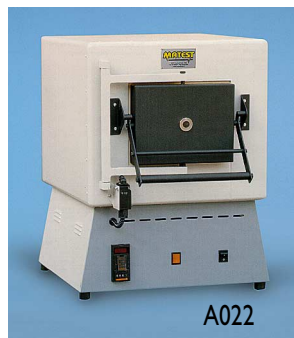


B076

ASH CONTENT

STANDARDS: EN 7
ASTM D482
BS 4450

Muffle furnace to determine the percentage of mineral in petroleum and cut-back bitumen
See section "Aggregates, pag. 9"



A022

B077

Fraas apparatus

STANDARDS: IP 80 - NFT66-026 - DIN 51012 - CNR N° 43



B077

This apparatus is used to determine the breaking point of semisolid and solid bitumes. It consists of a flexure device with two concentric sliding resin tubes, jaws for the test specimen, flexure system with handle, cooling device with three containers, plate in special harmonic steel, thermometer IP 42C.
Weight: 4 Kg

SPARES:

- B077-01** Plate (spring) in special harmonic steel
- B077-02** Thermometer IP 42C

B079

Cabinet with aspirator

Utilized to exhaust vapours and toxic gas caused by Centrifuge Extractors, Hot Extractors, Concrete capping, etc. by avoiding they are diffused in the laboratory. Wooden plastified made, with gres ceramic table, complete with switches, electric and water installation, windows, shelves. The front door, made with transparent material can be lifted for an easy access to the operation desk. Complete with electric aspirator and electric lighting.
Power supply: 220-240 V 1 ph 50 Hz 350 W
Dimensions: 1250x750x2600 mm
Weight: 180 Kg



B079

THERMOMETERS FOR ASPHALT TEMPERATURE MEASUREMENT
See section "V", pag. 262





B080 **Engler viscometer**

STANDARDS: ASTM D 940, D 1665 - AASHTO T54 - BS 2000
NFT66-020 - CNR N° 102

Used to compare the specific viscosity of road-oils and tars to the viscosity of water.

It consists of a water bath complete with digital precision thermoregulator; electric stirrer; cooling device, Engler flask.

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

Dimensions: 265x270x550 mm

Weight: 12 Kg

B081 **Engler viscometer**

Basically structured as mod. B080 but having "Two elements", electrically operated, supplied complete. Weight: 20 Kg

ACCESSORIES:

B082-01 THERMOMETER ASTM 23 C range +18 +28°C
subd. 0,2°C

B082-02 THERMOMETER ASTM 24 C range +39 +54°C
subd. 0,2°C

B082-03 THERMOMETER ASTM 25 C range +95 +105°C
subd. 0,2°C

B082-04 THERMOMETER NFT66 -020 range 0-55°C. subd. 0,2°C

SPARE:

B082-05 Engler testing flask

B083

Standard Redwood-TAR-BRTA viscometer

STANDARDS: NFT66-005 - BS 2000 - I.P. 72/86

Used to determine the viscosity of cut-back bitumen and road oil. Consisting of a brass cup, stainless steel bath, stirrer; electric heater with digital thermoregulator; cooling coil.

Complete with a 10 mm dia. cup, ball valve, go/not gauge, flask, thermometer IP 8C range 0-45°C subd. 0,2°C, graduated glass cylinder:

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

Dimensions: 265x270x550 mm.

Weight: 12 Kg

B084

Standard Redwood-TAR-BRTA viscometer

Basically structured as mod B083 but having "TWO ELEMENTS". Supplied complete.

ACCESSORIES:

B083-01 Go/Not Go gauge for 4 mm orifice - NF - IP Spec.

B083-02 Cup dia. 4 mm with orifice - NF - IP Spec.

B083-03 Ball valve dia. 4 m. NF - IP Spec.

SPARES:

B083-04 Go/Not Go gauge for 10 mm orifice - BS - NF - IP Spec.

B083-05 Cup dia. 10 mm with orifice BS - NF - IP Spec.

B083-06 Ball Valve dia. 10 mm BS- NF - IP Spec.

B083-07 Thermometer IP8C range 0-45°C subd. 0,2°C





B085

Cleveland flash and fire point tester

OPEN CUP ELECTRIC HEATING

STANDARDS: BS 4689 - ASTM D92 - AASHTO T48 - UNI 4160
IP 36/67 - UNE 7075 - EN 22592 - NFT60-118
CNR N° 72

Used to measure the flash and fire points of lubricated oils and petroleum products.

It is supplied complete with brass cup, thermometer IP 28C (ASTM 11C) range -6 +400°C, electric heater with thermoregulator.
Power supply: 220-240V 1 ph 50/60 Hz 600W
Weight: 10 Kg

SPARE:

B085-02 Thermometer IP 28C (ASTM 11C), range -6 +400°C

B087

Saybolt viscometer

STANDARDS: ASTM D88 - D244 - AASHTO T72
UNE 7066, 51021

Used to determine the viscosity of petroleum products at specified temperatures between 70 to 210 °F. Stainless steel made, the Saybolt viscometer is supplied complete with two interchangeable orifices "Furol" and "Universal", oil bath, electric heater with digital thermoregulator, stirrer, cooling coil, viscosity flask. Thermometers are not included and must be ordered separately.

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

Dimensions: 270x270x550 mm

Weight: 12 Kg

B087-01

Two tube Saybolt viscometer

Basically structured as mod. B087 but with two tubes. Supplied complete except thermometers.

B088

Three tube Saybolt viscometer

Basically structured as mod. B087 but with three tubes. Supplied complete except thermometers.

SAYBOLT THERMOMETERS:

		Range	Subd.
B089	ASTM 17C	+19 +27°C	0,1°C
B089-01	ASTM 18C	+34 +42°C	0,1°C
B089-02	ASTM 19C	+49 +57°C	0,1°C
B089-03	ASTM 20C	+57 +65°C	0,1°C
B089-04	ASTM 21C	+79 +87°C	0,1°C
B089-05	ASTM 22C	+95 +103°C	0,1°C

SPARES:

B089-06 FUROL orifice

B089-07 UNIVERSAL orifice

B089-08 SAYBOLT flask 60 ml capacity





B092

Tag closed viscometer

STANDARDS: ASTM D56 - API 509

Suitable for testing volatile flammable flashing between 0 and 175°F (except fuel oils). Supplied complete with cup, water bath, lid, slide, thermoregulated heating device, thermometer ASTM 9C range -5 to +110°C and thermometer ASTM 57 C range -20 to +50°C.

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

Weight: 8 Kg



B092

B093

Tag open-cup viscometer

STANDARDS: ASTM D1310, D 3143

For the determination of open cup flash points of volatile flammable materials having flash points between 0 and 175 °F

Supplied complete with cup, water bath, thermoregulated heating device, thermometers ASTM 9C -5 to +110°C and ASTM 57C -20 to +50°C.

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

Weight: 8 Kg



B093

Hubbard-Carmick specific gravity bottles

STANDARDS: ASTM D70
BS 4699 - AASHTO T228

VIII Cylindrical type,
24 ml

VIII-01 Conical type, 25 ml



VIII-01

VIII

B094

Pensky-Martens flash point tester

STANDARDS: ASTM D93 - AASHTO T73

Used for the determination of the flash point of petroleum products by the Closed Cup Test, with a Flash Point higher than 50°C. Supplied complete with stirrer; shield for radiations, cast iron bath, electric heater with thermoregulator two thermometers ASTM 9C -5 + 110°C div. 0,5 C, and ASTM 10C +90 +370°C div. 2°C.

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

Weight: 8 Kg



B094

Duriez test set

STANDARDS: NF P98 - 251-1/4

Used to determine the mechanical and physical properties of bituminous mixtures.

Duriez test set for 120 mm dia. specimens:

- B095-01** Testing mould
- B095-02** Penetration piston
- B095-03** Penetration piston grooved
- B095-04** Upper/Lower piston
- B095-05** Upper/Lower piston grooved
- B095-06** Two temporary supports
- B095-07** Demoulding cylindrical container



B095-01 ÷ B095-07

Duriez test set for 80 mm dia. specimens:

- B096-01** Testing mould
- B096-02** Penetration piston
- B096-03** Penetration piston grooved
- B096-04** Upper/Lower piston
- B096-05** Upper/Lower piston grooved
- B096-06** Two temporary supports
- B096-07** Demoulding cylindrical container



B097

B097

P.R.D. mould

STANDARDS: BS 598:104 - EN 12697-32

This mould, vertically split on one side, foreseen of clamp attachment to the base plate, plated against corrosion, is utilized for determining the degree of compaction of bituminous pavements, for quality control purpose.

Weight: 12 Kg

ACCESSORIES:

- B097-01** Small tamping foot, dia. 102 mm
- B097-02** Large tamping foot dia. 146 mm
- B097-03** Shank 300 mm long for tamping foot
- S197** Vibrating Hamer (see sector Soil)

B099

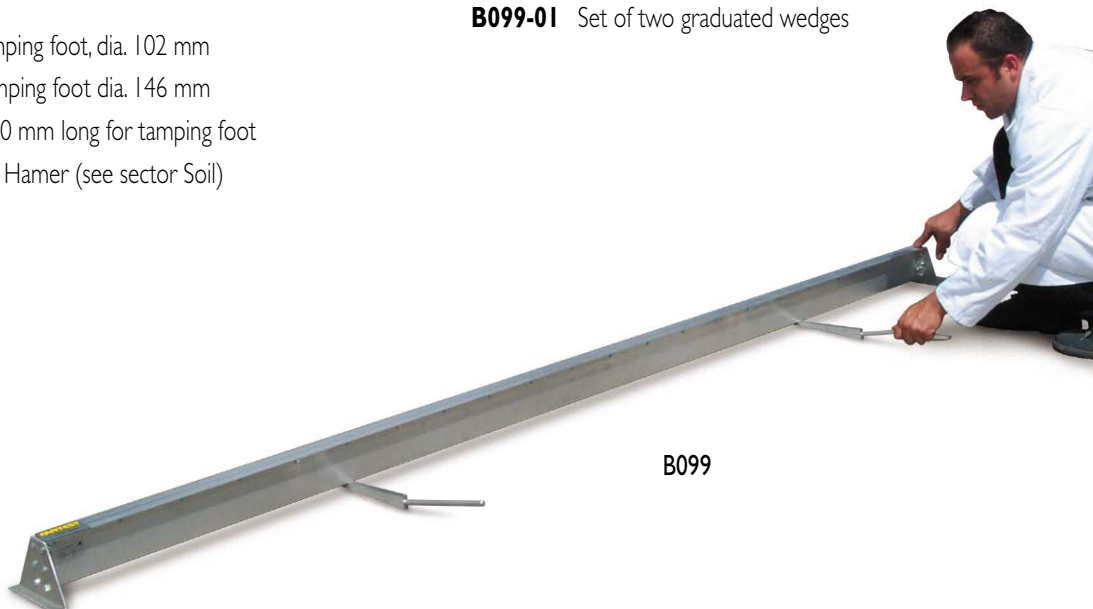
MOT straight edge

Manufactured from aluminium alloy, it is utilized to measure irregularities on road pavement, floors, concrete pavement. Length is 3 metres, and it is supplied complete with two graduated measuring wedges.

Weight: 10 Kg

SPARE:

- B099-01** Set of two graduated wedges



B099



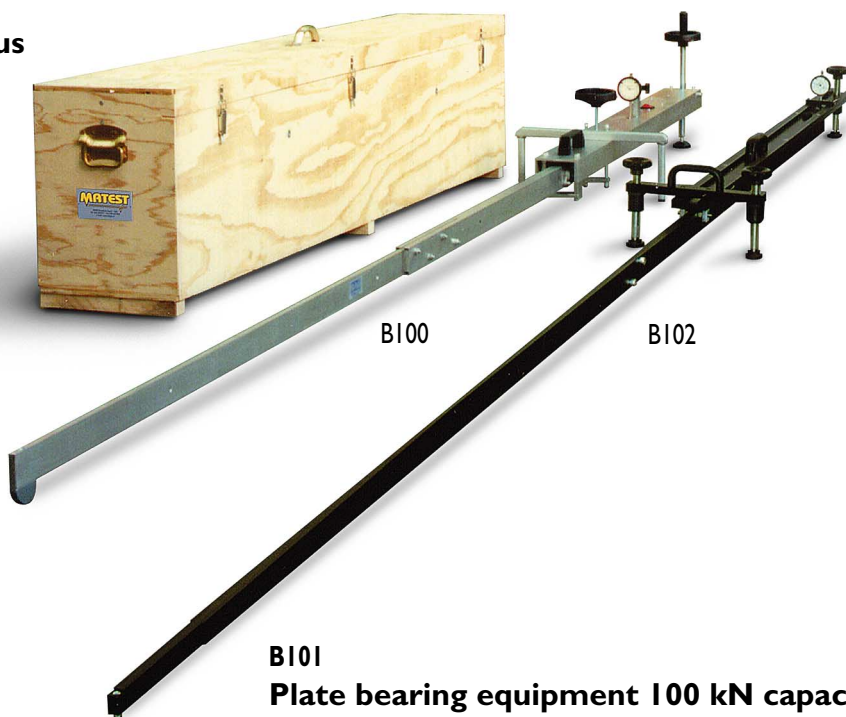


B100

Benkelman beam apparatus

STANDARDS: CNR N° 141
AASHTO T256-77

Alluminium alloy made, complete with dial indicator and accessories, it is utilized to measure the deflection of the road surface when loaded by the wheels of vehicles. The beam is put in contact with the pavement under test between the tires of the vehicle. The measurement of the deflection is performed when the vehicle passes over the test area. Length of the Benkelman beam is 250 cm. Beam fulcrum ratio 4:1
Supplied complete with wooden carrying case. Weight: 15 Kg



B101

Plate bearing equipment 100 kN capacity

STANDARD: NF P94-117

Utilized with the Benkelman Beam B100 or B102, to measure the static deflection in the centre of the plate from an independent point of the local load deflections: EV1/EV2 (roads) and Westergard (platforms)

The equipment consists of:

- Bearing plate dia. 300 mm with central measuring device
- 100 kN capacity hydraulic ram complete with hand pump
- Manometer range 0-100 kN
- Extension rods, spherical bearing, couplings, hoses, accessories
- Portable wooden carrying case
- Weight: 72 Kg

B103

Plate bearing equipment 200 kN

Same as per mod. B101 but having capacity of 200 kN

ACCESSORY:

S226-02

Bearing plate dia. 600 mm

B102

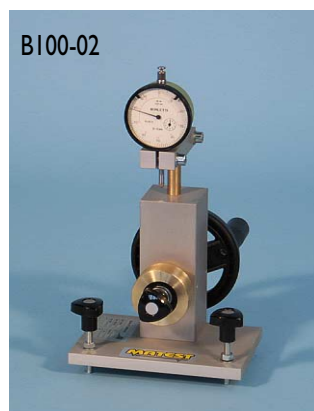
Benkelman beam apparatus

STANDARD: NF P98-200/2

Basically similar to mod. B100 but manufactured according to the French Specifications.

Beam fulcrum ratio 2:1

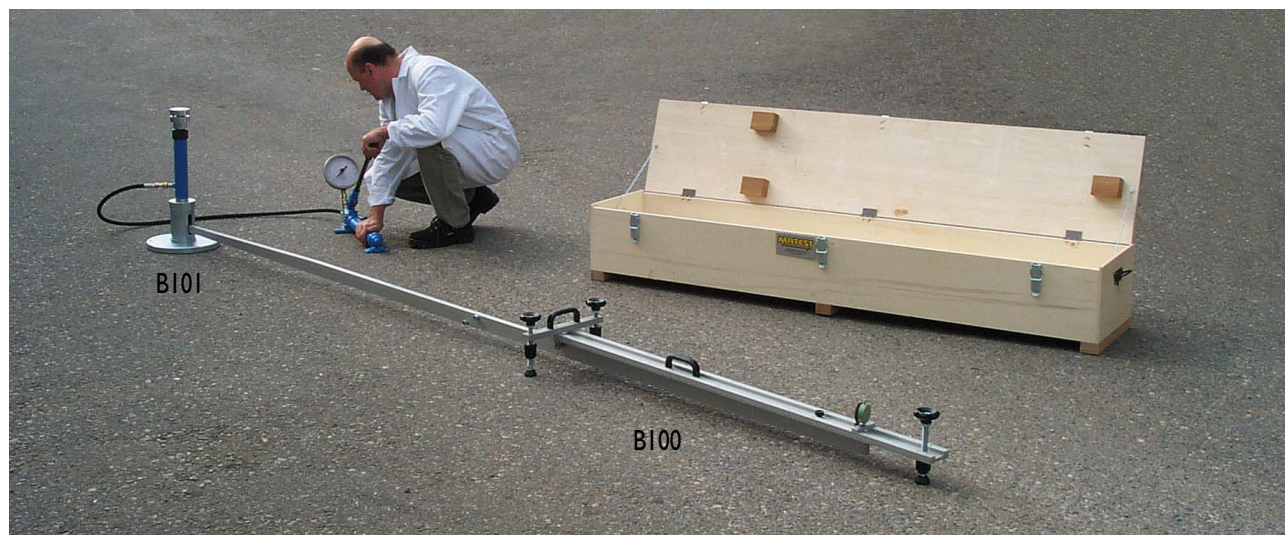
Supplied complete with wooden carrying case. Weight: 15 Kg



ACCESSORY:

B100-02

Benkelman indicator gauge calibration unit, complete for mod. B100 and B102.





B110

B110

Pavement density meter “non nuclear”

This technically advanced “non-nuclear” instrument is designed for road contractors, highway agencies, laboratory technicians and local authorities to measure asphalt densities “during” and after laying. Achieving consistent compaction across asphalt material longitudinally and transversely during lay-down is the most important variable in constructing a quality hot mix asphalt pavement.

With this meter you can now:

- establish more effective rolling patterns
- ensure pavement densities are within your target range
- more quickly identify “tender zones” to change your compaction process
- quickly profile your densities in critical areas, including wheel paths, longitudinal joints, and unconfined edges
- evaluate pavement sections to be cored

The unit is particularly effective on critical projects such as super-pave, airports, warranties and design/builds where compaction processes are more difficult and tolerances are tighter.

The instrument is easy to use, does not require expensive specialized training and it is “non nuclear”.

Sampling time: 5 seconds

Measuring depth: 20 to 150 mm

Operating temperature and humidity: -7 °C to 43 °C - RH 95%

Maximum surface temperature: 177 °C

Continuous operational time: 13 hours

Power supply: rechargeable batteries

Dimensions: 270x270x280 mm

Weight: 7,5 Kg



A110

SURFACE FRICTION

Skid resistance tester

See section “Aggregates” pag. 28

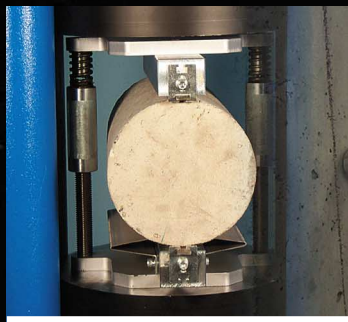


Section C

CONCRETE

The accurate and satisfactory test of fresh and hardened concrete are essential elements for any type of building realization. The final quality of the concrete utilized in the structure depends from many variables like: workability, consistency, setting, time, volumic mass, air content, compressive strength, temperature, linear variations, corrosion etc.

Matest proposes a complete range of testing and research equipment on concrete to satisfy practically all the above quality variables, in compliance with the EN, ASTM and the most known International Standards.



Index section

CONCRETE

	Mod.	Page		Mod.	Page
Accelerated curing.....	C307.....	121	Impermeability tester.....	C435.....	140
Air entrainment meter.....	C195.....	111	Joisel apparatus.....	C211.....	112
Anvil for test hammers.....	C390.....	133	Kelly ball.....	C186.....	109
Automatic servocontrolled system.....	C124.....	95	K-Slump tester.....	C187.....	109
Beam moulds.....	C254.....	115	Measures, unit weight.....	C199/C205.....	112
Bits, diamond for drilling machines.....	C340-05.....	127	Metal detectors.....	C396/C401.....	134
Calibration equipment.....	C139/C155.....	104/106	Micro-Covermeter.....	C401.....	134
Canin, corrosion instrument.....	C411.....	137	Microscope, crack detection.....	C399.....	137
Capping equipment, sulphur method.....	C290.....	118	Mixers, laboratory.....	C160/C165.....	107
Climatic chamber freeze/thaw tests.....	C314.....	123	Mobile laboratories.....	-----	141
Compacting factor apparatus.....	C185.....	109	Moulds for concrete specimens.....	C228/C258.....	114/115
Compression testing machines.....	C011/C089.....	70/90	Needle Vibrators, poker.....	C271.....	116
Compression machines. Accessories.....	C097/C123.....	96/101	Oil, demoulding moulds.....	C265.....	115
Compression machines, high stability.....	C089.....	80/90	Penetrometers.....	C194/C213.....	110
Compression machine 55kN portable.....	C094.....	102	Permeability apparatus.....	C430/C431.....	139/140
Compressometer, elasticity modulus.....	C130.....	103	Plasticity meter.....	C190.....	110
Concrete test hammers.....	C380.....	131	Porosimeters.....	C195.....	111
Concrete workability meter.....	C189.....	110	Prism moulds.....	C254.....	115
Consistometer, Vébé.....	C183.....	108	Profometer, metal detector.....	C396.....	134
Core drilling machines.....	C318/C324.....	124/127	Pull-out tester.....	C376.....	129
Corrosion instruments.....	C411/C415.....	137/138	Ram, rapid analysis machine.....	C215.....	113
Cover to reinforcement.....	C396/C401.....	134	Resistivity meter.....	C413.....	138
Crack detection microscope.....	C399.....	137	Schmidt test hammers.....	C382.....	131
Crack width gauge.....	C408.....	136	Servo-Unit power system.....	C099.....	91
Cube moulds.....	C228/C256.....	114/115	Shrinkage of concrete.....	C366.....	130
Curing room vaporisers.....	C311.....	122	Simrup apparatus.....	C135.....	103
Curing tanks.....	C305/C308.....	120/121	Slump cone.....	C180.....	108
Cutting machines.....	C348/C351.....	128	Slump flow table.....	C192.....	109
Cylinder moulds.....	C228/C258.....	114/115	Splitting tensile test devices.....	C100.....	97
Deflectometers.....	C402/C407.....	135/136	Strain gauges.....	C360.....	129
Demoulding oil.....	C265.....	115	Table, flow test.....	C208.....	113
Density of hardened concrete.....	V084.....	111	Table vibrators.....	C278.....	117
Diamond bits for drilling machines.....	C340-05.....	127	Tanks, curing tests.....	C305/C308.....	120/121
Diamond blade for cutting machines.....	C350-12.....	128	Thermometer, recording.....	C303/C310.....	122/123
Digital display unit for testing machines.....	C099.....	91	Ultrasonic testers.....	C368/C370.....	132
Drilling machines.....	C318/C324.....	124/127	Unit weight measures.....	C199/C205.....	112
Flexural device for compression frames.....	C106.....	98	Vaporisers, curing rooms.....	C311/C313.....	122
Flexural testing machines.....	C090/C093.....	85/88	Vébé consistometer.....	C183.....	108
Flow tables.....	C208.....	113	Vibrating needles and tables.....	C271/C280.....	116/117
Footometer stability verification tester.....	C155.....	106	Walz apparatus.....	C188.....	109
Generator, electric, portable.....	C332.....	127	Water permeability testers.....	C430/C435.....	139/140
Grinding machine.....	C300.....	119	Water test set for concrete.....	C220.....	112
Half cell corrosion meter.....	C411/C415.....	137/138	Windsor probe.....	C410.....	137
Hammers, test of concrete.....	C380.....	131	Workability meter.....	C189.....	110
Hydraulic shrinkage determination.....	C365.....	130			
Hygrometer for moisture tests.....	C375.....	130			
Impact failure on tiles.....	C096.....	103			



COMPRESSION TESTING MACHINES

Two basic desing are available:

- MACHINES WITH FOUR COLUMNS PRESTRESSED FRAME
STANDARDS: UNI 6686, 1, 2 - ASTM C39 - BS 1610
NF P18-411
- MACHINES WITH FOUR COLUMNS HIGH STABILITY AND
STIFFNESS FRAME
STANDARDS: EN 12390 - BS 1881 - DIN 51220 - UNI 6686/3

section C



70



GENERAL DESCRIPTION

The load frame is extremely strong and oversized to grant high rigidity and stability.

The upper head holds the precision lapped ball-seating and the compression platen.

Compression platens are surface hardened HRC 60 and ground.

Design emphasis has been placed on simplicity both of construction and operation so that our machines are rugged, easy to use and maintain, and designed for heavy continue use.

They are designed to conform to International Specifications as: EN, ASTM, AASHTO, BS, NF, DIN, UNI, UNE.

They are available in 1200 kN, 1500 kN, 2000 kN, 3000 kN, 5000 kN capacity, both hand-operated and motorized, at one or two gauges, with electronic digital display measuring system, and with automatic servocontrolled console with microprocessor.

The different versions give the possibility to test cubes, cylinders, blocks. All the machines can be equipped of safety guards.

Hydraulic system

Piston has large diameter: this allows the hydraulic circuit to work at low pressure with longer life of working components and higher precision in the results.

Piston is ground and lapped, and a packing high quality set of three elements is utilized.

Motorized models foresee a dial device to visualize, pre-select and control the flow allowing an uniform load rate as requested by Standards.

A fast approach ram action device is foreseen to avoid dead times during stroke of the ram.

The manual pump is two stage for fast approach ram action and automatic change for test pressure.

Power pump is multipiston, assuring continuity of delivery.

A movement indicator visualizes instant by instant the piston's excursion during the compression test.

A hopper is foreseen avoiding the powder of the broken specimen to enter into the cylinder of the press damaging the packing set.





LOAD MEASUREMENT SYSTEMS

A) GAUGES

The gauges are Bourdon tube type. They are foreseen of max. load pointer, zero adjustment and mirror face to avoid parallax errors.

Low pressure gauge is fully protected from overload by a pressure control device.



B) DIGITAL DISPLAY UNIT WITH MICROPROCESSOR (mod. C099 - technical data: see pag. 91)

The digit system enables direct readings of the load and automatic processing of the specific strength, with high precision values on all the range.

The load and specific resistance values are automatically retained until cancelled by the operator or transferred to a PC through a RS 232 port for elaboration or storage. It is possible to record on paper these values by printing device.

C) AUTOMATIC SERVO-CONTROLLED SYSTEM

(mod. C098 - technical data: see pag. 91)

Provides a fully automatic testing through all the phases, including control of load, pace rate, printout results and certificates with software menus.



Calibration and precision

All the compression machines are calibrated with high accuracy electronic instruments and they are guaranteed in GRADE "A" (max. error \leq than $\pm 1\%$).

A Calibration Certificate is supplied along with the machine.

TECHNICAL FEATURES OF THE FOUR COLUMNS PRESTRESSED FRAME

STANDARDS: UNI 6686, I 2 - ASTM C39 - BS 1610 - NF P18-411

- Gauges dia. 250 mm are fitted with max. load pointer; zero adjustment, damping system.
- Gauges have mirror face avoiding parallax errors.
- Low pressure gauge is protected from overloads.
- Compression platens are hardened 60 HRC and rectified.
- Device to check piston's excursion during test.
- The columns are prestressed to provide a very high rigidity.
- Piston having 55 mm stroke and cylinder are coupled with high quality packing set.
- The tank is foreseen of oil level and oil discharge.
- Dial speed selector to visualize, pre-select and control the oil flow.
- Power pump is multipiston assuring continuity of delivery.
- Fast approach ram device to avoid dead times.
- Ball seating is accurately machined.

section C



72



"SERVO-UNIT" CONTROL CONSOLE
(mod. C098 - see pag. 91)

- Automatic testing through all phases
- Automatic control of load and pace rate
- User friendly software menus
- Software to print out test results and certificate

DIGITAL DISPLAY
(mod. C099 - see pag. 91)

- Load value in: kN - Lbf - Tons
- Automatic load pacer
- RS 232 port for PC connection
- Safety overload program
- Storage of test results
- Connector to printer

COMPRESSION TESTER 1200 kN CAPACITY

To test cylinders up to dia. 160x320 mm and cubes up to 100 mm side

STANDARDS: ASTM C39, C1231 - AASHTO T22 - NF P18-411 - UNE 83304, 7242

TECHNICAL SPECIFICATIONS:

- Max. vertical daylight: 336 mm
- Compression platens dia. 165 mm
- Gauges dia. 250 mm with specific resistance scales for cylinders dia. 100 - 150 - 160 mm
- Gauges divisions: 1200 kN div. 4 kN - 600 kN div. 2 kN
- Calibration accuracy: Grade 1.0
- Max. ram travel 55 mm approx.
- Power supply (motorized models): 220-240 V 1 ph 50 Hz 750 W
- Dimensions: 600x340x1150 mm
- Weight: 350÷400 Kg

C015 + C120



C013 + C111-02



section C



73

Model	Hand Operated	Motorized	1 Gauge	2 Gauges	Digital display mod. C099 (see pag. 91)	Servo-Unit mod. C098 (see pag. 91)
C011	•		•			
C012	•			•		
C013		•	•			
C014		•		•		
C015		•			•	
C016		•				•



C012 + C119

ACCESSORIES:

- C111-02** Distance piece to test cubes 100 mm side
- C111-03** Distance piece to test cylinders dia. 100x200 and 110x220 mm
- C120** Strip printer for mod. C015 and C016
- C124-02** Printer, A4 format for mod. C015 and C016
- C097** Dual low capacity digital range 0-400 kN for accurate measurements on low strength specimens, for mod. C015 and C016
- C121** Safety guards to 89/392/CEE Directive, polycarbonate made, complete with hinges and lock
- C119** Fragment guard to 89/392/CEE Directive, polycarbonate sheet

Additional accessories for specific tests listed at pag. 96÷101

COMPRESSION TESTER 1500 kN CAPACITY

To test cubes up to 150 mm side and cylinders up to dia. 160x320 mm

STANDARDS: ASTM C39 - AASHTO T22 - UNI 6686, 1, 2 - DIN 51220 - NF P18-411 - BS 1610 - UNE 83304, 7242

TECHNICAL SPECIFICATIONS:

- Max. vertical daylight: 336 mm
- Compression platens dia. 216 mm
- Gauges dia. 250 mm with specific resistance scales for cubes 150 mm and cylinders dia. 150 and 160 mm
- Gauges divisions: 1500 kN div. 5 kN - 600 kN div. 2 kN
- Hydraulic device to stop the piston's stroke at its max excursion
- Calibration accuracy: Grade 1.0
- Max. ram travel 55 mm approx.
- Power supply (motorized models): 220-240 V 1 ph 50 Hz 750 W
- Dimensions: 630x350x1260 mm
- Weight: 540÷580 Kg



C04I + C11I



C036 + C12I



C039 + C11I

ACCESSORIES:

- C11I** Distance piece to test cubes 150 mm side
- C11I-01** Distance piece to test cubes 100 mm side
- C11I-03** Distance piece to test cylinders dia. 100x200 and 110x220 mm
- C120** Strip printer for mod. C040 and C04I
- C124-02** Printer, A4 format for mod. C040 and C04I
- C097** Dual low capacity digital range 0-500 kN for accurate measurements on low strength specimens, for mod. C040 and C04I
- C12I** Safety guards to 89/392/CEE Directive, polycarbonate made, complete with hinges and lock
- C119** Fragment guard to 89/392/CEE Directive, polycarbonate sheet

Additional accessories for specific tests listed at pag. 96÷101

Model	Hand Operated	Motorized	1 Gauge	2 Gauges	Digital display mod. C099 (see pag. 91)	Servo-Unit mod. C098 (see pag. 91)
C036	•		•			
C037	•			•		
C038		•	•			
C039		•		•		
C040		•			•	
C04I		•				•



COMPRESSION TESTER 2000 kN CAPACITY

To test cubes up to 150 mm side and cylinders up to dia. 160x320 mm

STANDARDS: ASTM C39 - AASHTO T22 - UNI 6686, 1, 2 - DIN 51220 - NF P18-411 - BS 1610 - UNE 83304, 7242

Model	Hand Operated	Motorized	1 Gauge	2 Gauges	Digital display mod. C099 (see pag. 91)	Servo-Unit mod. C098 (see pag. 91)
C051	•		•			
C052	•			•		
C053		•	•			
C054		•		•		
C055		•			•	
C056		•				•

TECHNICAL SPECIFICATIONS:

- Max. vertical daylight: 336 mm
- Compression platens dia. 216 mm
- Gauges dia. 250 mm with specific resistance scales for cubes 150 mm and cylinders dia. 150 and 160 mm
- Gauges divisions: 2000 kN div. 5 kN - 600 kN div. 2 kN
- Hydraulic device to stop the piston's stroke at its max excursion
- Calibration accuracy: Grade 1.0
- Max. ram travel 55 mm approx.
- Power supply (motorized models): 220-240V 1 ph 50 Hz 750 W
- Dimensions: 690x400x1320 mm
- Weight: 650÷700 Kg

ACCESSORIES:

- C111** Distance piece to test cubes 150 mm side
- C111-01** Distance piece to test cubes 100 mm side
- C111-03** Distance piece to test cylinders dia. 100x200 and 110x220 mm
- C112** Upper and lower compression platens 245x510 mm to test also blocks and cubes 200 mm side
- C120** Strip printer for mod. C055 and C056
- C124-02** Printer, A4 format for mod. C055 and C056
- C097** Dual low capacity digital range 0-500 kN for accurate measurements on low strength specimens, for mod. C055 and C056
- C121** Safety guards to 89/392/CEE Directive, polycarbonate made, complete with hinges and lock
- C119** Fragment guard to 89/392/CEE Directive, polycarbonate sheet

Additional accessories for specific tests listed at pag. 96÷101



C054 + C111



C055 + C120 + C121



COMPRESSION TESTER "ENBLOC FRAME" 2000 kN CAPACITY

To test cubes up to 150 mm side and cylinders up to dia. 160x320 mm

STANDARDS: UNI 6686, 1, 2 - ASTM C39 - AASHTO T22 - NF P18-411 - DIN 51220 - BS 1610 - UNE 83304, 7242

TECHNICAL SPECIFICATIONS:

- Max. vertical daylight: 336 mm
- Compression platens dia. 216 mm
- Gauges dia. 250 mm with specific resistance scales for cubes 150 mm and cylinders dia. 150 and 160 mm
- Gauges divisions: 2000 kN div. 5 kN - 600 kN div. 2 kN
- Calibration accuracy: Grade 1.0
- Max. ram travel 55 mm approx.
- Power supply (motorized models): 220-240 V 1 ph 50 Hz 750 W
- Dimensions: 680x400x1310 mm
- Weight: 550÷600 Kg

ACCESSORIES:

- C111** Distance piece to test cubes 150 mm side
- C111-01** Distance piece to test cubes 100 mm side
- C111-03** Distance piece to test cylinders dia. 100x200 and 110x220 mm
- C112** Upper and lower compression platens 245x510 mm to test also blocks and cubes 200 mm side
- C120** Strip printer for mod. C064
- C124-02** Printer, A4 format for mod. C064
- C097** Dual low capacity digital range 0-500 kN for accurate measurements on low strength specimens, for mod. C064
- C119-02** Fragment guard to 89/392/CEE Directive, polycarbonate sheet

Additional accessories for specific tests listed at pag. 96÷101

section C



76

Model	Hand Operated	Motorized	1 Gauge	2 Gauges	Digital display mod. C099 (see pag. 91)
C060	•		•		
C061	•			•	
C062		•	•		
C063		•		•	
C064		•			•



C063 + C111



C062 + C119-02

COMPRESSION TESTER 3000 kN CAPACITY

To test cubes up to 200 mm side and cylinders up to dia. 160x320 mm

STANDARDS: ASTM C39 - AASHTO T22 - UNI 6686, 1, 2 - DIN 51220 - NF P18-411 - BS 1610 - UNE 83304, 7242

TECHNICAL SPECIFICATIONS:

- Max. vertical daylight: 336 mm
- Compression platens dia. 287 mm
- Gauges dia. 250 mm with specific resistance scales for cubes 150 mm and cylinders dia. 150 and 160 mm
- Gauges divisions: 3000 kN div. 10 kN - 600 kN div. 2 kN
- Hydraulic device to stop the piston's stroke at its max excursion
- Calibration accuracy: Grade 1.0
- Max. ram travel 55 mm approx.
- Power supply (motorized models): 220-240 V 1 ph 50 Hz 750 W
- Dimensions: 860x470x1450 mm
- Weight: 1050÷1120 Kg



C068



C070 + C120

ACCESSORIES:

- C111-04** Distance piece to test cubes 200 mm side
- C111-05** Distance piece to test cubes 150 mm side
- C111-06** Distance piece to test cubes 100 mm side
- C111-07** Distance piece to test cylinders dia. 100x200 and 110x220 mm
- C112** Upper and lower compression platens 245x510 mm to test also blocks
- C120** Strip printer for mod. C070 and C071
- C124-02** Printer, A4 format for mod. C070 and C071
- C097** Dual low capacity digital range 0-500 kN for accurate measurements on low strength specimens, for mod. C070 and C071
- C121** Safety guards to 89/392/CEE Directive, polycarbonate made, complete with hinges and lock
- C119** Fragment guard to 89/392/CEE Directive, polycarbonate sheet



C071 + C111-05

Additional accessories for specific tests listed at pag. 96÷101

Model	Hand Operated	Motorized	1 Gauge	2 Gauges	Digital display mod. C099 (see pag. 91)	Servo-Unit mod. C098 (see pag. 91)
C066	•		•			
C067	•			•		
C068		•	•			
C069		•		•		
C070		•			•	
C071		•				•



COMPRESSION TESTER 2000 kN CAPACITY

To test blocks max. 500x300 mm, cubes up to 300 mm side and cylinders up to dia. 160x320 mm

STANDARDS: ASTM C39, E447 - AASHTO T22 - UNI 6686, 1, 2 - DIN 51220 - NF P18-411 - BS 1610, 6073 - UNE 83304, 7242 - EN 771/3

TECHNICAL SPECIFICATIONS:

- Max. vertical daylight: 336 mm
- Compression platens 510x320x76 mm
- Gauges dia. 250 mm with specific resistance scales for cubes 150 mm and cylinders dia. 150 and 160 mm
- Gauges divisions: 2000 kN div. 5 kN - 600 kN div. 2 kN
- Hydraulic device to stop the piston's stroke at its max excursion
- Calibration accuracy: Grade 1.0
- Max. ram travel 55 mm approx.
- Power supply (motorized models): 220-240V 1 ph 50 Hz 750 W
- Dimensions: 870x600x1400 mm
- Weight: 850÷900 Kg

ACCESSORIES:

- C111-04** Distance piece to test cubes 200 mm side
- C111-05** Distance piece to test cubes 150 mm side
- C111-06** Distance piece to test cubes 100 mm side
- C111-07** Distance piece to test cylinders dia. 100x200 and 110x220 mm
- C105** Device with central screw for adjusting the light between the compression platens (see pag. 96)
- C120** Strip printer for mod. C077 and C078
- C124-02** Printer, A4 format for mod. C077 and C078
- C097** Dual low capacity digital range 0-500 kN for accurate measurements on low strength specimens, for mod. C077 and C078
- C121-01** Safety guards to 89/392/CEE Directive, polycarbonate made, complete with hinges and lock

Additional accessories for specific tests listed at pag. 96÷101



C077 + C120 + C105 + C111-09



C078 + C105 + C111-09

Model	Hand Operated	Motorized	1 Gauge	2 Gauges	Digital display mod. C099 (see pag. 91)	Servo-Unit mod. C098 (see pag. 91)
C073	•		•			
C074	•			•		
C075		•	•			
C076		•		•		
C077		•			•	
C078		•				•

COMPRESSION TESTER 3000 kN CAPACITY

To test blocks max. 500x300 mm, cubes up to 200 mm side and cylinders up to dia. 160x320 mm

STANDARDS: ASTM C39, E447 - AASHTO T22 - UNI 6686, 1, 2 - DIN 51220 - NF P18-411 - BS 1610, 6073 - UNE 83304, 7242 - EN 771/3

Model	Hand Operated	Motorized	1 Gauge	2 Gauges	Digital display mod. C099 (see pag. 91)	Servo-Unit mod. C098 (see pag. 91)
C080	•		•			
C081	•			•		
C082		•	•			
C083		•		•		
C084		•			•	
C085		•				•

TECHNICAL SPECIFICATIONS:

- Max. vertical daylight to test blocks and cubes: 288 mm
- Compression platens for blocks and cubes: 510x320x76 mm
- Max. vertical daylight to test cylinders: 334 mm
- Lower compression platen to test cylinders: dia. 216x30 mm
- Gauges dia. 250 mm with specific resistance scales for cubes 150 mm and cylinders dia. 150 and 160 mm
- Gauges divisions: 3000 kN div. 10 kN - 600 kN div. 2 kN
- Hydraulic device to stop the piston's stroke at its max excursion
- Calibration accuracy: Grade 1.0
- Max. ram travel 55 mm approx.
- Power supply (motorized models): 220-240 V 1 ph 50 Hz 750 W
- Dimensions: 900x600x1500 mm
- Weight : 1150÷1220 Kg



C084 + C120 + C111-05



C082

ACCESSORIES:

- C111-04** Distance piece to test cubes 200 mm side
- C111-05** Distance piece to test cubes 150 mm side
- C111-06** Distance piece to test cubes 100 mm side
- C111-07** Distance piece to test cylinders dia. 100x200 and 110x220 mm
- C105** Device with central screw for adjusting the light between the compression platens (see pag. 96)
- C120** Strip printer for mod. C084 and C085
- C124-02** Printer, A4 format for mod. C084 and C085
- C097** Dual low capacity digital range 0-500 kN for accurate measurements on low strength specimens, for mod. C084 and C085
- C121-01** Safety guards to 89/392/CEE Directive, polycarbonate made, complete with hinges and lock

Additional accessories for specific tests listed at pag. 96÷101

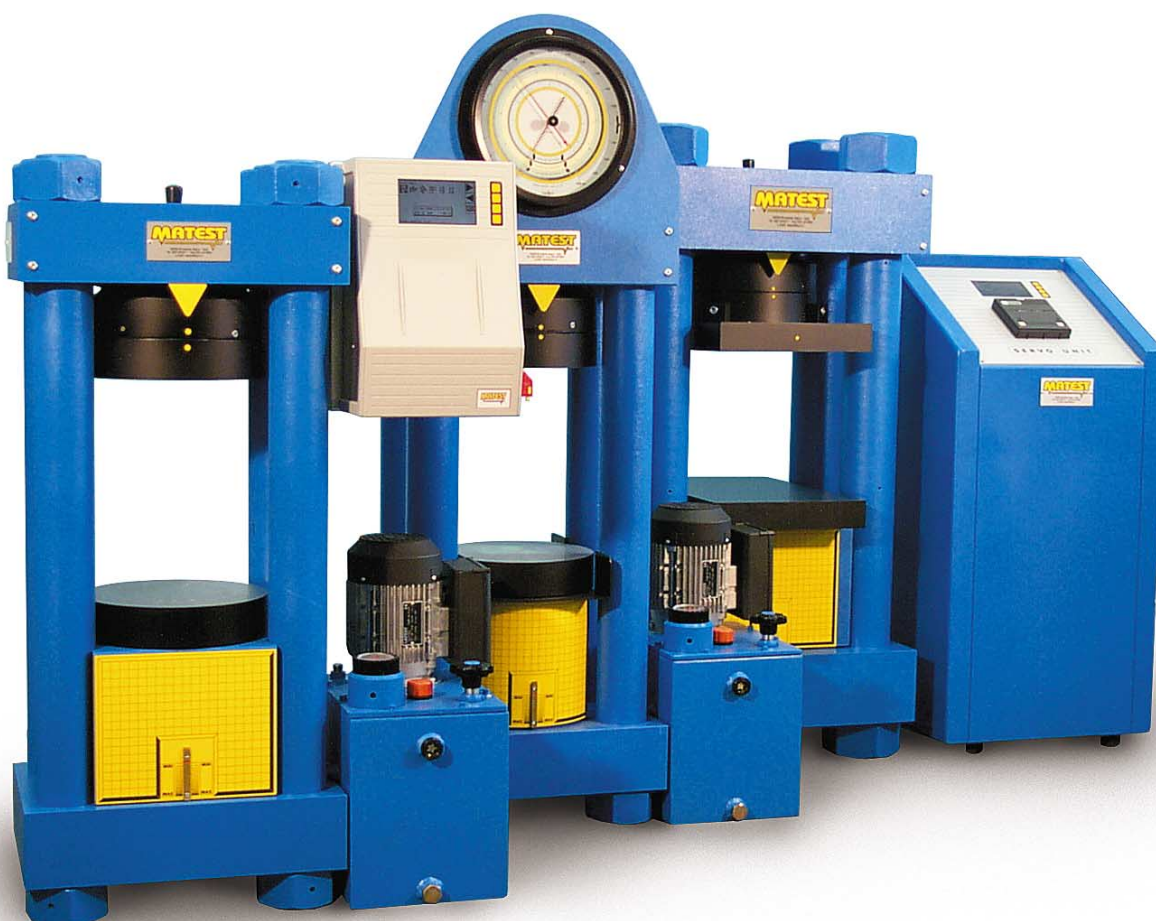


TECHNICAL FEATURES OF THE FOUR COLUMNS HIGH STABILITY FRAMES

STANDARDS: EN 12390/4, 12350/7 - BS 1881 - UNI 6686,1,2,3 - DIN 51220, 51302

section C

- Compression platens are hardened 60 HRC and rectified.
- Device to check piston's excursion during test.
- Hydraulic device to stop automatically the piston's stroke at its max excursion.
- Piston and cylinder are coupled with high quality packing set.
- Dial speed selector to visualize, pre-select and control the oil flow.
- Power pump is multipiston assuring continuity of delivery.
- Fast approach ram device to avoid dead times.
- The ball seating, in oil bath with null end float, is studied and manufactured to grant, during the starting phase of the test, an accurate self-alignment without frictions of the upper compression platen to the specimen. By applying the load, the ball seating assembly locks and keeps the position until the specimen's failure.
- The four columns frame is prestressed on 8 ring nuts and the clamping is obtained and checked by a dynamometric spanner; allowing to get a very high stiffness and stability on all load range and to keep these features in the time.



DIGITAL DISPLAY (mod. C099 - see pag. 91)

- Load value in: kN - Lbf - Tons
- Automatic load pacer
- RS 232 port for PC connection
- Safety overload program
- Storage of test results
- Connector to printer

"SERVO-UNIT" CONTROL CONSOLE
(mod. C098 - see pag. 91)

- Automatic testing through all phases
- Automatic control of load and pace rate
- User friendly software menu
- Software to print out test results and certificates



COMPRESSION TESTER 2000 kN CAPACITY HIGH STABILITY FRAME

To test cubes up to 200 mm side and cylinders up to dia. 160x320 mm

STANDARDS: EN 12390-4, 12350-7 - BS 1881-115, 1610 - UNI 6686, 1, 2, 3 - NF P18-411 - DIN 51220, 51302 - ASTM C39
AASHTO T22 - UNE 83304, 7242

TECHNICAL SPECIFICATIONS:

- Max. vertical daylight: 336 mm
- Compression platens dia. 287x60 mm
- Gauges dia. 250 mm with specific resistance scales for cubes 150 mm and cylinders dia. 150 and 160 mm
- Gauges divisions: 2000 kN div. 5 kN - 600 kN div. 2 kN
- Calibration accuracy: Grade 1.0
- Max. ram travel 60 mm approx.
- Power supply: 220-240 V 1 ph 50 Hz 750 W
- Dimensions: 690x400x1400 mm
- Weight: 850÷920 Kg

C089



C089-02 + C120 + C111-13

section C



81

Model	Motorized	1 Gauge	2 Gauges	Digital display mod. C099 (see pag. 91)	Servo-Unit mod. C098 (see pag. 91)	Servocontrolled mod. C124 (see pag. 95)
C089	•	•				
C089-01	•		•			
C089-02	•			•		
C089-03	•					•
C089-04	•				•	

ACCESSORIES:

- C111-12** Distance piece to test cubes 200 mm side
C111-13 Distance piece to test cubes 150 mm side
C111-14 Distance piece to test cubes 100 mm side
C120 Strip printer for mod. C089-02 and C089-04
C124-02 Printer, A4 format for mod. C089-02, C089-03 and C089-04
C097 Dual low capacity digital range 0-500 kN for accurate measurements on low strength specimens, for mod. C089-02 and C089-04
C121 Safety guards to 89/392/CEE Directive, polycarbonate made, complete with hinges and lock
C119 Fragment guard to 89/392/CEE Directive, polycarbonate sheet

Additional accessories for specific tests listed at pag. 96÷101



C089-03 + C124-02 + C111-13 + C104

MATEST

COMPRESSION TESTER 3000 kN CAPACITY HIGH STABILITY FRAME To test cubes up to 200 mm side and cylinders up to dia. 160x320 mm

STANDARDS: EN 12390:4, 12350:7 - BS 1881:115, 1610 - UNI 6686, 1, 2, 3 - NF P18-411 - DIN 51220, 51302 - ASTM C39
AASHTO T22 - UNE 83304, 7242

TECHNICAL SPECIFICATIONS:

- Max. vertical daylight 336 mm
- Compression platens dia. 287x60 mm
- Gauges dia. 250 mm with specific resistance scales for cubes 150 mm and cylinders dia. 150 and 160 mm
- Gauges divisions: 3000 kN div. 10 kN - 600 kN div. 2 kN
- Calibration accuracy: Grade 1.0
- Max. ram travel 60 mm approx.
- Power supply: 220-240V 1 ph 50 Hz 750 W
- Dimensions: 750x450x1500 mm
- Weight: 1200÷1250 Kg



C089-10 + C111-13

Model	Motorized	1 Gauge	2 Gauges	Digital display mod. C099 (see pag. 91)	Servo-Unit mod. C098 (see pag. 91)	Servocontrolled mod. C124 (see pag. 95)
C089-06	•	•				
C089-07	•		•			
C089-08	•			•		
C089-09	•					•
C089-10	•				•	



C089-08 + C121

ACCESSORIES:

- C111-12** Distance piece to test cubes 200 mm side
- C111-13** Distance piece to test cubes 150 mm side
- C111-14** Distance piece to test cubes 100 mm side
- C120** Strip printer for mod. C089-08 and C089-10
- C124-02** Printer, A4 format for mod. C089-08, C089-09 and C089-10
- C097** Dual low capacity digital range 0-500 kN for accurate measurements on low strength specimens, for mod. C089-08 and C089-10
- C121** Safety guards to 89/392/CEE Directive, polycarbonate made, complete with hinges and lock
- C119** Fragment guard to 89/392/CEE Directive, polycarbonate sheet

Additional accessories for specific tests listed at pag. 96÷101



COMPRESSION TESTER 3000 kN CAPACITY HIGH STABILITY FRAME

To test blocks max. 500x300 mm, cubes up to 200 mm side and cylinders up to dia. 160x320 mm

STANDARDS: EN 12390:4, 12350:7, 771:3 - BS 1881:115, 1610, 6073 - UNI 6686, 1, 2, 3 - NF P18-411 - DIN 51220, 51302
ASTM C39, E447 - AASHTO T22 - UNE 83304, 7242

TECHNICAL SPECIFICATIONS:

- Max. vertical daylight to test blocks: 242 mm
- Compression platens for blocks: 510x320x76 mm
- Max. vertical daylight to test cubes and cylinders: 336 mm
- Compression platens to test cubes and cylinders: dia. 287x60 mm
- Gauges dia. 250 mm with specific resistance scales for cubes 150 mm and cylinders dia. 150 and 160 mm
- Gauges divisions: 3000 kN div. 10 kN - 600 kN div. 2 kN
- Calibration accuracy: Grade 1.0
- Max. ram travel 60 mm approx.
- Power supply: 220-240V 1 ph 50 Hz 750 W
- Dimensions: 750x520x1500 mm
- Weight: 1350÷1400 Kg



C089-17



C089-19 + C120

ACCESSORIES:

- C111-12** Distance piece to test cubes 200 mm side
- C111-13** Distance piece to test cubes 150 mm side
- C111-14** Distance piece to test cubes 100 mm side
- C120** Strip printer for mod. C089-17 and C089-19
- C124-02** Printer, A4 format for mod. C089-17, C089-18 and C089-19
- C097** Dual low capacity digital range 0-500 kN for accurate measurements on low strength specimens, for mod. C089-17 and C089-19
- C121-01** Safety guards to 89/392/CEE Directive, polycarbonate made, complete with hinges and lock

Additional accessories for specific tests listed at pag. 96÷101

Model	Motorized	1 Gauge	2 Gauges	Digital display mod. C099 (see pag. 91)	Servo-Unit mod. C098 (see pag. 91)	Servocontrolled mod. C124 (see pag. 95)
C089-15	•	•				
C089-16	•		•			
C089-17	•			•		
C089-18	•					•
C089-19	•				•	



COMPRESSION TESTER 5000 kN CAPACITY

To test cubes up to 300 mm side and cylinders up to dia. 250x500 mm

STANDARDS: BS 1610, 6073 - UNI 6686, 1, 2 - NF P18-411 - DIN 51220, 51302 - ASTM C39, E447 - AASHTO T22 - UNE 83304, 7242

TECHNICAL SPECIFICATIONS:

- Max. vertical daylight: 530 mm
- Compression platens 310x310 mm
- Gauges dia. 250 mm with specific resistance scales for cubes 150 mm and cylinders dia. 150 and 160 mm
- Gauges divisions: 5000 kN div. 15 kN - 600 kN div. 2 kN
- Distance pieces to test cubes 150, 200, 300 mm; cylinders dia. 150, 160 mm included
- Calibration accuracy: Grade 1.0
- Max. ram travel 60 mm approx.
- Power supply: 220-240V 1 ph 50 Hz 750 W
- Dimensions: 1200x900x1900 mm
- Weight: 2800÷2900 Kg

ACCESSORIES:

- C112-01** Upper and lower compression platens 510x320x76 mm to test also blocks
- C120** Strip printer for mod. C088 and C088-01
- C124-02** Printer, A4 format for mod. C088, C087-01 and C088-01
- C097** Dual low capacity digital range 0-1000 kN for accurate measurements on low strength specimens, for mod. C088 and C088-01
- C121-04** Safety guards to 89/392/CEE Directive, polycarbonate made, complete with hinges and lock

Additional accessories for specific tests listed at pag. 96÷101

section C

C088

Model	Motorized	1 Gauge	2 Gauges	Digital display mod. C099 (see pag. 91)	Servo-Unit mod. C098 (see pag. 91)	Servocontrolled mod. C124 (see pag. 95)
C086	•	•				
C087	•		•			
C088	•			•		
C087-01	•					•
C088-01	•				•	



FLEXURAL TESTING MACHINES

Three basic design are available:

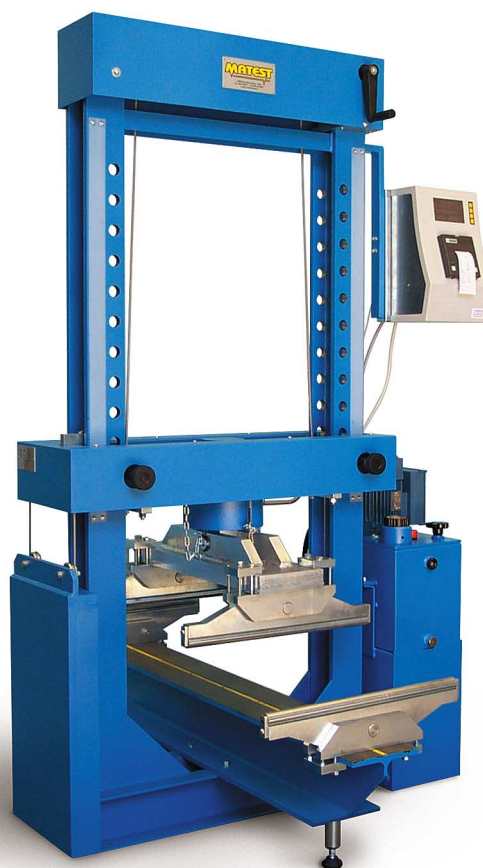
- **C090** Serie to perform flexural tests on concrete beam specimens having max. dimensions of 150x150x750 mm conforming to the Specifications: EN 12390/5 - UNI 6133 - ASTM C78, C293 AASHTO T97 - BS 1881:118 - UNI 6133 - UNE 83305 NF P18-407

C091 SERIE



C090 SERIE

- **C091** Serie to perform flexural tests on concrete beam specimens having max. dimensions of 200x200x800 mm conforming to the a.m. Specifications, and in addition to perform tests on:
 - Flat blocks (max. width 500 mm) conforming to the BS 6073/1
 - Flagstones and Kerbs conforming to the BS 7263
 - Kerbs conforming to the NF P98-302
- **C093** Serie to perform flexural tests on concrete beam specimens having max. dimensions 200x200x800 mm and to perform tests on any kind of other product with max. dimensions 550x550 mm (adjustable distance between lower rollers up to max. 1300 mm)



C093 SERIE

All series are proposed in the models: Hand Operated, Motor Operated, with Digital Display, and Servocontrolled.

It is also possible, by using suitable accessories, to perform the following tests:

- Compression test on portions of 40.1x40x160 mm mortar prisms broken in flexure conforming to EN 196, DIN 1164 Specifications (compression devices mod. E170, E170-01 - see pag. 98)
- Compression tests on 50 mm mortar cubes, conforming to ASTM C109 (Compression device mod. E171 - see pag. 98)
- Compression tests on 70 mm mortar cubes, conforming to BS 4550 (Compression device mod. E171-01 - see pag. 98)
- Splitting tensile test on cylindrical specimens dia. 100, 150, 160 mm conforming to EN 12390/6 - NF P18-408 - BS 1881:117 ASTM C496 - UNI 6135 (Device mod. C100 - see pag. 97)
- Splitting tensile test on concrete cubes and concrete block pavers, conforming to EN 12390/6, 1338 (Device mod. C103 - see pag. 97)



FLEXURAL TESTING MACHINE 150 kN CAPACITY

To perform flexural tests on concrete beam specimens max. dimensions 150x150x600 (750) mm

STANDARDS: EN 12390/5 - ASTM C78, C293 - AASHTO T97 - BS 1881:118 - NF P18-407 - UNE 83305 - UNI 6133

Model	Hand Operated	Motorized	I Gauge	Digital display mod. C099 (see pag. 91)	Servo-Unit mod. C098 (see pag. 91)
C090	•		•		
C090-01		•	•		
C090-02		•		•	
C090-03		•			•

section C



C090-03 + C120



C090



C090-01

TECHNICAL SPECIFICATIONS:

- Max. vertical daylight between upper/lower rollers: 160 mm
- Rollers dimensions: dia. 40x160 mm
- Complete with 4 adjustable and articulated rollers for two point loading
- Distance between lower rollers adjustable from 100 to 455 mm
- Distance between upper rollers adjustable from 40 to 155 mm
- Possibility to easily place in the centre one upper roller for centre point loading
- Rollers are hardened, casehardened and rectified
- Graduated scales are foreseen to get easy roller's adjustment
- Gauge diameter 250 mm and div. 0.5 kN
- Max. ram travel 50 mm approx.
- Power supply (motorized models): 220-240 V I ph 50 Hz 750 W
- Dimensions: 540x460x960 mm
- Weight: 180÷240 Kg.

ACCESSORIES:

- C111-16** Distance piece to test beams 100x100x400 (500) mm
- C120** Strip printer for mod. C090-02 and C090-03
- C124-02** Printer, A4 format for mod. C090-02 and C090-03
- C097** Dual low capacity digital range 0-50 kN for accurate measurements on low strength specimens, for mod. C090-02 and C090-03

Additional accessories for specific tests listed at pag. 96÷101

Note: Digital models C090-02 and C090-03 are available (upon request) with lower capacity range (for ex. 0-100 kN) to improve measurements accuracy.



FLEXURAL TESTING MACHINE 150 kN CAPACITY

To perform flexural tests on concrete beam specimens max. dimensions 200x200x800 mm; flat blocks (max. width 500 mm); flagstones, kerbs, tiles, slabs, masonry units, etc.

STANDARDS: EN 12390/5 - ASTM C78, C293 - AASHTO T97 - BS 1881:118, 6073/1, 7263 - NF P18-407, P98-302 - UNE 83305 - UNI 6133

TECHNICAL SPECIFICATIONS:

- Max. vertical daylight between upper/lower rollers: 210 mm
- Rollers dimensions: dia. 30x550 mm
- Complete with 4 adjustable and articulated rollers for two point loading
- Distance between lower rollers adjustable from 75 to 525 mm
- Distance between upper rollers adjustable from 40 to 180 mm
- Possibility to easily place in the centre one upper roller for centre point loading
- Graduated scales are foreseen to get easy roller's adjustment
- Gauge diameter 250 mm and div. 0.5 kN
- Ram travel 110 mm approx.
- Simple action piston with counterweights to optimize frictions
- Power supply (motorized models): 220-240 V 1 ph 50 Hz 750 W
- Dimensions: 950x600x1200 mm
- Weight: 350÷400 Kg



C091-02 + C120



C091-01
WITH CENTRE UPPER ROLLER

ACCESSORIES:

- C111-17** Distance piece 100 mm height
- C120** Strip printer for mod. C091-02 and C091-03
- C124-02** Printer, A4 format for mod. C091-02 and C091-03
- C097** Dual low capacity digital range 0-50 kN for accurate measurements on low strength specimens, for mod. C091-02 and C091-03

Additional accessories for specific tests listed at pag. 96÷101

Note: Digital models C091-02 and C091-03 are available (upon request) with lower capacity range (for ex. 0-100 kN) to improve measurements accuracy.



Model	Hand Operated	Motorized	I Gauge	Digital display mod. C099 (see pag. 91)	Servo-Unit mod. C098 (see pag. 91)
C091	•		•		
C091-01		•	•		
C091-02		•		•	
C091-03		•			•

UNIVERSAL FLEXURAL AND TRANSVERSE MACHINE 150 kN CAPACITY

To perform flexural tests on concrete beam specimens max. size 200x200x800 mm, flat blocks, flagstones, kerbs, tiles, slabs, masonry units, pipes, and any type of material having max. size 550x550 mm (lower rollers max. length 1300 mm)

STANDARDS: EN 12390/5 - ASTM C78, C293 - AASHTO T97
BS 1881:118, 6073/1, 7263 - NF P18-407, P98-302
UNE 83305 - UNI 6133

section C

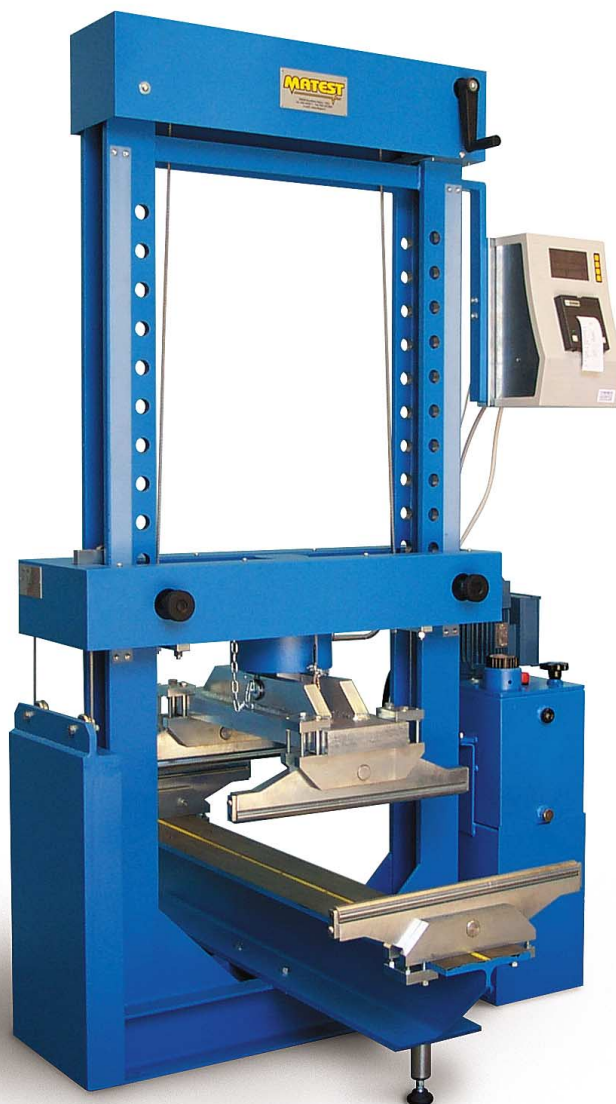


88

TECHNICAL SPECIFICATIONS:

- Max. vertical daylight between upper/lower rollers: 550 mm adjustable by hand winch with counterweights
- Rollers dimensions: dia. 30x550 mm
- Complete with 4 adjustable and articulated rollers for two point loading
- Distance between lower rollers adjustable from 75 to 1325 mm
- Distance between upper rollers adjustable from 75 to 575 mm
- Possibility to easily place in the centre one upper roller for centre point loading
- Graduated scales are foreseen to get easy roller's adjustment
- Gauge diameter 250 mm and div. 0.5 kN
- Ram travel 110 mm approx.
- Simple action piston with counterweights to optimize frictions
- Power supply (motorized models): 220-240 V 1 ph 50 Hz 750 W
- Dimensions: 970x1400x2000 mm
- Weight: 800÷850 Kg

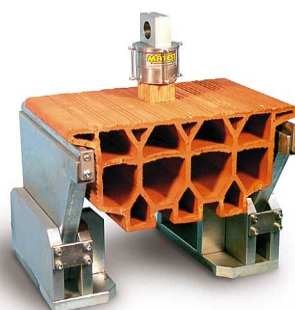
C093-02 + C120



ACCESSORIES:

- C093-11** Device for flexural test on clay blocks for flooring.
Standard: UNI 9730-3.
It consists of two lower bearers dia. 20x300 mm and upper square wooden pressure punch
- C120** Strip printer for mod. C093-02 and C093-03
- C124-02** Printer, A4 format for mod. C093-02 and C093-03
- C097** Dual low capacity digital range 0-50 kN for accurate measurements on low strength specimens, for mod. C093-02 and C093-03

Additional accessories for specific tests listed at pag. 96÷101



C093-11

Model	Hand Operated	Motorized	I Gauge	Digital display mod. C099 (see pag. 91)	Servo-Unit mod. C098 (see pag. 91)
C093	•		•		
C093-01		•	•		
C093-02		•		•	
C093-03		•			•



UNIVERSAL GROUP FOR:

- COMPRESSION TESTS ON CONCRETE SPECIMENS AND BLOCKS
- FLEXURAL TESTS ON CONCRETE BEAMS
- COMPRESSION TESTS ON MORTAR SPECIMENS
- SLITTING CYLINDER TESTS

The composition of the Universal Group is obtained by:

C092

Flexural frame 150 kN capacity, complete with dial gauge (see mod. C090-01 for technical specifications), fitted with a three-way hydraulic valve, used in conjunction with an existing compression testing machine (see mod. C013÷C089-16) dial gauge reading, motorized. Complete with pipes, connectors, accessories.

C092-01

Flexural frame 150 kN capacity, complete with pressure transducer and electronic digital display unit with micro-processor (see mod. C090-02 and C099), fitted with a three-way hydraulic valve, used in conjunction with an existing electronic digital display compression machine (see mod. C015÷C089-17). Complete with pipes connectors, accessories.

C092-02

Flexural frame 150 kN capacity, complete with automatic servocontrolled control console and microprocessor (see mod. C090-03 and C098), used in conjunction with an existing automatic servocontrolled compression machine (see mod. C016÷C089-19). Complete with pipes connectors, accessories.



C053

C092



C055

C092-01



C089-02

C092-02

This Universal Group offers the considerable advantage to perform compression tests on concrete cube, cylinder and block specimens; flexural tests on concrete beams, and by using suitable accessories, to perform also the following tests:

- Compression on portions of 40.1x40x160 mm mortar broken in flexure conforming to EN 196, DIN 1164 Specifications (Devices mod. E170, E170-01 - see pag. 98)
- Compression on 50 mm mortar cubes, conforming to ASTM C109 (Device mod. E171 - see pag. 98)
- Compression on 70 mm mortar cubes, conforming to BS 4550 (Device mod. E171-01 - see pag. 98)
- Splitting tensile on cylindrical specimens dia. 100, 150, 160 mm conforming to EN 12390/6 - NF P18:408 - ASTM C496 - UNI 6135 BS 1881:117 (Device mod. C100 - see pag. 97)
- Splitting tensile on concrete cubes and concrete block pavers, conforming to EN 12390/6, 1338 (Device mod. C103 - see pag. 97)

An hydraulic three-way valve activates alternatively the compression or the flexural frame, by utilizing only one hydraulic pumping unit. The universal group is combined according to the specific exigences (technical and economic) of the customer, by choosing the compression unit among our different available models (C013 to C089-19) with max. capacity of 1200 kN to 5000 kN.

FRAMES GROUP for:

- COMPRESSION TESTS ON CONCRETE SPECIMENS AND BLOCKS
- COMPRESSION TEST ON MORTAR SPECIMENS

The composition of this group is obtained by:

C092-05

Compression frame on mortar specimens, 250 kN or 500 kN capacity, complete with pressure transducer (see mod. E159 and C099), fitted with a three-way hydraulic valve used in conjunction with an electronic digital display concrete compression machine (see mod. C015÷C089-17). Complete with pipes, connectors, accessories.

C092-06

Compression/Flexural frame on mortar specimens, dual range:

0-250 kN (or 500 kN) for compression tests

0-15 kN for flexure tests

complete with two pressure transducers (see mod. E160 and C099), used in conjunction with an electronic digital display concrete compression machine (see mod. C015 ÷ C089-17). Complete with pipes, connectors, accessories.

C092-07

Compression frame on mortar specimens, 250 kN or 500 kN capacity, (see mod. E159 and C098), used in conjunction with an automatic servocontrolled concrete compression machine (see mod. C016÷C089-19). Complete with pipes, connectors, accessories.

The group is combined according to the specific exigences (technical and economic) of the customer; by choosing the concrete compression frame among the different available models (mod. C015 to C089-19) with max. capacity of 1200 kN to 5000 kN

In addition to the proposed groups, it is possible to compose many other alternative testing groups, with digital display measuring system (mod. C099) or with automatic servocontrolled "Servo-Unit" system (mod. C098); like for ex.

- Group formed by two concrete compression frames

- Group formed by one concrete flexural frame and one mortar compression frame;



C055

C092-05



C089-02

C092-07



or with a Matest frame and an existing frame also of other brands. Our technical department is at your disposal to solve any specific exigence.





DIGITAL UNITS WITH MICROPROCESSOR FOR LOAD MEASUREMENT

Recommended to update existing testing machines, to provide fully automatic tests through all phases, or to compose a testing group of two frames.

C099

Electronic computerized digital display unit with microprocessor

For any type of testing machine.



C099 + C120

COMPRESSION TEST

```

Date       : 18/04/2001
            14:23:49

Group No.  : 25

Test No.   : 150
Diameter   : 160.0 mm
Height     : 320.0 mm
Area       : 20105.6 mm²
Spec. weight : 16.73 kg
Curing days : 28
Test conditions : .....

Spec. aspect : .....

Max. Load   : 895.7 kN
Strength     : 44.5 MPa
Pace rate    : 0.50 MPa/s
Env. Temperature : 20 deg.C
Failure type  : .....

NOTES       : .....

Operator    : .....
```

PRINTING EXAMPLE WITH MOD. C120

Power supply: 220-240 V 1ph 50 Hz 750 W
 Dimensions: 250x180x400 mm
 Weight: 5 Kg

C098

"Servo-unit". Servo-controlled automatic console for testing machines

For use with testing machine frame to provide fully automatic testing through all test phases. Provides automatic control of load and pace rate and the software to print out results and certificates.

GENERAL FEATURES

This compact console incorporates an electric motor, hydraulic unit, and microprocessor with display and keyboard. As an independent unit, it can be fitted to MATEST or other brands of machines. This facility provides fully automatic testing with user friendly software menus.

HYDRAULIC UNIT

Composed of a multi-piston electric pump with microprocessor controlled variable output. A quiet and reliable system for continuous and consistent testing. All parts easily accessible for servicing.

AUTOMATIC EXECUTION OF "COMPRESSION, FLEXURE, CYLINDER TENSILE SPLITTING" TESTS

Each cycle for these tests is fully automatic ... rapid approach of platens, automatic zeroing, auto application of load at the pre-set pace rate, continuous load display, max load indication, calculation of specific resistance. The pace rate can be set in N/mm²•s and kN/s. When a test is complete, the machine is automatically set up for the new test.



C098 + C120

Power supply: 220-240 V 1ph 50 Hz 750 W
 Dimensions: 400x400x1000 mm
 Weight 60 Kg



Technical specifications for both mod. C098 and C099

ELECTRONIC UNIT

Large graphic display (see pictured examples).

Simple 4 push button multi function keyboard and encoder. Each button has a different function and activates a different menu. Each change of function/menu activates a separate symbol on the display.

The encoder allows an easy and quick setting of the different parameters.

Base memory (ROM) 128 Kb

RAM memory 128 Kb System frequency 20 MHz.

Can be operated with 3 mV/V sensors, transducers or load cells

Software selection allows choice of one or two load measuring ranges. (Accessory)

Can be used with a strip printer directly installed (accessory mod. C120) or with a remote A4 format printing unit (accessory mod. C124-02) connected to the rear.

RS 232 port for PC data transfer

Safety magneto thermal switch to protect the motor.

A percentage of the maximum possible load can be set during the test to arrange a cut off before the crumbling or destruction of the specimen.

Possibility to introduce the area of special sized or irregular shaped specimens.

A calibration program which allows modification when used with a machine with non linear characteristics. There is provision for a scale division from a minimum of two up to a maximum of ten calibration steps.

This arrangement facilitates complete calibration on all machines.

Test parameters and results expressed in kN, Tons and Lbf.

Auto safety shut down at maximum load

Protection system password which is secure.

The advanced program has the following menus:

MANUAL EXECUTION OF "COMPRESSION, FLEXURE, CYLINDER TENSILE SPLITTING" TESTS

The program is set for each of the above tests and the buttons indicate the functions to manually check the complete test. Continuous load display, maximum load indication, calculation of specific resistance are all automatic.

During the tests, the display shows the nominal and the applied pace rate to allow modification by the operator. The pace rate can be set in N/mm²•s and kN/s.

On test completion, the unit is automatically set up for the new test.

Compr. Spec. Type 18						 ON
a	40.0	(mm)	group	0		
b	40.0	(mm)	test	13		
h	40.0	(mm)	days	0		
Ø	-----	(mm)	speed	0.5	Mpa/s	
w	0.15	(kg)	temp	20	°C	
Req. <input type="text"/>						
Curr. <input type="text"/>						
MPa <input type="text"/>				kN <input type="text" value="-0.01"/>		

EXAMPLE OF DISPLAYED DATES

No.	a(mm)	b(mm)	h(mm)	Ø(mm)	kg
1	40.0	40.0	40.0	----	0.15
2	50.0	50.0	50.0	----	0.30
3	70.0	70.0	70.0	----	0.82
4	100.0	100.0	100.0	----	2.60
5	150.0	150.0	150.0	----	8.77
6	200.0	200.0	200.0	----	20.80
7	300.0	300.0	300.0	----	70.20
8	----	----	100.0	50.0	0.51
9	----	----	120.0	60.0	0.88
10	----	----	200.0	100.0	4.08
11	----	----	220.0	110.0	5.44
12	----	----	300.0	150.0	13.78
13	----	----	320.0	160.0	16.73
14	----	----	500.0	250.0	63.80

Channel 1 Setup		 +
Offset delay	2048 msec	
Start test at	100 pts.	
Min. test time	2048 msec	
Stop test at	90 % of max.	
Enabled	ON	 -
Channel 2 Setup		
Offset delay	2048 msec	
Start test at	100 pts.	
Min. test time	2048 msec	
Stop test at	90 % of max.	 OK
Enabled	ON	



SPECIMEN DEFINITION

The function facilitates the creation of a file showing the characteristics of different specimens under each possible test (compression, flexure, cylinder tensile splitting). The file can store the characteristics of the specimens for easy recall when additional data is required to be added. This includes:

- The control number of the specimen which will be used in all menus
- The specimen dimensions (side "a", side "b", and height "h" if it is a cube, or diameter Ø and height "h" if it is a cylinder).
 - The distance between upper and lower blades (for flexure test)
- The option to provide each specimen with an identification number / lot.

FILES MANAGEMENT

The following options are available for any test:

- Automatic print out of results after every single test
 - Printing out of test results on file
- Automatic transfer to PC (thru RS 232) after every test
 - Transfer of all file data to PC (thru RS 232)
- Automatic saving of data on file after every test
 - Ability to clear all data on file

ALARM

Optional to set alarm triggered by load value.

CLOCK SETUP

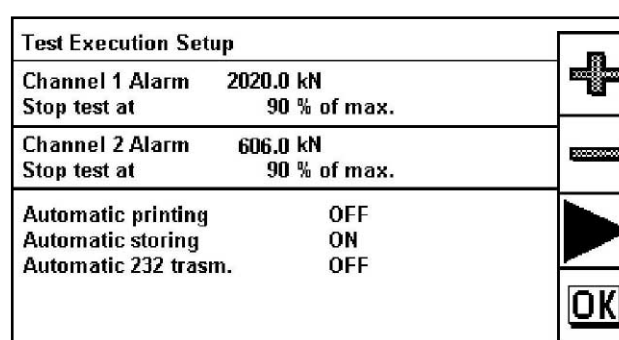
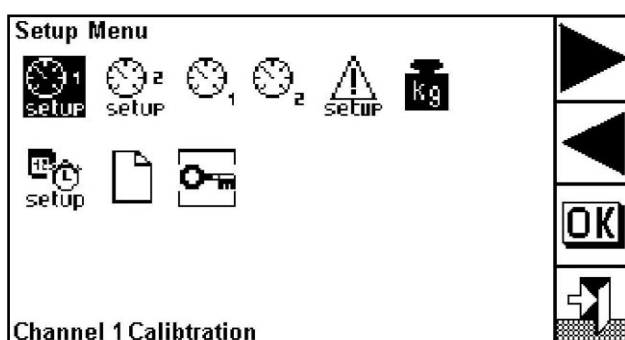
Option to set calendar (year, month and day) and the time (hour, minute and seconds)

CERTIFICATE PREPARATION

Menu provides option to choose which of the following is required:

- Specimen number / lot
- Specimen surface
- Specimen weight
- Effective pace rate
- Age of specimen when test run
- Condition of specimen
- Specimen description
- Laboratory working temperature
- Way specimen has failed
- Signature of operator
- Notes

EXAMPLE OF DISPLAYED DATES



C099-01

Electronic digital display unit "dual range"

Similar to mod. C099 but with "two channels" so that it can accept two pressure transducers (or load cells), to operate two testing frames, or to operate with two different measuring ranges on the same loading frame.

C099-02

Electronic digital display unit "Three Channels"

Similar to mod. C099 but with "Three Channels", so that it can accept three pressure transducers (or load cells) to operate three testing frames; or to operate with one frame plus two different measuring ranges on the other frame.

ACCESSORIES AND SPARES FOR THE DIGITAL SYSTEM
MOD. C098 AND C099.

C099-10

Data acquisition program

This program allows transferring the data and results of each test, from C098 or C099 unit to a PC.

Through the RS232 port of the digital display, the dates are transferred on a table "dbase" format.

The dates contained in the table can be read, memorized, stored and managed through the functions of microsoft Excell or Word programs, but relevant development has to be prepared by the enduser. The program is supplied on CD rom and it does not include Windows, Excel and Word which have to be already installed on the PC used for the data acquisition.

C120

Strip printer for automatic printing of tests results (see printed example). Directly installed in C098 or C099 unit.

C120-01

Paper roll for C120 printer: Pack of 10

C120-02

Ribbon cartridge for C120 printer: Pack of 3.

C124-02

Printer A4 format, to automatically print test results.

PRESSURE TRANSDUCER

To be utilized in conjunction with the electronic computerized digital display mod. C099, or with the Servo-Unit console mod. C098. It is supplied complete with cable connection and calibration certificate. Available models: see pag. 100

C098-01

"Servo unit- dual range"

Servo controlled automatic console for testing machines

Similar to mod. C098 but with two channels to operate with two different measuring ranges on the same loading frame.

C098-02

"Servo unit - dual frame"

Servo controlled automatic console, similar to mod. C098 but with two channels and three way hydraulic valve to activate, alternatively, two testing frames.



C098-02 + C120

EXAMPLE OF DISPLAYED DATES WITH MOD. C098 AND C099

Capacity 2000 kN			
Step no.10			
Step	kN	R.Pts	Pts
0	0.0	0	R
1	200.0	1709	A
2	400.0	3414	
3	600.0	5100	
4	800.0	6804	
5	1000.0	8493	
6	1200.0	10192	
7	1400.0	11867	
8	1600.0	13573	
9	1800.0	15263	
10	2000.0	16952	

Units Measuring System Setup			
Force	Length	Area	Strength
kN	mm	mm ²	MPa
ton	mm	cm ²	kg/cm ²
lbf	in	in ²	psi
Language selection			
IT	GB	FR	ES

**C124****Automatic servocontrolled power unit system for testing machines**

To be connected to a compression or flexure testing frame for a fully automatic test cycle including automatic rate of loading.

GENERAL FEATURES

Compact design frame comprising hydraulic, electric and electronic unit.

Possibility of connection to a testing frame Matest manufacture (or also of other manufacturers).

The unit includes a PC for data introduction using alphanumeric keyboard and mouse.

Data visualization, test phases and results through colour 14" monitor.

Possibility to connect parallel printer (accessory).

Possibility to introduce various capacity reading ranges.

All the operations are menu driven so to supply an enduser friendly interface, with possibility to select on the monitor the following languages: English, French, Spanish, Italian.

HYDRAULIC FEATURES:

Self-ventilated pump

Proportional valve suitable for an infinitesimal regulation

Overload protection valve

Pressure discharge electrovalve

ELECTRONIC FEATURES

This unit allows the enduser to perform in rational and quick system one of the following test programs:

A) Compression program

Operating in "Windows" system, it is composed by different menus allowing to set all parameters needed for a fully automatic test cycle, like: rate of loading, customer code, order number, test date, specimen date, specimen number, specimen dimensions and weight etc.

All this allows to speed up as much as possible a test cycle.

When introduction of these data will be completed, area and weight-volume will be automatically calculated, while, at the end of the test, the maximum reached peak and the specific strength will be visualized.

The program foresees a set of files to store various data like:

Test file:

Calibration channel

Unit measure	kN	kN/sq.mm. Mpa
	Lbf	Lbf/sq.in.
	Kg	Kg/sq.cm

B) Flexure program:

Basically similar to the compression program, but addressed to flexure tests on concrete or mortar specimens.

Power supply: 400V 3ph 50 Hz

Dimensions: 620x620x1600 mm

Weight: 180 Kg. approx.

**C124 + C124-02****ACCESSORIES:****C124-02**

Printer, A4 format to print the test results

C124-07

CERTIFICATE PROGRAM. It allows to elaborate "Personalized" test certificates. The enduser, by calling relevant results of the memorized tests in the different files, will couple the same to the data referred to the customer. This program can be activated both on the same automatic servocontrolled power unit system, and on a PC connected to the net.

C124-09

Split cylinder program, to perform traction tests by cleavage (known as "Brazilian" test) on concrete cylindrical specimens. **STANDARDS:** UNI 6135-72 - ASTM C496 - NF P18-408 - BS 1881. This program automatically manages the tests by elaborating the values and by giving relevant results.

ACCESSORIES AND SPARE PARTS TO COMPRESSION AND FLEXURAL TESTING MACHINES

C097

Dual low capacity digital range (normally 1/3 of the nominal range), fitted on testing machines equipped with digital display measuring unit mod. C099, or with automatic "Servo-unit" mod. C098, or with servocontrolled unit mod. C124.

The operator, in addition to the nominal scale, will have available also a second low range scale, particularly suitable for accurate measurements on specimens of low strength.

C097-01

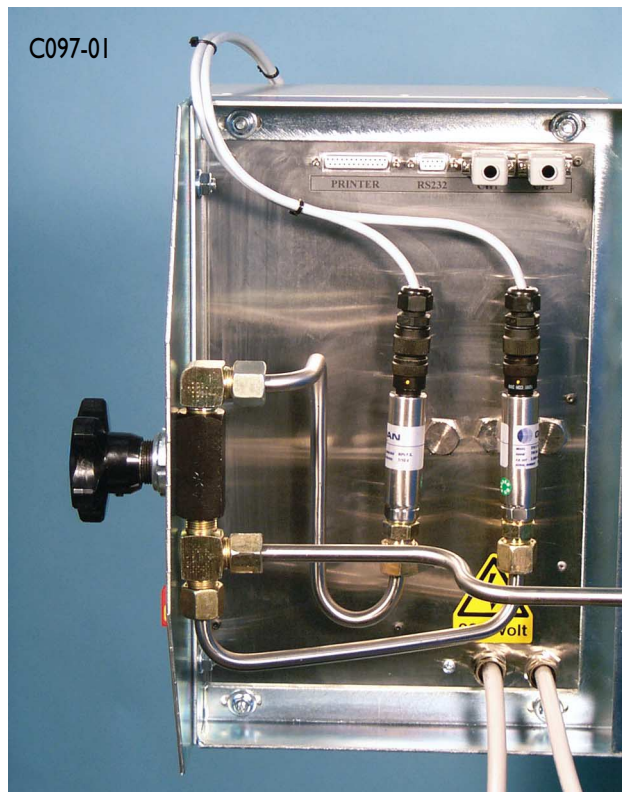
Dual low capacity digital range (recommended range 0-250 kN), complete with **"Appropriate pressure transducer"**, hydraulic installation and cock, fitted on testing machines equipped with digital display measuring unit (mod. C099) or with automatic "Servo-Unit" (mod. C098).

This solution offers very high accuracy also for measurements of low strength, which is necessary to perform compression tests on mortar specimens, flexural tests on concrete beams, split cylinder test on cylinder and cube specimens, by utilizing a concrete compression machine (mod. C015 to C089-19).

C097-02

Dual low capacity digital range 0-300 kN, complete with **"Electrical strain load cell"**, distance piece, cables, fitted on concrete compression testing machines equipped with digital display measuring system (mod. C099 and C098). This solution eliminates the weights of the piston and lower compression platen, paking set frictions etc., granting very high accuracy (Class A; max. error within $\pm 0,5\%$) in the measuring range 30÷300 kN; ideal for compression tests on mortar specimens.

C097-01



C105

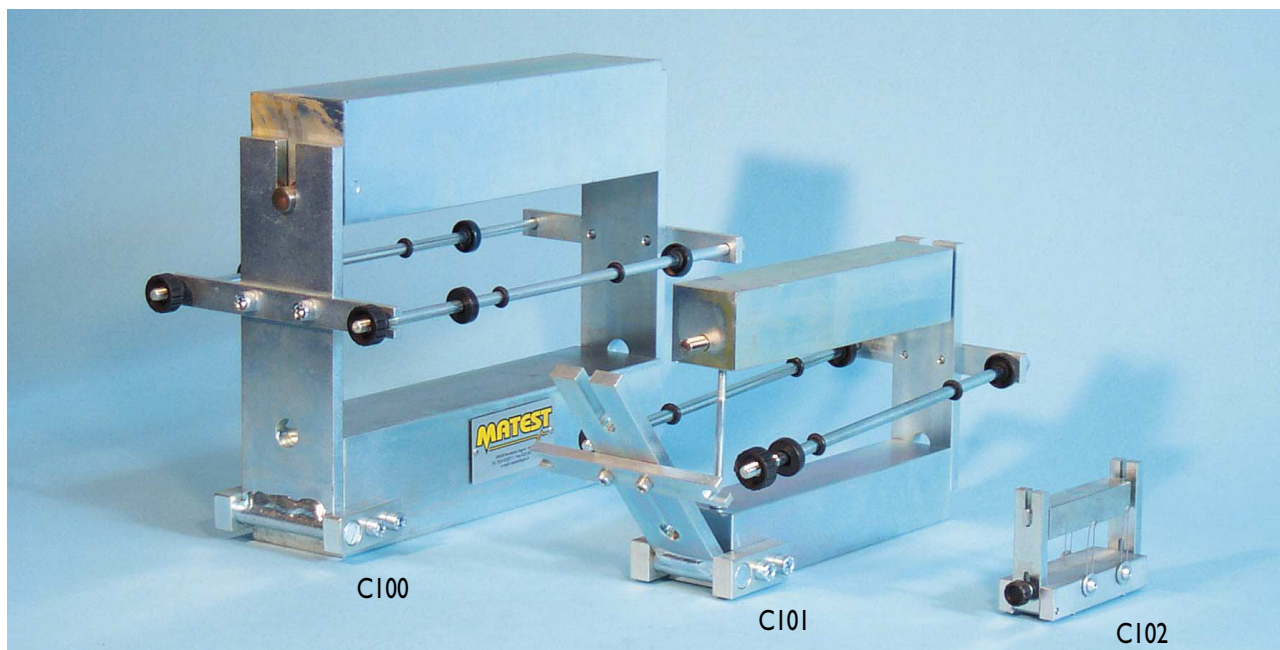
Device with central screw

Very practical to adjust the light between the compression platens of a machine, according to the height of the specimen to be tested. Recommended solution for machines equipped with big sized platens.

This device can be foreseen on all models of concrete compression machines.

C105



**C100**

Splitting tensile test device, for cylindrical specimens dia. 150x300 mm, 160x320 mm, 6" x 12"

STANDARDS: ASTM C496 - NF P18-408 - EN 12390/6
UNI 6135 - BS 1881:117

To perform the test, this device has to be used with a concrete compression machine foreseen of a low capacity measuring range (mod. C097-01) or with a flexural frame.

Weight: 30 Kg

C101

Splitting tensile test device, same to mod. C100 but to perform tests on cylindrical specimens dia. 100x200 mm, 110x220 mm, 4" x 8"

Weight: 15 Kg

C101-01

Splitting tensile test device, for cylindrical specimens from dia. 100x200 mm (4"x8") to dia. 160x320 mm (6"x12"). The base is equipped with flat springs centering and keeping in position the specimen.

Two columns with adjustable height sustain the upper plate by two springs.

This item is an alternative solution to mod. C100 + C101

Weight: 26 Kg

C102

Splitting tensile test device, to perform tests on cylindrical specimens dia. 40x80 mm

Weight: 1 Kg

C103

Splitting tensile test device to perform tests on concrete cube specimens 100 and 150 mm and on concrete block pavers

STANDARDS: EN 12390/6, 1338

To perform the test, this device has to be used with a concrete compression machine foreseen of low capacity measuring range (mod. C097-01) or with a flexural frame.

Weight: 26 Kg



ACCESSORIES:

C100-01

Packing strips, hard board made, dimensions 4x10x350 mm to be used for splitting tensile tests with mod. C100, C101, C101-01. Pack of 100

C100-02

Packing strips, hard board made, dimensions 4x15x350 mm to be used for splitting tensile tests with mod. C103. Pack of 100



C106

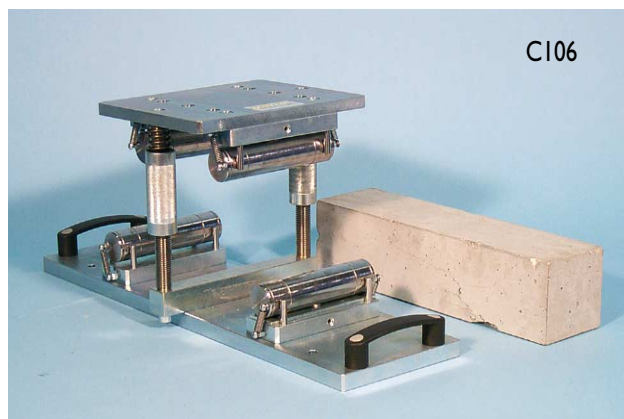
Flexural device for two point and centre point tests on concrete beams 100x100x400 (500) and 150x150x600 (750) mm

STANDARDS: EN 12390/5 - UNI 6133 - NF P18-407 - UNE 83305
ASTM C78, C293 - AASHTO T97 - BS 1881:118

Equipped with two lower rollers, one of them articulated, and two upper rollers for third point tests.

It is possible to place in the centre only one upper roller for centre point tests.

To perform the flexural test, this device has to be used with a concrete compression machine foreseen of low capacity measuring range (mod. C097-01 - suggested range 0-100 kN) Weight: 27 Kg



C106

E170

Compression device to test mortar prisms 40,1x40x160 mm broken in flexure

STANDARDS: EN 196/1 - ASTM C349 - NF P15-451

To be used with a concrete compression machine foreseen of low capacity measuring range (mod. C097-01) or with a flexural frame.

Dimensions: dia. 140xh 180 mm

Weight: Kg. 12



E170

E171

Compression device to test mortar cube specimens 50 mm (2")

STANDARD: ASTM C109

It is possible to test also cylindrical specimens dia. 50x50 mm.

To be used with a concrete compression machine foreseen of low capacity measuring range (mod. C097-01) or with a flexural frame.

Weight: 12 Kg



E171

E170-01

Compression device to test mortar prisms 40,1x40x160 mm broken in flexure

STANDARD: DIN 1164

Identical to mod. E170, except the platens having 40x62,5 mm size (instead of 40x40 mm) as requested by DIN.



E170-01

E171-01

Compression device to test mortar cube specimens 70,7 mm

STANDARD: BS 4550

It is possible to test also cylindrical specimens dia. 70x70 mm.

To be used with a concrete compression machine foreseen of low capacity measuring range (mod. C097-01) or with a flexural frame.

Weight: 12 Kg



E171-01

Auto-centering device

For cubes 100 and 150 mm side and cylinders dia. 100 and 150 mm. The lower compression platen of the testing machine is marked with a serie of concentric circles to facilitate the correct centering of the specimens. However to grant a rapid and accurate centering of concrete cube and cylinder specimens, this "Auto-Centering" device is recommended.

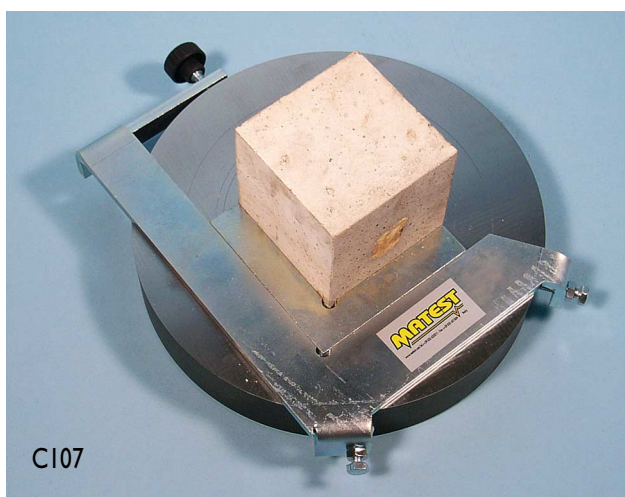
MODELS:

CI07

Auto-Centering Device, to be used with compression machine having platen dia. 216 mm (1500 and 2000 kN)

CI07-01

Auto-Centering Device, to be used with compression machine having platen dia. 287 mm (3000 kN and high stability machines)



CI07

CI04

Bench, used to hold the compression (or flexural) testing frame, to set the machine at a proper height for its utilization.

Alternative solution to a concrete holding base.

Made from heavy welded steel.

When ordering, please specify the model of testing machine the bench is to be designed.

Weight: 55 Kg. approx.



CI04

Safety guards to CEE/89/392 Directive, manufactured from highly resistant transparent polycarbonate material, complete with hinges and lock.

The guards are both on front back and lateral side.

MODELS:

CI21 Safety guards for "four columns" machine

CI21-01 Safety guards for "four columns" machine equipped with large sized platens for blocks

CI21-02 Safety guards for "enbloc frame" machine 2000 kN

CI21-03 Safety guards for "enbloc frame" machine 2000 kN equipped with large sized platens for blocks

CI21-04 Safety guards for the 5000 kN capacity machine



CI21

Packing set, at three elements, for piston/cylinder coupling

MODELS:

CI22 Packing set for compression machine 1200 kN capacity

CI22-01 Packing set for compression machine 1500 kN capacity

CI22-02 Packing set for compression machine 2000 kN capacity

CI22-03 Packing set for compression machine 3000 kN capacity

CI22-04 Packing set for flexure machine 150 kN capacity

CI23 Packing set for the hand-operated pump of testing machines.



CI22 ÷ CI22-04

C114-01



C114



C113

C113

Pumping unit, hand operated, complete with tank, accessories and connectors. Spare part for compression and flexure machines.

Weight: 20 Kg

C114

Pumping unit, motorized, complete with tank, speed selector, hydraulic cock, accessories and connectors.

Spare part for compression and flexure machines.

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

Weight: 40 Kg

C114-01

Pumping unit, motorized, identical to mod. C114, but equipped also of a three way hydraulic valve to activate, alternatively, two testing frames. Supplied complete.

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

C118

Gauge, dia. 250 mm foreseen for max. load pointer, zero adjustment and mirror face. Spare part for compression and flexure machines.

Supplied pre-calibrated with calibration certificate.

When ordering please specify machine type and gauge range.



C118

Pressure transducer

Used in conjunction with the electronic computerized digital display mod. C099, or with the Servo-Unit console mod. C098.

Supplied pre-calibrated with calibration certificate.

Nominal sensitivity: 2 mV/V. Accuracy: $\pm 0,5\%$

AVAILABLE MODELS:

C116-01 Pressure Transducer range: 0 - 10 bar

C116-02 Pressure Transducer range: 0 - 20 bar

C116-03 Pressure Transducer range: 0 - 35 bar

C116-04 Pressure Transducer range: 0 - 50 bar

C116-05 Pressure Transducer range: 0 - 100 bar

C116-06 Pressure Transducer range: 0 - 200 bar

C116-07 Pressure Transducer range: 0 - 350 bar

C116-08 Pressure Transducer range: 0 - 500 bar

C116-09 Pressure Transducer range: 0 - 700 bar



C116÷C116-09





Compression platens

Surface hardened HRC 60 and ground.

MODELS:

- CI10** Upper compression platen dia. 165 mm for 1200 kN machine
- CI10-11** Lower compression platen dia. 165 mm for 1200 kN machine
- CI10-01** Upper compression platen dia. 216 mm for 1500 kN and 2000 kN machine
- CI10-12** Lower compression platen dia. 216 mm for 1500 kN and 2000 kN machine
- CI10-02** Upper compression platen dia. 287 mm for 3000 kN machine
- CI10-13** Lower compression platen dia. 287 mm for 3000 kN machine
- CI10-03** Upper compression platen dia. 287x60 mm complete with ball seating for 2000 kN and 3000 kN high stability machines
- CI10-14** Lower compression platen dia. 287x60 mm for 2000 kN and 3000 kN high stability machines
- CI12** Set of upper and lower compression platens 245x510x55 mm for tests on blocks
- CI12-01** Set of upper and lower compression platens 320x510x76 mm for test on blocks

Distance pieces

Used to reduce the vertical clearance between the compression platens, according to the height of the specimen to be tested, so to avoid the ram to make its max. excursion (approx. 50-55 mm) without having compressed the specimen.

The distance pieces are placed between the ram and the lower compression platen.

MODELS:

- CI11** Distance piece for cubes 150 mm side (Height: H = 176 mm) for 1500 kN and 2000 kN machines
- CI11-01** Distance piece for cubes 100 mm side (H = 50 mm) for 1500 kN and 2000 kN machines
- CI11-02** Distance piece for cubes 100 mm side (H = 226 mm) for 1200 kN machine
- CI11-03** Distance piece for cylinders dia. 100x200 and 110x220 mm (H = 100 mm) for 1200 kN, 1500 kN and 2000 kN machines
- CI11-04** Distance piece for cubes 200 mm side (H = 126 mm) for 2000 kN blocks and 3000 kN machines
- CI11-05** Distance piece for cubes 150 mm side (H = 50 mm) for 2000 kN blocks and 3000 kN machines
- CI11-06** Distance piece for cubes 100 mm side (H = 50 mm) for 2000 kN blocks and 3000 kN machines
- CI11-07** Distance piece for cylinders dia. 100x200 and 110x220 mm (n°2 pieces H = 50 mm) for 2000 kN blocks and 3000 kN machines

- CI11-08** Slotted distance piece for cubes 200 mm side (H = 126 mm) for central screw machines
- CI11-09** Slotted distance piece for cubes 150 mm side (H = 50 mm) for central screw machines
- CI11-10** Slotted distance piece for cubes 100 mm side (H = 50 mm) for central screw machines
- CI11-11** Slotted distance piece for cylinders dia. 100x200 and 110x220 mm (n°2 pieces H = 50 mm) for central screw machines
- CI11-12** Distance piece for cubes 200 mm side (H = 126 mm) for high stability machines
- CI11-13** Distance piece for cubes 150 mm side (H = 50 mm) for high stability machines
- CI11-14** Distance piece for cubes 100 mm side (H = 50 mm) for high stability machines
- CI11-15** Distance piece for cylinders dia. 100x200 and 110x220 mm (n°2 pieces H = 50 mm) for high stability machines
- CI11-16** Distance piece for beams 100x100x400 (500) mm (H = 50 mm) for flexural machines

NOTE: to test cylinders dia. 150x300 mm and 160x320 mm no distance piece is necessary





C094

Portable press 55 kN capacity

Used for compression tests on small cylinder specimens and core samples up to dia. 60x100 mm.

The tester is fitted with two manometers range 5,5 kN div. 0,1 kN and 55 kN div. 1 kN.

The load is applied by a hand pump.

The compression platens have dia. 65 mm., the upper one has a spherical seat and the vertical daylight is 110 mm.

Complete with wooden carrying case.

Dimensions 570x270x550 mm. Weight 30 Kg



C094

ACCESSORY:

A125-01

Set of two hardened conical points, to modify the press mod. C094 into the "Point load tester" (see section aggregates mod. A125), for the rock strength index test.

C095

Flexural testing machine, designed to test: paving slabs, flat blocks, roof tiles, floor tiles, terrazzo tiles, ceramics, bricks, masonry units, etc.

STANDARDS: EN 538, 491 - UNI 9730/3, 2107 - BS 6073/1

The machine consists of steel frame, one upper bearer and two lower adjustable bearers, a mechanical hand-operated screw jack and a 10 kN capacity proving ring to measure the applied load.

- Maximum load capacity: 50 kN (5000 Kg.)
- Proving ring 10 kN capacity, complete with calibration certificate (proving rings with larger capacities up to 50 kN on request - see pag. 246)
- Vertical clearance between the bearers, adjustable from 50 to 300 mm.
- Distance between lower bearers, adjustable from 50 to 500 mm.
- Bearers dimensions: dia. 25x500 mm
- Accuracy: 1% of the applied load
- Dimensions: 710x610x1520 mm
- Weight: 120 Kg



C095

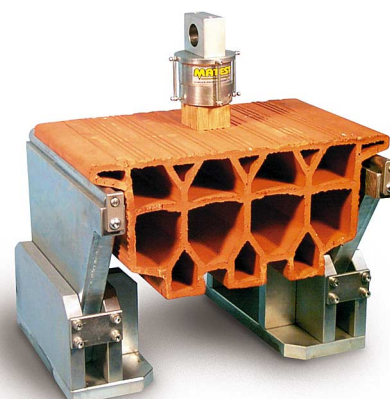
ACCESSORY:

C093-11

DEVICE for flexural tests on clay blocks for flooring

STANDARD: UNI 9730-3

It consists of two lower bearers dia. 20x300 mm and upper square wooden pressure punch.



C093-11



103

C096**Impact failure test on tiles and paving materials**

STANDARD: Art. 3 n° 2234 - 1939

Utilized to verify the quality of paving materials like tiles, ceramics, bricks, floor tiles etc. by the impact method.

The specimen under test is placed on the base of the device which has been previously filled with sand. Then a spherical ball of approx. 1000 gr. is dropped on the tile from a known height, to measure the height under which the specimen will break.

Dimensions: 900x900x1300 mm

Weight: 70 Kg

**Compressometer****Static modulus of elasticity**

STANDARDS: ASTM C469 - UNI 6556

Used to determine the strain and deformation characteristics of concrete specimens. It comprises two steel rings for clamping to the specimen, two gauge length bars, dial gauge divisions 0,001 mm and spherically-seated lever unit.

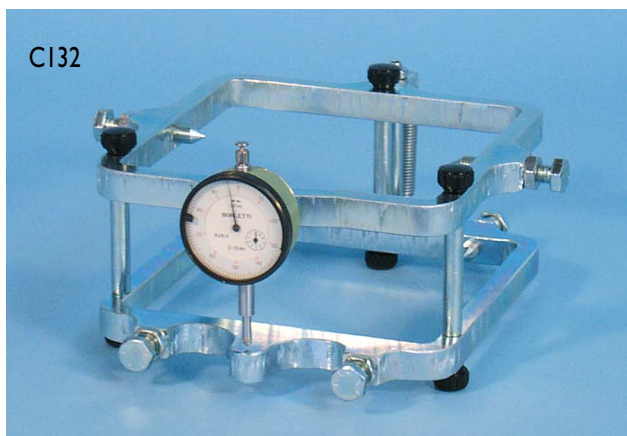
MODELS:

- C130** Compressometer for cylinders dia. 150x300, 160x320 mm. and 6"x12". Dial 0,001 mm sens.
- C131** Compressometer for cylinders dia. 100x200, 110x220 mm and 4"x8". Dial 0,001 mm sens.
- C132** Compressometer for cubes 150x150 mm side. Dial 0,001 mm sens.

C130



C132

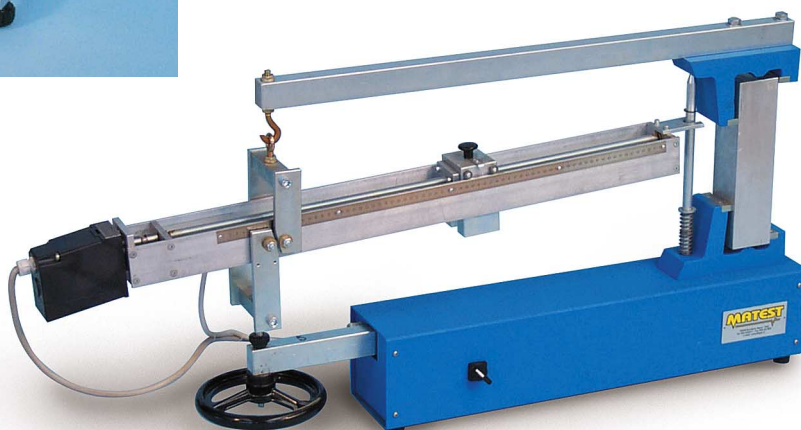
**C135****Simrup apparatus**

Designed to measure the tensile strength of concrete beam specimens size 70x70x280 mm by means of the constant moment bending test method.

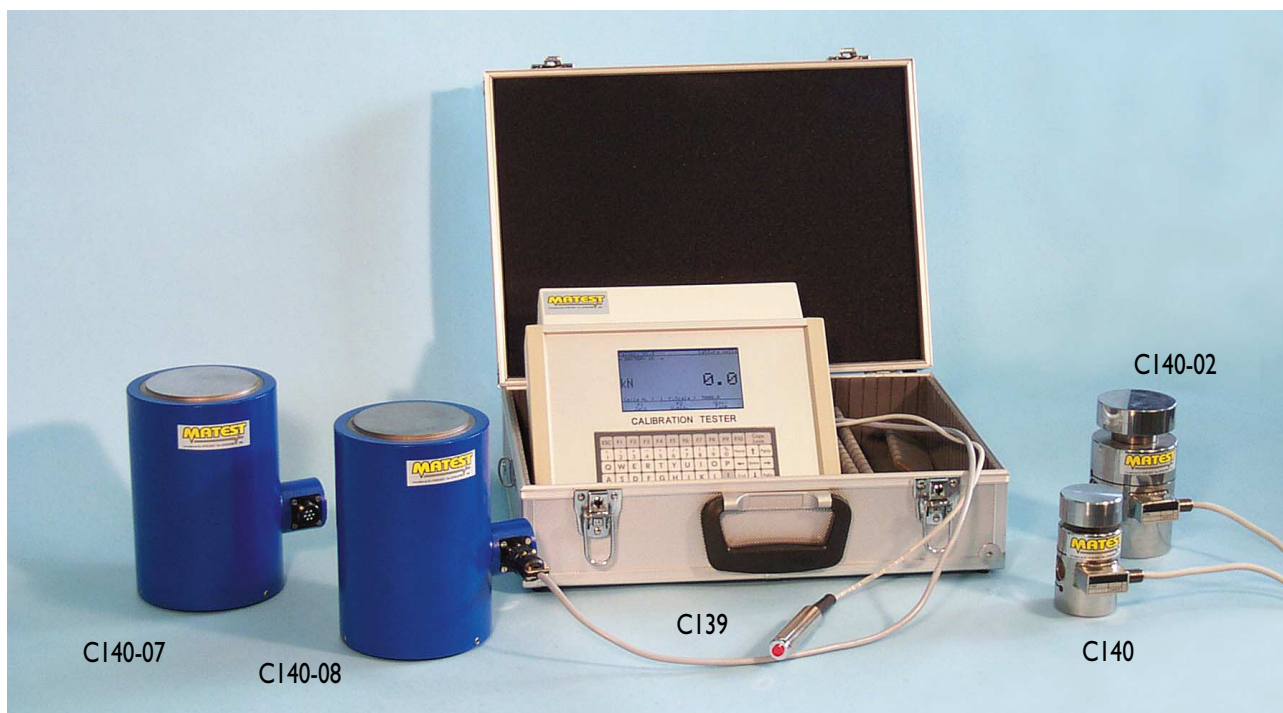
Power supply: 220-240 V 1 ph 50 Hz 100 W

Dimensions: 1050x250x510 mm

Weight: 45 Kg



C135

**CI39****Universal digital measuring tester for load cells**

STANDARDS: EN 12390/4 - UNI 6326 - DIN 51220 - NF P18-411
ASTM E4 - BS 1610

This universal digital computerized instrument with microprocessor is used in conjunction with load cells of different capacity mod. CI40÷CI40-09 to measure their signal so to compare the load measurement with the load read on the machine under test. Possibility to read the measured values in kN or tons. Automatic zeroing of the tare. The instrument foresees 3 memory programs of ten passages each. At the end of the test the unit automatically elaborates the memorized values and displays:

- effective applied load
- measured load (over 3 cycles)
- average measured load
- accuracy in %
- repeatability in %
- relative readability in %
- max error in %

The accuracy of the tester is $\pm 0,5\%$ of the indicated load.

Supplied complete with accessories, carrying case.

Power supply: 220-240 V 1ph 50 Hz

Dimensions: 450x350x160 mm

Weight: 8 Kg

ACCESSORIES FOR MOD. CI39:

CI124-02

PRINTER, A4 format to print the test results, utilized also as calibration certificate.

CI39-01

SOFTWARE "MATCAL"

For data acquisition and processing of calibration values with certificate printing.

Supplied on CD Rom for PC installation

Standard load cells**For calibration of testing machines**

STANDARDS: EN 10002/3 - ASTM E74

These load cells are suitable for the calibration of compression testing machines. They consist of a high quality steel block, named sensitive element, where some strains have been fitted: the whole is housed in a sheathing. While the load is applied, strains are transmitted to an amplifier (mod CI39) which gives a load digital reading. Further advantages of these cells are thermal stability during the time, possibility to equip different load cells on the same measuring tester and therefore to check all load capacities.

Supplied complete with calibration certificate.

TECHNICAL SPECIFICATIONS

- Full scale nominal output 2 mV/V
- Hysteresis (non linearity) $\pm 0,1\%$
- Repeatability: 0,03%
- Uncertainty: 0,25%

Models	Capacity kN	Dimensions dia. x height mm.
CI40	25	82x59
CI40-01	50	82x59
CI40-02	75	82x59
CI40-03	100	82x59
CI40-04	300	135x200
CI40-05	600	135x200
CI40-06	1000	135x200
CI40-07	2000	135x200
CI40-08	3000	135x200
CI40-09	5000	180x200



27/04/2001

CALIBRATION CERTIFICATE

UNI 6886/2

Indicator

Name : MVD 2530A
Tested on : 05/01/2001

Reference

Name : C/PA AXG
Tested on : 05/01/2001
Unit : kN
Scale : 3000

Equipment

Name : C 089/17
Date : 21/04/2001
Serial n° : 1ord.Exp.5.355
Temperature : 19°C

Increment : 0.2
Oscillation : 0.2
Resolution : 0.2

n°	F ₁	F ₁ '	F ₂ '	F ₃ '	F̄	q %	b %	a %	q % MAX
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	600.00	600.13	600.13	600.46	600.24	-0.04	0.05	0.03	-0.08
2	1200.00	1199.97	1199.85	1199.91	1199.91	0.01	0.01	0.02	0.01
3	1800.00	1800.28	1800.04	1800.07	1800.13	-0.01	0.01	0.01	-0.02
4	2400.00	2400.16	2400.73	2400.94	2400.61	-0.03	0.03	0.01	-0.04
5	3000.00	3001.15	3001.87	3002.11	3001.71	-0.06	0.03	0.01	-0.07

Notes :

transductor n.01130370

Paso	kN	Pts	Paso	kN	Pts
00	0	0	06	1800	8205
01	300	1371	07	2100	9572
02	600	2737	08	2400	10936
03	900	4103	09	2700	12300
04	1200	5471	10	3000	13662
05	1500	6839			

Operator : _____

Responsible : _____

CERTIFICATE EXAMPLE WITH CI39-01 SOFTWARE

CI41

Universal digital indicator

This unit for professional uses, is proposed as an alternative to mod. CI39, and is recommended to Metrologic Laboratories, SIT centres, and it has to be used with the High Performance Strain Load Cells mod. CI42÷CI42-07. The input section is realized with a chain of:

- an analog circuit (with high precision and high long term stability)
- a frequency generator to supply the electric load cells
- an A/D converter with resolution ± 200.000 divisions.

Supplied complete with serial output RS 232C and 24 columns printer output. Power supply: 220-240V 1 ph 50/60 Hz
Dimensions: 125x210x204 mm. Weight: 3 Kg

ACCESSORY:

CI41-01 Printer, 24 columns type

Strain load cells "high performance" For calibration of testing machines

STANDARDS: EN 10002-3 - ASTM E74

These electrical strain gauge load cells of high accuracy and stability, are proposed as an alternative to the standard load cells, for verification and calibrations of high precision, repeatability, and are recommended for a professional use, Metrologic Laboratories, SIT centres.

To be used with the Digital Indicator mod. CI41.

Each cell is supplied complete with calibration certificate.

section C



105

Models	Capacity kN	Dimensions dia. x height mm.
CI42	30	100x127
CI42-01	100	105x164
CI42-02	300	140x160
CI42-03	600	140x170
CI42-04	1000	150x180
CI42-05	2000	135x200
CI42-06	3000	135x200
CI42-07	5000	158x258



CI42 ÷ CI42-07

CI41



Compression load frames stability verification tester (Footemeter test)

STANDARDS: EN 12390/4 - UNI 6686/3 - BS 1881:115
DIN 51302

The equipment to carry out this test is composed by:

C154

Electric strain load cell 3000 kN capacity

Consisting of a strain steel cylinder where four balanced strain gauge bridges are centered to measure the deformation on 4 generatrix in relation with two diameters, orthogonal between them, so that both axial and circumferential deformations can be measured.

The cell incorporates a fifth strain gauge utilized for load measurement calibration tests.

Supplied complete with connectors, cables, calibration certificate.

Dimensions: dia. 140 by 200 mm high

Weight: 18 Kg

C154-01

Positioning device, manufactured with special steel, hardened and rectified.

It allows to correctly position the load cell on the lower platen of the compression frame, to carry out the footemeter test as described by the Standards.

C155

Digital measuring tester with microprocessor

This unit reads simultaneously the four values supplied by the electric strain load cell. The values are memorized, automatically elaborated, visualized and printed (by optional printer), to directly supply the various coefficients resulting by the calculations.

The unit, through the wide display, shows to the utilizer the different test procedures, as requested by previously selected specification (BS, EN, DIN, UNI).

At the end of the test, the display automatically visualizes the test results, by informing also if the frame under test is conforming to the requirements of the selected specification as regards the stability (axial transmission of the loads, self-alignment of the seat ball etc.).

The digital readout unit is also foreseen of a fifth digital reading channel allowing to carry out load calibration tests on compression machines up to 3000 kN capacity. Supplied complete with accessories, carrying case.

Power supply:
220-240 V 1ph 50 Hz

Dimensions:
450x350x160 mm

Weight: 8 Kg

ACCESSORY:

C124-02

PRINTER, A4 format to automatically print the test results, utilized also as on official stability certificate.

VERIFICATION following BS 1881

Machine Type	C 089/17	Footemeter	C155 Matest
Serial No.	1 ord.Exp.5.355	Verified on	05/01/01
Place / date	Brembate Sp. 10/04/01	Load cell	C/PA 3000 kN
Resolution	0.2 Class 1	Verified on	09/02/01
Range from	0 to 2000 kN	Temperature	21.0 C

UPPER PLATE SELF-ALIGNMENT CHECK

Load 200 kN

Lean	e1	R1	e2	R2	e3	R3	e4	R4	avg
A	0.172	-0.078	0.200	0.071	0.185	-0.012	0.190	0.018	0.187
C	0.186	-0.008	0.188	0.003	0.188	0.004	0.188	0.001	0.187
B	0.173	-0.070	0.198	0.065	0.181	-0.031	0.193	0.036	0.186
D	0.181	-0.031	0.191	0.025	0.195	0.045	0.179	-0.039	0.187
Max-Min	0.0699 Ok		0.0683 Ok		0.0758 Ok		0.0752 Ok		
Avg. R	-0.0464 Ok		0.0408 Ok		0.0014 Ok		0.0042 Ok		

SELF-LOCKING CHECK

Load 200 kN

Pos.	e1	R1	e2	R2	e3	R3	e4	R4	avg	
A	0.138	-0.261	0.235	0.259	0.187	---	0.188	---	0.187	
C	0.241	0.289	0.133	-0.290	0.189	---	0.185	---	0.187	
B	0.175	---	0.190	---	0.143	-0.225	0.232	0.256	0.185	
D	0.188	---	0.184	---	0.237	0.270	0.138	-0.261	0.187	
dAC	0.046 Ok		dBD 0.042 Ok							

SELF-LOCKING CHECK

Load 2000 kN

Pos.	e1	R1	e2	R2	e3	R3	e4	R4	avg	
A	1.550	-0.170	2.182	0.168	1.903	---	1.837	---	1.868	
C	2.170	0.162	1.564	-0.163	1.887	---	1.850	---	1.868	
B	1.864	---	1.860	---	1.612	-0.136	2.127	0.140	1.866	
D	1.861	---	1.872	---	2.145	0.148	1.595	-0.146	1.868	
dAC	0.028 Ok		dBD 0.024 Ok							

CERTIFICATE EXAMPLE





C160

Drum type mixer

Suitable for field mixes of medium strength concrete.

Drum volume: 140 litres

Yield: 90 litres of concrete

Power supply: 220-240V 1ph 50 Hz - 0,3 HP

Dimensions: 720x1320x1280 mm

Weight: 84 Kg



C161

Drum type mixer, same as mod. C160 but having:

Drum volume 100 litres

Yield: 65 litres of concrete

Weight: 60 Kg

C162

Pan type mixer 56 litres capacity

This multiflow mixer absorbs fewer air during mixing, requires shorter mixing time and grants a perfect homogeneity in mixtures having a low water cement ratio.

The pan is easily removable by means of a trolley (accessory).

The blades are hardened against wear.

Mixing pan: 640 mm. dia. x 330 mm deep

Power supply: 220-240V 1ph 50 Hz 2 Hp

Weight: 250 Kg

ACCESSORIES:

C162-01

TROLLEY for fast and easy removal of the mixing pan of the multi-flow mixer

C162-02

Safety guards to 89/392/CEE Directives.

C163

Pan type mixer 130 litres capacity

Pan volume of 200 litres with a mixing capacity of 130 litres of concrete.

It is provided of an opening at the bottom for the outcoming of the mixed concrete.

The mixing paddles and blades are made of special resistant steel.

Power supply: 400V 3ph 50 Hz - 5 Hp

Weight: 250 Kg



C164

Pan type mixer 220 litres capacity

Basically similar to mod. C163, but having:

Pan volume 300 litres. Mixing capacity: 220 litres of concrete

Power supply: 400V 3ph 50 Hz 7 Hp

Weight: 420 Kg

C165

Pan type mixer 100 litres capacity

Basically similar to mod. C163, but having:

Pan volume: 140 litres

Mixing capacity: 100 litres of concrete

Power supply: 220-240V 1ph 50 Hz 2 Hp

Weight: 130 Kg



SLUMP CONE TEST

STANDARDS: EN 12350/2 - BS 1881:102 - AASHTO T119
ASTM C143 - NF P18-305, P18-451
UNI 7163, 9418 - UNE 7103, 83313

For the determination of the consistency, the medium and high workability of fresh concrete.

C180

SLUMP CONE COMPLETE SET including: stainless steel cone, metal pan, tamping rod, slump scale with measuring device, cone funnel, all completely protected against corrosion, aluminium scoop. Weight: 10 Kg



C180

C182

SLUMP CONE SET, including: galvanized slump cone, base plate, tamping rod, aluminium scoop, steel rule 500 mm long.



C182

C183

Vebe' consistometer

STANDARDS: EN 12350/3 - BS 1881:104 - UNI 9419

The Vebe' consistometer method is based on the same principle of the simple slump cone test method, for the determination of the workability of concrete, but it has the advantage of a mechanized action. After removing the slump cone, the concrete undergoes a vibration to determine its slump. A spacer disk, set in contact with the upper surface of the wet concrete, gives the operator the opportunity to determine when the compaction is complete. The operator will count the time necessary to complete the requested vibration, so as to get an indication of the workability of the concrete.

Power supply: 220-240 V 1ph 50 Hz 250 W

Dimensions: 260x380x700 mm. Weight: 90 Kg



C183

SPARE PARTS:

- C180-01** Slump cone only, stainless steel
- C180-02** Tamping rod, galvanized dia. 16x600 mm
- C180-03** Cone funnel, galvanized
- C180-04** Base plate for C182 set
- V176-02** Steel rule 500 mm long
- V183** Aluminium scoop
- C181** Slump cone only, galvanized steel

V185-03

Scoop, stainless steel

STANDARDS: EN 12350/1 - UNI 9416 - BS 1881:101

Used to sample fresh concrete

Capacity: 5 Kg of concrete

Dimensions: dia. 125x250 mm



V185-03





C185 Compacting factor apparatus

STANDARDS: BS 1881:103
BS 5075

Designed to undertake a more precise and sensitive test procedure than the simple slump test.

The apparatus consists of two conical hoppers mounted on a cylinder. Each hopper has a hinged flange with quick release mechanism and everything is mounted on a rigid steel stand.

To execute the test, place the concrete into the upper hopper. When filled, open the trap door so that the concrete falls into the lower hopper. Now open the trap door of the second hopper so that the concrete falls into the cylinder. Cut off the excess of concrete remained on top of the upper hopper using a trowel and determine the weight of the partially compacted concrete and the weight of the fully compacted concrete. Supplied complete with tamping rod dia. mm 16x600 long.
Dimensions: mm 500x400x1510. Weight: 55 Kg



C185

C192 Flow table

STANDARDS: EN 12350/5 - BS 1881:105 - DIN 1048 - UNI 8020

The apparatus comprises a galvanized steel conical mould, dia. 130/200 xh 200 mm, double wooden flow table with galvanized steel top plane, guide device, wooden tamper.

Used to determine the workability of concrete. The top table has a square surface of 700x700 mm, hinged on one side. Weight: 30 Kg

SPARES:

C192-01 Conical mould, galvanized steel made,
dia. 130/200 xh 200 mm

C192-02 Wooden tamper



C192

C187 K-slump tester

STANDARD: ASTM C1362

To determine the degree of compaction and the workability of fresh concrete. Used for in-situ measurements or inside test moulds. Test results can be correlated against the slump values.
Weight: 500 g



C187

C188

C188 Walz consistometer

STANDARDS: EN 12350/4 - DIN 1048 - UNI 9420

To measure the consistency of fresh concrete.

It consists of a metal box with handles 200x200 mm by height 400 mm, painted for rust protection.

Weight: 6 Kg

C186 Kelly ball apparatus

STANDARD: ASTM C360

Consisting of a hemispherically ended cylinder with guiding frame and a handle graduated in inch and mm, it is used to determine the workability of fresh concrete. The ball is lowered into the concrete and the penetration measured.

It can be used on site or in laboratory.

Cadmium plated for rust protection.

Weight: 15 Kg



C186

C189

Concrete workability meter

STANDARD: NF P18-452

The concrete workability meter (also known as plastometer) is designed to test concrete for dynamic workability.

It is suitable for field and laboratory tests to check:

- concrete mix for consistency, especially water content
- optimum proportioning of concrete constituents (sand, gravel, water, cement)
- possible improvement when admixing a plastifier
- comparing two concrete types

The unit consists of a prismatic receiver divided into two unequal volumes by a removable partition, and an electric vibrator.

The fresh concrete is poured into the large volume space, the separating partition is removed, and the vibrator starts automatically.

The test consists in measuring the time required for the concrete to reach a uniform distribution in the receivers

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

Dimensions: 820x420x410 mm

Weight: 80 Kg



C189

C190

Plasticity meter

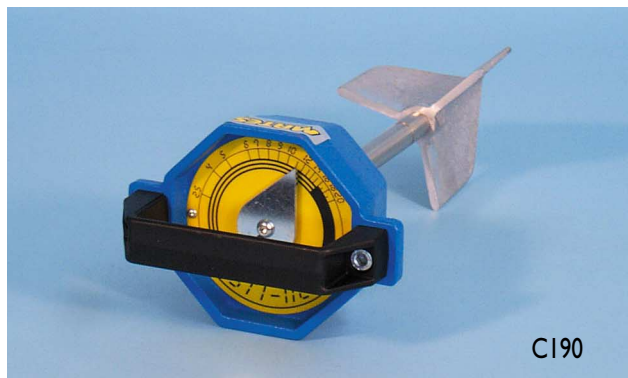
Used for quick and easy measurements of the plasticity of mixtures, especially concrete, and so to detect rapidly any excess of water.

The measuring system is related to the shear strength applied by a three blade head to the mixture under test.

It is possible to measure the plasticity at several different points, and directly in the mixture, with multiple checking, and obtained values can be easily compared with the values got by the slump Abrams cone test.

Dimensions: dia. 130x180 mm

Weight: 2 Kg



C190

C194

Concrete pocket penetrometer

STANDARDS: UNI 7123 - ASTM C403 - AASHTO T197

Used for the evaluation of the initial set of the concrete mortar:

The penetration plunger has a tip area of 32 sq/mm. It is plunged into the mortar to a depth of 25,4 mm. indicated on the plunger.

The resistance expressed in Kpa and Lbf/sq.in. is shown on the marked direct-reading scale.

Dimensions: dia. 25x210 mm

Weight 400 g



C194

C213

Concrete penetrometer

STANDARDS: ASTM C 403 - AASHTO T197 - UNI 7123, 7927

Used to determine the setting time of the mortar fraction in concrete mixes with slump greater than zero, by testing mortar sieved from mix. The apparatus consists of a spring penetrometer (capacity 100 Kgf, precision 1 Kgf) and six interchangeable stainless steel needle pointers of 16-32-65-160-325-650 mm² area. A sliding ring indicates the reached load on the handle of the penetrometer. Supplied complete with carrying case.

Dimensions: 450x160x70 mm. Weight: 5 Kg



C213



C195

Air entrainment meter 5 litres capacity

STANDARDS: EN 12350/7 - BS 1881:106 - UNI 6395

ASTM C231 type A - NF P18-353 - UNE 7141

Made from cast aluminium alloy. It records directly the percentage of air enclosed in freshly mixed concrete by operating according to the air pressure principle.

The instrument is supplied complete with pressure gauge tamping rod and hand pump.

Air content range 0÷8% - div. 0,1%

Dimensions: dia. 250x700 mm. Weight: 13 Kg

ACCESSORIES:

C195-01 Calibration cylinder to check and calibrate the air meter mod. C195

C195-02 Wooden carrying case, complete with handles, for the air meter mod. C195



Density of hardened concrete

STANDARDS:

EN 12390/7 - UNI 6394/2

BS 812, 1881:114

SPECIFIC GRAVITY

FRAME, mod. V084

See Section "V" pag. 253)



C196

Air entrainment meter 8 litres capacity

STANDARD: DIN 1048 - ASTM C231 type B

It consists of an aluminium vessel with built in hand operated pressure pump, connected to the measuring gauge showing directly the air content in percentage.

Air content range: 0÷10%

div. 0,1% up to 8% and 0,5% over

Dimensions:

dia. 250x450 mm

Weight: 12 Kg



C197

Air entrainment meter 8 litres capacity

STANDARD: DIN 1048 - ASTM C231 type B

Identical to mod. C196 but with built in automatic electric air compressor giving air pressure, and keeping it constant all along the test.

Power supply: 220-240V 1ph 50 Hz

Dimensions: dia. mm. 250x450

Weight: 14 Kg



ACCESSORY:

C197-01

Filling hopper for the air entrainment meters C196 and C197



C199 Unit weight measure, 10 litres capacity

STANDARDS: EN 12350/6
BS 1881:107 - EN 1097/3

Used to determine the weight per cubic metre of freshly mixed and compacted concrete.

Made from steel, 4 mm thick, protected against corrosion, with inside radius between wall and base of 20 mm, with machined rim and base.

Inside diameter 200 by height 320 mm

Weight 9 Kg



C199

Unit weight measures

STANDARDS: ASTM C29, C138 - AASHTO T19 - UNI 6394
UNE 7286 - BS 812, 1881 - EN 1097/3

Made from heavy steel sheet, protected against corrosion, they are used to determine the weight per cubic metre of freshly mixed and compacted concrete, and as per ASTM Standards also the air content of fresh concrete.

Used also for the determination of loose bulk density and voids of aggregates.

C200 ÷ C205-01



Models	Capacity Litres	Inside diameter mm	Useful height mm	Sheet thick mm	Weight Kg
C200	1	108,3	108,6	3	2
C201	2	108,3	217,1	3	3
C201-01	3	160	149,2	3	3,5
C202	5	187,7	180,7	3	4
C202-01	7	187,7	253	3	5
C203	10	265	181,3	4	7
C204	14	265	253,8	4	9
C204-01	15	265	272	4	12
C205	28	345,6	298,5	5	14
C205-01	30	345,6	319,8	5	15

C211 Joisel apparatus

Diameter 140x220 mm high.

STANDARD: French LCPC method

Used to separate the various elements of the fresh concrete such as cement, sand, aggregates. All made from stainless steel.

Weight: 2 Kg



C211

C220 Water test set for concrete mixing

STANDARDS: DIN 4030 - EN 206, 1008

This kit, utilized to test the water mixing concrete, is composed by different dropping bottles, water-proof colors scales, test strips. It is suitable, to carry out more than 50 analysis of: total or momentaneous pH, magnesium, ammonium, chloride, odour, sulphate, lime dissolving CO₂, carbonate hardness, total hardness.

Contained in carrying case.

Weight: 2 Kg



C220

CONCRETE FLOW TABLE

STANDARDS: AASHTO T 120 - ASTM C 124 - UNI 8020/A - UNE 7102

Used to determine the flow of concrete. The apparatus consists of a flow table, stainless steel flow mould, tamping bar.



C208



C209

MODELS:

C208

FLOW TABLE, to ASTM, AASHTO, UNE Standards

Hand-operated by crank handle.

Table diameter 762 mm. Weight: 100 Kg

C209

FLOW TABLE, to ASTM, AASHTO, UNE Standards

Motorised, complete with automatic digital drops-counter.

Table diameter 762 mm

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

Weight: 115 Kg

C210

FLOW TABLE, to UNI 8020 Standards.

Hand operated by crank handle.

Table diameter 750 mm. Weight: 100 Kg

C210-01

FLOW TABLE, to UNI 8020 Standard.

Motorized, complete with automatic digital drops-counter.

Table diameter 750 mm

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

Weight: 115 Kg

ACCESSORY:

C210-02

Flow mould, cast bronze made to UNI 8020.

C215

RAM - rapid analysis machine

STANDARD: BS 1881:128

Used for the determination of cement content in fresh concrete, coarse and fine aggregate, fly ash and GGBF slag content can also be determined. Fully automatic procedure with quick and accurate test results (max. errors within 5 Kg./cubicmetre).

The complete test takes approx. 10 minutes. The connection to water net for approx. 80 litres each test is required. The weight of the test sample is 8 Kg.

Supplied complete.

Power supply: 220-240 V 1ph 50 Hz

Dimensions: 780x660x1500 mm

Weight: 150 Kg



C215



PLASTIC CUBE AND CYLINDER MOULDS

These one-piece moulds, made from hard plastic, strong, light, underformable; resistant to vibration shocks and wear, do not require mounting and dismounting operations, thus saving time and labour.

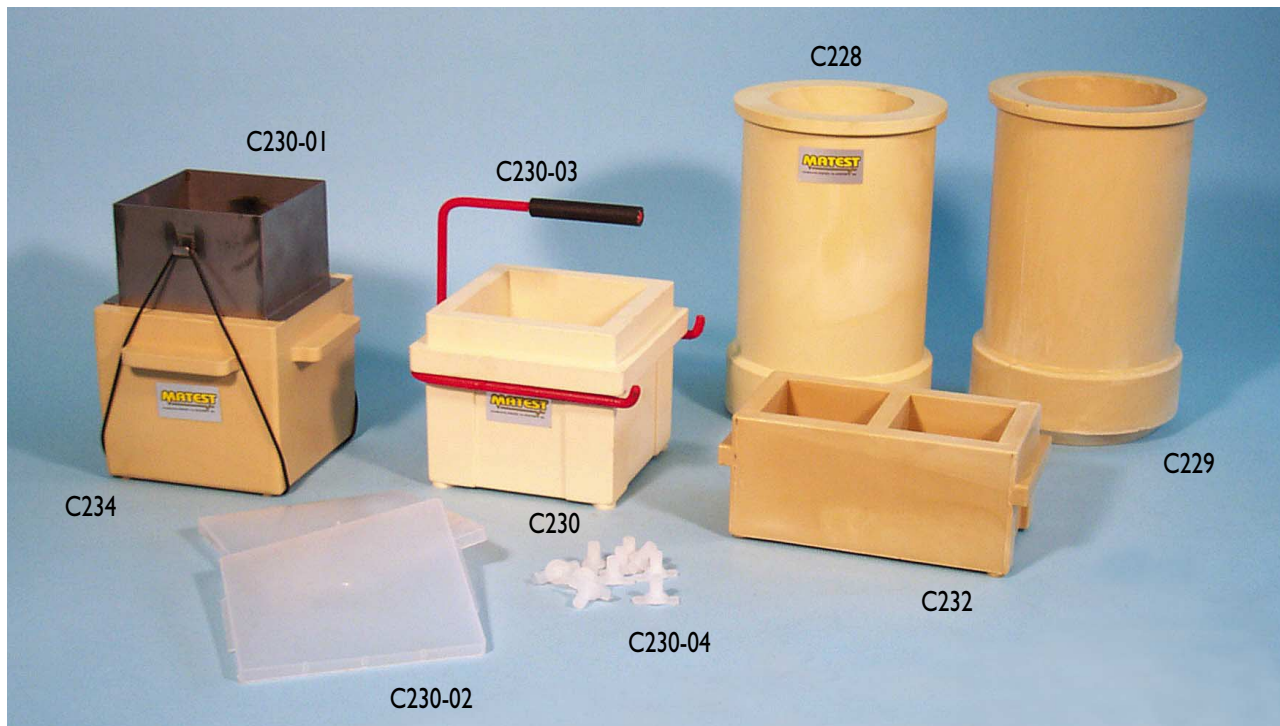
The specimen is expelled from the mould by compressed air or water. They just require a simple clean and demould oiling before being ready for use again for many times.

Nominal moulds dimensions meet to EN 12390/1 Standard requirements.

section C



114



MODELS:

- C228** Cylinder mould dia. 150x300 mm. Weight 2560 g
- C229** Cylinder mould dia. 160x320 mm. Weight 2560 g
- C232** Cube mould 100 mm. side, "two gangs"
Weight 1040 g
- C234** Cube mould 150 mm side, standard model
Weight 1300 g
- C230** Cube mould 150 mm. side with reinforced corners
Weight 1500 g
- C233** Cube mould 150 mm side, "high density" similar to mod. C230, but obtained from more dense and compact plastic material, and therefore more resistant to blows and to abrasion, so to grant low wear and longer life. Weight: 2000 g

ACCESSORIES:

- C230-01** Funnel (filling hopper) for an easier filling of fresh concrete into the plastic cube mould 150 mm. side mod. C230, C233, C234. Stainless steel sheet made.
- C230-02** Plastic cover, for mod. C230, C233 cube mould, useful for transportation. Pack of 10 pcs.
- C230-03** Grasping pliers for mod. C230, C233, C234 to get easier the carriage
- C230-04** Plastic stopper to plug the hole of the mould. Pack of 10 pcs.

POLYSTYRENE CUBE MOULDS

This cube mould, polystyrene made, is utilized for only one test, because it must be broken when the specimen is demoulded.

It gives different advantages:

- it is provided of a top cover keeping inside heat and humidity constant and acting as a curing room
- it protects the specimen as a packing during transport of the same
- it is extremely light
- any trouble concerning the cleaning, demoulding and maintenance of the mould are eliminated.

- C231** Polystyrene cube mould, 150 mm side, one gang. Pack of 40 pieces.
- C231-01** Polystyrene cube mould, 200 mm side, one gang. Pack of 20 pieces.
- C231-02** Polystyrene cube mould, 100 mm side, four gang. Pack of 52 pieces.





STEEL CUBE, CYLINDER AND BEAM MOULDS

Nominal moulds dimensions meet to requirements of

STANDARDS: EN 12390/1 - BS 1881:108, 109, 110 - ASTM C192, C31 - AASHTO T23 - NF P18-400 - DIN 51229 - UNI 6130 - UNE 7240



Steel cube and beam moulds

These models of steel cube and beams moulds are extremely sturdy and the inside surfaces are accurately machined.

MODELS:

- C247** Cube mould, 100 mm. side, one gang. Weight: 6 Kg
C247-01 Cube mould, 150 mm. side, one gang. Weight: 13 Kg
C247-02 Cube mould, 200 mm. side, one gang. Weight: 25 Kg
C247-03 Cube mould, 300 mm. side, one gang. Weight: 90 Kg
C248 Cube mould, 100 mm. side, two gang. Weight: 11 Kg
C248-01 Cube mould, 150 mm. side, two gang. Weight: 30 Kg
C248-02 Cube mould, 200 mm. side, two gang. Weight: 53 Kg
C248-03 Cube mould, 100 mm. side, three gang. Weight: 17 Kg
C248-04 Cube mould, 140 mm. side, three gang. Weight: 30 Kg
C249 Cube mould, 100 mm. side, four gang. Weight: 20 Kg
C249-01 Cube mould, 150 mm. side, four gang. Weight: 45 Kg

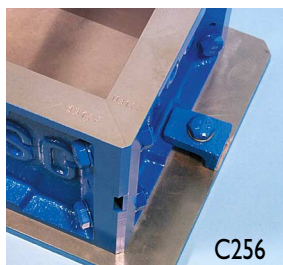
- C254** Beam mould 100x100x400 mm. Weight: 20 Kg
C254-01 Beam mould 100x100x500 mm. Weight: 23 Kg
C254-02 Beam mould 150x150x600 mm. Weight: 44 Kg
C254-03 Beam mould 150x150x750 mm. Weight: 47 Kg
C254-04 Beam mould 200x200x800 mm. Weight: 86 Kg
C254-05 Beam mould 140x140x560 mm. Weight: 38 Kg

C255

Cast iron 150 mm side cube mould, one gang

STANDARDS: EN 12390-1 - BS 1881:108 - DIN 51229 - UNI 6127

Four part design plus baseplate, this mould has nominal dimensions as requested by Standards. Weight: 17 Kg



C256



C255

C256

Cast iron 150 mm side cube mould, one gang

STANDARDS: EN 12390-1 - BS 1881:108 - DIN 51229 - UNI 6127

Four part design plus baseplate, this mould has been checked in shape, dimensions and tolerances with SIT (NAMAS or equivalent) certified measuring instruments.

Each mould is numbered for identification and supplied with Certificate of Conformity to above Standards. Weight: 17 Kg

C230-01

Funnel (filling hopper) for an easier filling of fresh concrete into the cube moulds C247-01, C255, C256. Stainless steel sheet made.

Steel cylinder moulds

The internal finishing is accurately machined. Supplied complete with base.

Models	Dimensions Ø x height	Weight Kg
C258	100x200 mm	8
C258-01	112,8x220 mm	8
C258-02	150x300 mm	15
C258-03	6" x 12"	15
C258-04	160x320 mm	17
C258-05	250x500 mm	80
C258-06	150x150 mm	10

ACCESSORIES:

- C180-02** Tamping rod, 16 mm dia. x 610 mm. long.
C261 Tamping bar, 25 mm. square tamping area x 380 mm long.
C262 Straight edge, 460 mm long.
V178-01 Wire brush, used to clean moulds.
C265 Demoulding oil. Can of 30 Kg

POKER VIBRATORS

STANDARDS: EN 12390-2 - BS 1881:108 - UNI 6137

Suitable for the internal compaction of concrete specimens both in laboratory and in site.

The diameter of the needle must not exceed the 25% of the smallest dimension of the specimen.

MODELS:

C271

POKER VIBRATOR, portable, petrol operated 0,75 HP

Tip dimensions: 25 mm dia. x 250 mm long

Flexible shaft 2 metres long

Frequency: 12000 vibrations/min.

Dimensions: 300x300x400 mm

Weight: 9 Kg approx.



C271

C273

POKER VIBRATOR, portable, electric

Tip dimensions: 25 mm dia. x 250 mm long

Flexible shaft 2 metres long

Frequency: 12000 vibrations/min.

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

Dimensions: 200x300x350 mm

Weight: 7 Kg approx.



C273

C274

POKER VIBRATOR, portable, 12 V DC battery operated

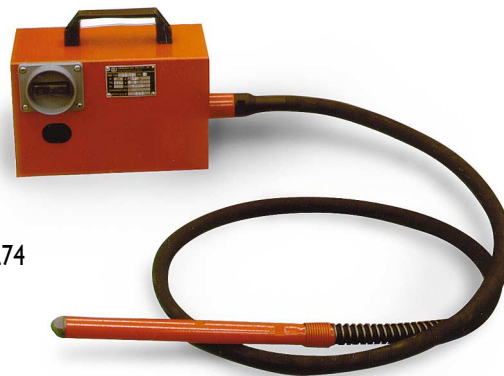
Complete with connector for car lighter.

Tip dimensions: 25 mm dia. x 250 mm long

Flexible shaft 2 metres long

Frequency: 12000 vibrations/min.

Weight: 10 Kg approx.



C274

C275

POKER VIBRATOR, portable, electric.

The tip is directly connected to the motor shaft.

Tip dimensions: 25 mm dia. x 250 mm long.

Frequency: 18000 vibrations/min.

Power supply: 220-240 V 1ph 50 Hz

Weight : 4 Kg approx.



C275

C276

POKER VIBRATOR, portable, pneumatic.

To be connected to an air compressor having minimum feeding of 25 litre-air-min at 6 atm.

Tip dimensions: 25 mm dia. x 250 mm long.

Frequency: 3000 vibrations/min.

Weight: 3 Kg approx.



C276



VIBRATING TABLES

STANDARDS: EN 12390/1 - BS 1881:108 - UNI 6127

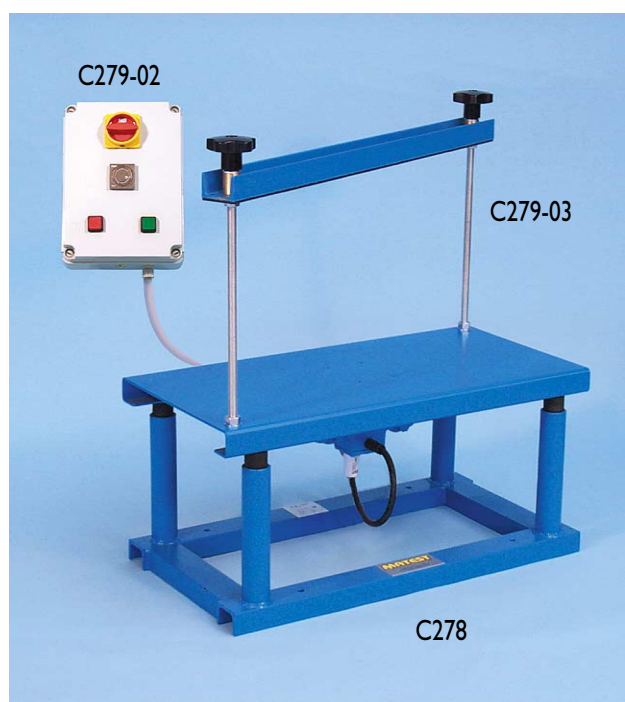
Used for the compaction of concrete specimens in laboratory, they are manufactured from rugged steel sheet.

Equipped with motor-vibrator having 3000 vibrations-minute, it is possible to vary the vibration intensity by acting on the excentric masses.

The height of the table is 410 mm.

Power supply: 220-240V 1ph 50 Hz

Models	Table dimensions	Weight Kg
C278	600x400 mm	60
C278-01	800x400 mm	85
C278-02	800x800 mm	115
C279	1100x550 mm	145



section C



117

C278-02



ACCESSORIES:

C279-01

Additional motor-vibrator (only for C279 model) so as to obtain an unidirectional vibration and a vibrating power of 300 Kg of mass.

C279-02

Separate control panel, complete with On/Off switch and timer.

C279-03

Clamping device to fix the moulds to the table.

C279-04

Pedal switch, water tight.

C280

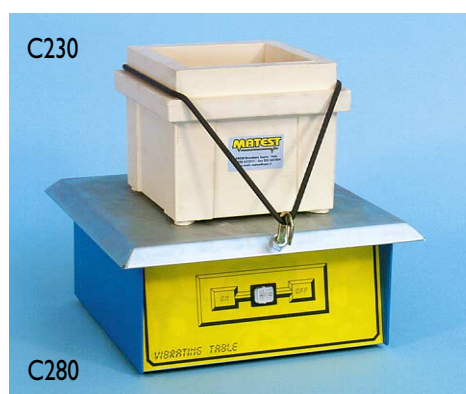
VIBRATING TABLE, expressly manufactured to compact the plastic cube moulds 150 mm mod. C230, C233, C234 and also steel cube moulds 150 mm one gang mod. C255, C256, C247-01

Complete with On/Off switch.

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

Dimensions: 320x320x300 mm

Weight: 20 Kg



C279

CYLINDER CAPPING EQUIPMENT

Sulphur method

STANDARDS: EN 12390/3 - ASTM C617, C31, C192 - AASHTO T23, T126 - NF P18-416 - UNI 6132 - UNE 7240, 83303

The above mentioned Specifications require that the two faces of the concrete core or cylinder specimen must be made perfectly flat and parallel, by using sulphur capping equipment.

section C

C290



The equipment is composed by:

- Vertical cylinder capper to obtain plane end surfaces perpendicular to the axis of the cylinder
- Cylinder carrier for an easier handling of the specimens
- Electric pot, to melt the capping compound, capacity 3 litres, complete with thermostat.
Power supply: 220-240 V 50/60 Hz 1 ph 1200 W
- Capping compound of sulphur and mineral mixture, with minimum strength of 55 MPa. Pack of 25 Kg
- Stainless steel ladle
- Weight: 50 Kg

MODELS:

- C290** Capping set for cylinders dia. 150x300 mm and 6"x12"
- C291** Capping set for cylinders dia. 160x320 mm
- C292** Capping set for cylinders dia. 100x200 mm
- C293** Capping set for cylinders dia. 112,8x220 mm

SPARES:

- C290-01** Vertical cylinder capper for dia. 150x300 mm and 6"x12"
- C291-01** Vertical cylinder capper for dia. 160x320 mm
- C292-01** Vertical cylinder capper for dia. 100x200 mm
- C293-01** Vertical cylinder capper for dia. 112,8x220 mm

C290-03 Electric melting pot, 3 litres capacity.
220-240V 1ph 50-60 Hz 1200W

C290-05 Capping compound, pack of 25 kg.

V186-01 Stainless steel ladle

OTHER MODELS:

C294-01 Vertical cylinder capper for dia. 250x500 mm

C294-02 Cylinder carrier for dia. 250x500 mm

C294-05 Vertical cylinder capper
for dia. 60x120 mm

C294-05



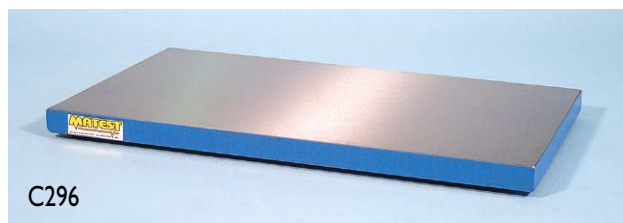
C296

Steel capping plate, used for capping concrete blocks up to 500x300 mm

The plate surface is accurately machined.

Dimensions: 500x300x20 mm

Weight: 30 Kg



C296



**C300****SPECIMEN GRINDING MACHINE**

STANDARDS: EN 12390/3 - UNI 6132

Designed to grind and polish cubic and cylindrical specimens of concrete, rocks, natural stones etc. having 370 mm. as max height. This machine can grind at a time:

- 3 cube specimens 100 mm. side, or
- 2 cube specimens 150 mm. side, or
- 2 cube specimens 200 mm. side, or
- 2 cylinder specimens dia. 100x200 mm, 110x220 mm, 150x300 mm, 160x320 mm.

The specimens are fixed to the table by proper bolts, ensuring perfect coupling and blocking. The two-speed revolving abrasive head moves in the two directions. The column is completely protected against the abrasive dust.

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

The machine base, from rugged plate, comprises a large room for the tools with key locking. The grinding machine is supplied complete with a collecting and water decantation tank (50 litres capacity), a motorpump, a large protection waterproof carter, eight abrasive charges, set of locking stirrups for cube specimens 100-110-150-200 mm side.

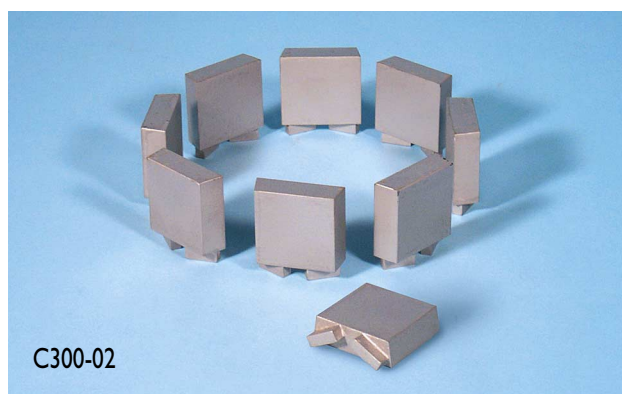


C300

- Working base surface: 680x300 mm
- Grinding wheel: 330 mm. dia.
- Vertical span width: min. 90 mm
max. 370 mm
- Power supply: 400V 3ph 50 Hz 1500 W
- Dimensions: 1300x1040x1500 mm
- Weight: 430 Kg

ACCESSORIES:

- C300-01** Spare abrasive grinding sectors (set of 8 pieces)
- C300-02** Diamond grinding sector (required quantity: 8 pieces), particularly suitable because of their long duration and good grinding action.
- C300-03** Set of locking stirrups for cylinder specimens dia. 100, 110, 150 and 160 mm
- C300-04** Set of special locking stirrups to grind at a time three cube specimens 150 mm. side.
- C300-05** Device for the automatic radial movement in both directions of the grinding head, so to get the grinding machine fully automatic.



C300-02

CURING TANKS FOR CONCRETE SPECIMENS

STANDARDS: EN 12390/2 - BS 1881:111 - UNI 6129
ASTM C31, C192, C511 - AASHTOT23
NF P18-404 - UNE 7240

C305

Curing tank, made from heavy stable and robust polyethylene, complete with analogic thermostat, immersion heating element, base rack, cock for an easier water discharge.

Temperature range: from ambient to +40 °C

Tank capacity: 650 litres

Inside dimensions: 1040x1040x605 mm

Power supply: 220-240V 1ph 50/60 Hz 2000W

Weight: 60 Kg

ACCESSORIES for mod. C305:

C306-02

Summersible pump for water circulation.

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

C305-01

Plastic cover

C305



ACCESSORIES for mod. C306:

C306-01 Rack to form the upper shelf for 150 mm cubes.
Max. 8 racks per tank.

C306-02 Summersible pump for water circulation.
Power supply: 220-240V 1ph 50/60 Hz

C306-04 Steel cover; zinc coated.



C306-02

SPARE PARTS for C305 and C306 tanks:

C306-11 Analogic thermostat

C306-12 Immersion heating element

C306-05

Analogic thermostat, complete with heating element.
Used to thermostate any type of tank from 300 to 1000 litres capacity. Power supply: 220-240V 1ph 50-60 Hz 2000W



C306-05

Water refrigerator

See mod. E141, pag. 163



E141

C306

Curing tank, made from zinc coated steel sheet to prevent it from corrosion.

Complete with analogic thermostat, immersion heating element, base rack, stopper for an easy water discharge.

Temperature range: from ambient to +40 °C.

Inside dimensions 1500x750x750 mm

The tank can accomodate up to 64 cubes 150 mm side; or up to 48 cubes 200 mm side.

Power supply: 220-240V 1ph 50/60 Hz 2000W

Weight: 120 Kg



C306 + C306-01



120

C307**Accelerated concrete curing tank**

STANDARDS: ASTM C684 - BS 1881

This tank has been designed for accelerated concrete strength curing.

It comprises a fully insulated double wall tank with cover, inside all from stainless steel, outside from steel painted sheet with an intermediate layer of insulating mineral wool.

This tank can hold up to 16 cubic 150 mm. side specimens; or 16 cylindrical dia. 150 mm. specimens; or 8 cubic 200 mm. side specimens.

The test consists essentially in curing the concrete specimens with water heated by 3 electric elements of 1500W each.

Temperature range: from ambient to 100 °C.

The separate control panel is provided with a thermoregulator; timer; pilot lights, main switch.

Inside dimensions: 910x660x680 mm

Overall dimensions: 970x720x900 mm

Power supply: 220-240V 1ph 50/60 Hz 4500W

Weight: 130 Kg



C307

section C



121

C308**Accelerated concrete curing tank with automatic curing cycles**

The tank is identical to mod. C307, but equipped with digital control panel with microprocessor enabling the operator to program an accelerated curing test in a fully automatic system, where it is possible to adjust and program:

- the heating time
- the heating temperature
- the curing time
- the cooling time
- the cooling temperature by automatic calling of cold water.

Ideal for concrete precast industries, cement factories, research laboratories.

Supplied complete.



C308 + C308-01

ACCESSORY for mod. C308:

C308-01

STRIP PRINTER, to automatically record the numeric values of time + temperature on paper with programmable printing time intervals. Supplied complete.



C311

Curing room vaporiser

Used to humidify curing rooms for concrete and mortar specimens.
Supplied complete with humidistat controller; range: 30-100%
Max. room capacity: 150 cubic/metre
Power supply: 220-240V 1ph 50 Hz
Dimensions: dia. 360x230 mm
Weight: 3,5 Kg



C312

Curing room vaporiser

Same to mod. C311, but more powerful for rooms up to 500 cubic/metre capacity.
Supplied complete with humidistat controller; range: 30-100%
Power supply: 220-240V 1ph 50 Hz
Dimensions: dia. 420x350 mm
Weight: 8 Kg



C312

ACCESSORY:

C312-01

Level regulator; it allows the direct connection to the water net, for a continuous use of the vaporisers C311 and C312.
Supplied complete of antioverflow.

C313



C313

Curing room vaporiser

For rooms over 500 cubic/metre
Vaporiser capacity: 9 l/h
Air circulating capacity: 800 cubic metre/hour
Supplied complete with humidistat controller; range: 30-100%
The unit is directly connected to the water net.
Power supply: 220-240V 1ph 50 Hz 230 W
Weight: 25 kg

C310

Recording thermometer at six channels

This recording thermometer, automatically working, is utilized to measure and record on graphics the temperature inside a concrete mass under relevant curing, to know its reactions during the heat of hydration development.

The thermometer is suitable to record simultaneously up to six readings in different points or masses, through relevant thermocouples.

- Measuring range: -10 to +110 °C
- Paper graphic width: 110 mm. with roll development of 15 metres at 60 mm/hour speed.
- Supplied complete with 50 metres of thermocouple cable, four rolls of graphic paper; accessories.
- Power supply: 220-240V 1ph 50 Hz
- Dimensions: 192x288x256 mm
- Weight: 8 Kg

SPARES:

C310-01

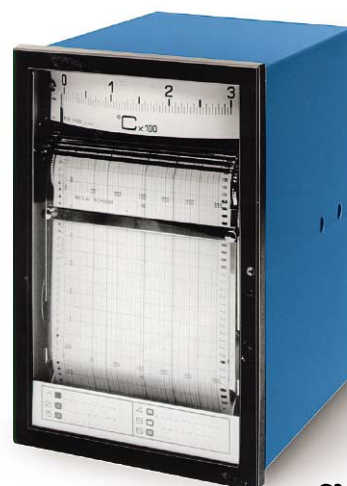
50 metres of thermocouple cable

C310-02

Rolls of graphic paper:
Pack of 10 pcs.

C310-03

Writing ink tape.
Pack of 6 pcs.



C310

C314**Climatic chamber for freeze and thaw tests, for accelerated curing tests and for general laboratory hot and cold test.**

STANDARDS: EN 196 - EN 1367/1

This thermostatic climatic chamber is designed for all the research and control laboratories where known cold and/or hot temperatures with controlled humidity values are required for any type for freeze / thaw tests, accelerated curing tests, hot and cold tests in general. Used also to check the behaviour of aggregates during freeze and thaw cycle tests according to: EN 1367/1 - ASTM C671 BS 812:124 - CNR N° 80 - UNI 8520 STANDARDS

Temperature range: -20 °C +60 °C. Accuracy $\pm 0,5$ °C.

Humidity range: 10÷90%, dew point limit +2 °C.

Inside and outside frame: totally in stainless steel

Digital display of actual and preset temperature

Internal ventilation: forced circulation.

Inside useful capacity: 520 litres.

Inside dimensions: 620x630x1390 mm

Overall dimensions: 730x860x2090 mm

Complete with 3 adjustable shelves

Power supply: 220-240 V 1ph 50 Hz 1000 W

Weight: 150 Kg

C315**Climatic chamber**, same as mod. C314 but having:

Inside useful capacity: 1200 litres

Double entrance door

Inside dimensions: 1240x730x1390 mm

Overall dimensions: 1460x860x2090 mm

Complete with 4 adjustable shelves

Weight: 230 Kg

ACCESSORIES:

C315-01 Two curves graphic recorder**C315-02** Microprocessor temperature programmer for the automatic execution of the set cycles**C315-03** RS 232 interface

THERMOSTATIC BENCH CABINETS

Temperature range from +10 to +40 °C

See section "Cement" mod. E134 - pag. 162

**E134****C314**

section C

**123****C303****Thermocouple printing thermometer four channels**

for measuring and printing automatically temperatures of precast units and determining the maturity of the concrete. The thermometer can measure and record simultaneously up to 4 different points at selectable intervals of: 1, 2, 5, 10, 30, 60, 120, 180 minutes.

Range -200 +999,9 °C with resolution 0,1 °C.

Battery operated.

Supplied complete with 50 mt coil K-type thermocouple, 5 paper rolls, ink cartridge, carrying case.

Dimensions: 220x82x66 mm

SPARES:

C303-01 K-type thermocouple, 50 mt coil**C303-02** Paper rolls, pack of 10**C303-03** Ink cartridge, pack of 2**C303****MATEST**

CORE DRILLING MACHINES

STANDARD: EN 12504-1

Matest proposes two ranges of machines:

CORE DRILLING MACHINES "LIGHTWEIGHT PORTABLE" range

CORE DRILLING MACHINES "HIGH PERFORMANCE" range

CORE DRILLING MACHINES "LIGHTWEIGHT, PORTABLE"

General description

These drilling machines are extremely practical, lightweight, easy to use.

The base is from aluminium alloy, the steel column can be angled, the motor support is fixed on rollers and ball bearings.

The motor incorporates a water swivel to cool the diamond bit.

The machine is supplied complete except: diamond bit, expander coupling and spanner (see accessories at pag. 127) to be ordered separately.

section C



124



C318

C318-01

C318-02

C318

Core drilling machine, electric motor

Electric motor at three speeds: 670, 1140, 1580 rpm, with speed reducer; provided of friction device and separate panel to 89/392/CEE Safety Directive.

The machine accepts bits dia. 50 to 150 mm

Power supply: 220-240 V 1 ph 50 Hz 2200 W

Dimensions: 450x290x860 mm

Weight: 35 Kg

C318-01

Core drilling machine, petrol driven

Petrol engine power 2500 W

Speed: 390 to 920 rpm

The machine accepts bits dia. 50 to 200 mm

Dimensions: 450x290x1060 mm

Weight: 40 Kg

C318-02

Core drilling machine, air driven

Air motor with consumption of 50 litre/sec air.

Air engine power: 3300 W

Speeds: 250 - 390 - 580 - 830 rpm

The machine accepts bits dia. 50 to 200 mm

Dimensions: 525x330x1350 mm

Weight: 68 Kg.



CORE DRILLING MACHINES "HIGH PERFORMANCE"

General description:

These drilling machines are extremely robust, heavy duty, compact and reliable.

The sliding group is rectified so as to assure a very soft and accurate drilling movement.

The drilling excursion is 550 mm and the machine can drill cores up to 200 mm dia.

The motor is advanced by a rack system with built in a water swivel to cool the diamond bit.

The robust steel base is equipped with wheels for easy site displacements, together with four levelling and stabilizing feet.

All working and moving parts are cadmium plated for rust protection.

The machine is supplied complete except: diamond bit, expander coupling and spanner (see accessories at pag. 127) which have to be ordered separately.

MODELS:

C319

Core drilling machine petrol driven, 5HP

This rugged, compact and portable machine with vertical screw feed, is used for pavement core sampling where it is not easy to get electrical power:

Petrol engine 5 HP power, 4-cycle Briggs & Stratton model.

Dimensions: 850x580x1230 mm

Weight: 135 Kg

C319-01

Core drilling machine petrol driven 8,5 HP

Same to mod. C319, but activated by a petrol engine 8,5 HP power 4-cycle Briggs & Stratton model.

Weight: 145 Kg



C319



C322

C322

Universal electric core drilling machine

Coring angle: 0 to 360°

Electric motor at three speeds: 670, 1140, 1580 rpm with speed reducer; provided of friction device and separate panel to 89/392/CEE Safety Directive.

The height of the vertical column is 1000 mm and it is pre-built for extension column connection (accessory mod. C322-01).

Power supply: 220-240 V 1ph 50 Hz 2200 W

Dimensions: 440x750x1300 mm

Weight: 85 Kg



C321

Universal core drilling machine, petrol driven

Coring angle: 0 to 360°

Petrol engine, 6 HP at two speeds: 300 and 600 rpm with speed reducer; complete with friction device.

The height of the vertical column is 1000 mm and it is pre-built for extension column connection (accessory mod. C322-01).

Dimensions: 750x440x1300 mm

Weight: 90 Kg



C321

C324

Electric core drilling machine, with vacuum facility

Coring angle: 0 to 360° under the condition that the surface is sufficiently flat to allow the vacuum attachment.

Electric motor at three speeds: 670, 1140, 1580 rpm with speed reducer; provided of friction device and separate panel to 89/392/CEE Safety Directive.

Supplied complete with vacuum pump.

Power supply: 220-240V 1ph 50 Hz 2200 W

Dimensions: 870x290x1100 mm

Weight: 38 Kg

SPARE PARTS:

C330

ELECTRIC MOTOR, for C318, C322 and C324 machines

Power 2200 Watt, three speeds 670 - 1140 - 1580 rpm complete with friction device, with connection to coolant water supply.

Double extremely safe isolation and separate panel to 89/392/CEE Directive. Connection to hub 1 1/4".

Power supply: 220-240V 1ph 50 Hz 2200 W

Weight: 9 Kg



C324

C331

PETROL ENGINE, for C319 machine

8,5 HP power; 4 cycle Briggs & Stratton model.

Supplied complete with tank, accessories

Weight: 20 Kg

V203

VACUUM PUMP for mod. C324

Power supply: 220-240V 1ph 50 hz

ACCESSORIES:

C322-01

EXTENSION COLUMN, 1000 mm long, to connect to mod. C321 and C322 for drillings over 1 metre from the ground. Supplied complete with clamping devices. Cadmium plated for rust protection.



C330

C332

**C332****PORTABLE ELECTRIC GENERATOR**

To use with electrically driven machines where electrical power is not available. The generator is rated at 4000 Watt and it supplies: 230 V 1 ph 50 Hz.

Complete with tank, accessories.

Weight: 60 Kg

DIAMOND BITS AND ACCESSORIES

Diamond core drill bits are designed for making holes and to get cores from hard materials like concrete, reinforced concrete, rock, stones, bituminous.

The diamond utilized for these bits is quality impregnated sinterized type. All bits are 500 mm. long.

The coupling between the bit and the drilling machine requires a suitable expander coupling (see table).

Two basic models of diamond bits are available:

- to core concrete, rock, stones, hard materials
- to core bituminous materials.

The core extractor allows an easy removal of the core sample from the hole.

Bits to core bitumes	Bits to core concrete	Outside dia. mm	Inside dia. mm
C340-05	C341-05	57	50
C340-06	C341-06	83	75
C340-07	C341-07	108	100
C340-08	C341-08	160	152
C340-09	C341-09	210	200

C340-05 ÷ C341-09



C343 ÷ C343-04

C346 ÷ C346-04



Expander coupling	Core extractor	Inside dia. mm
C343	C346	50
C343-01	C346-01	75
C343-02	C346-02	100
C343-03	C346-03	152
C343-04	C346-04	200

C344

Strap wrench useful for unblocking the bits

C345

Extension rod 300 mm. long (used for deep holes)





C348

Specimen cutting machine, sliding supports model

The machine accepts blades up to dia. 350 mm

Useful cutting height: 110 mm

The blade can be oriented for cuts at 45°

Dimensions of the sliding table: 500x450 mm

Blade rotation speed: 2800 rpm

Power supply:

220-240 V 1ph 50 Hz 3 Hp

Dimensions:

700x1100x680 mm

Weight: 80 Kg



C350

Specimen cutting machine

Used to cut concrete specimens and any type of construction material like blocks, tiles, pipes, rock cores etc. The machine is equipped of an electro-pump for water cooling, pedal guide for vertical cutting, safety device against breakage of blade.

The machine accepts blades up to dia. 450 mm

Power supply: 400 V 3F 50 Hz 3 Hp

Dimensions: 1220x700x1360 mm

Weight: 125 Kg



C350-01

Specimen cutting machine

Identical to mod. C350, but with:

Power supply: 220-240 V 1ph 50 Hz 3 Hp

C349

Specimen cutting machine.

Basically similar to mod. C350, but it can accept blade having max. dia. 500 mm. Power supply: 400 V 3ph 50 Hz 4 Hp

C351

Specimen cutting machine, bench type

The machine accepts blades up to dia. 355 mm.

Shear capacity: 120 mm.

Blade rotation speed: 3900 rpm

Power supply: 220-240 V 1ph 50 Hz 2000 W

Dimensions: 560x460x390 mm

Weight: 20 Kg

ACCESSORIES:

C350-11 ABRASIVE BLADE dia. 400 mm

C350-12 DIAMOND BLADE dia. 450 mm., having long life for a faster and more precise cutting operation.

C350-13 DIAMOND BLADE, dia. 350 mm

C350-15 DIAMOND BLADE, dia. 500 mm

C351



C352

DEVICE FOR CYLINDERS AND CORES

To clamp and cut cylinders and cores. The device is fixed to the table of the cutting machines mod. C348, C350, C350-01, C349

Weight 10 Kg

C353

DEVICE FOR IRREGULAR SHAPES

To clamp and to cut irregular shaped specimens, like rocks, stones etc. The device is fixed to the table of the cutting machine mod. C348, C350, C350-01, C349.

Weight: 5 Kg





MECHANICAL STRAIN GAUGES

STANDARDS: ASTM C426 - BS 1881:206

Used to determine the strain in concrete specimens and structures, rock strata etc. in remote areas and under adverse conditions using a single instrument. It consists of an extensometer with dial analogic gauge 0,001 mm. sens. calibration bar, 50 datum disks, special adhesive, carrying case.



MODELS:

C360 Strain gauge, 100 mm. measuring length

C360-01 Strain gauge, 200 mm. measuring length

C361 Strain gauge, 300 mm. measuring length

Mechanical strain gauges, identical to above (C360÷C361), but equipped with a digital gauge, battery feeded, with reading values in mm (sens. 0,001 mm) and in inch (sens. 0,0001"). Complete with battery and RS 232 connector to PC.

MODELS:

C363 Strain gauge 300 mm measuring length

C363-01 Strain gauge 100 mm measuring length

C363-02 Strain gauge 200 mm measuring length

SPARE PARTS:

C362-01 Datum disks (pack of 50)

C362-02 Special adhesive tube

Pull-off, bond strength - adhesion testers

STANDARDS: BS 1881:207 - EN 1542 - NF P18-853 - ISO 4624

See section "Cement",
mod. EI42 - pag. 164



C376

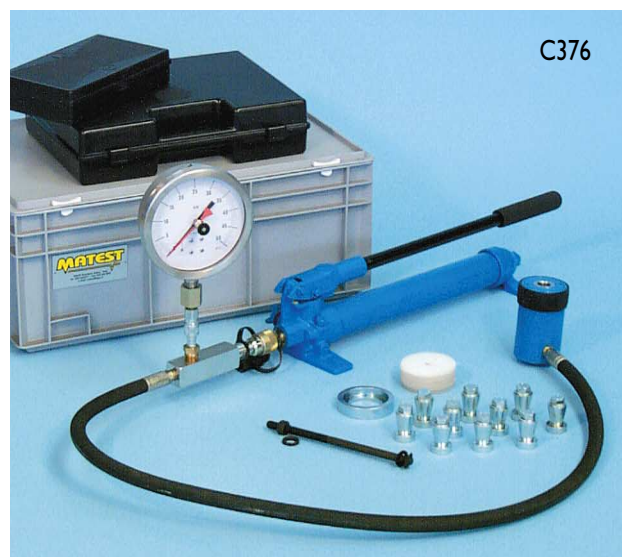
Pull-out test apparatus

STANDARDS: ASTM C900 - BS 1881 part 207 - UNI 9535
EN1542, 12504-3

Used to evaluate the concrete resistance as per the strength applied to extract an insert embedded in concrete.
Standard equipment comprises hydraulic extraction unit 50 kN capacity with pump, precision manometer, bearing ring, 10 steel inserts 30 mm. dia., carrying case.
Weight: 18 Kg

SPARE-PART:

C376-01 Pull-out inserts 30 mm. dia. Pack of 25 pieces.



C376

Hydraulic shrinkage determination

STANDARDS: UNI 6555 - ASTM C426

This test covers the determination of the hydraulic axial shrinkage of concrete specimens having 100x100x500 (or 100x100x400) mm, with aggregates up to 30 mm. max diameter. The specimen is prepared by a special mould and after housed in the measuring apparatus that determines the axial shrinkage.

The equipment consists of:



- C365** Shrinkage mould, 100x100x500 mm complete with inserts. Weight 20 Kg
- C366** Measuring apparatus, for specimens 100x100x500 mm, complete with reference bar and dial gauge 0,01 mm. sens. Weight: 23 Kg
- C365-01** Shrinkage mould, 100x100x400 mm complete with inserts. Weight 17 Kg
- C366-01** Measuring apparatus for specimens 100x100x400 mm complete with reference bar and dial gauge sens. 0,01 mm. Weight: 20 Kg

SPARE PART:

- C366-11** Steel inserts. Pack of 10



DETERMINATION OF RESTRAINED EXPANSION OF CONCRETE AND MORTAR CONTAINING THE EXPANSIVE AGENT
STANDARDS: UNI 8148, 8147 - EN 1367-4

- E114** Triple mould 80x80x240 mm

- E115** Triple mould 50x50x250 mm

- E078** Length comparator
See section "Cement" (pag. 153)



C367

Hydraulic shrinkage determination for concrete made with over 30 mm size aggregates

STANDARD: UNI 7086/72

The specimen sized 200x200x800 mm. is prepared by a standard mould (see mod. C254-04) and measured by the apparatus on six points. Supplied complete with six dial gauges 0,01 mm. sens. and reference bar.

Weight: 35 Kg



C374

Moisture meter "Surveymaster"

Used to measure the dampness in concrete and other materials, both on surface and at depth with non-destructive method.

Measurement range: 0 - 100% +/- 0,1%

Digital reading of values, audible alarm, feeding by two 1,5V batteries.

Weight: 200 g

C374



C375

Hygrometer for moisture tests

This portable tester records immediately the moisture percentage content of construction materials such as concrete, walls, plasters, gypsum etc.

The hammer electrode is inserted into the material to be tested and the instrument shows automatically and immediately the moisture percentage of the tested material. The tester is supplied complete with hammer probe, cable, casing and a numerical scale for comparative tests. Dimensions: 200x200x100 mm Weight: 2 Kg



C375





REBOUND CONCRETE TEST HAMMER

STANDARDS: EN 12504/2 - ASTM C805 - UNI 9189 - DIN 1048
BS 1881:202 - NF P18-417 - UNE 83307
ISO-DIN 8045

Designed to carry out non-destructive tests on concrete structures, it gives an immediate indication of the compressive strength of the concrete using the calibration curve supplied with.

MODELS:

C380

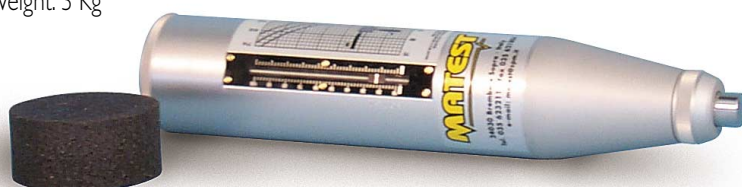
Concrete test hammer, classic model

Spring impact energy 0,225 mkg. (2,207 Joule)
Suitable for finished concrete structures and buildings having strength resistances from 10 to 70 N/sq.mm. This concrete test hammer, entirely produced by Matest, has aluminium frame, and thanks to its very accurate manufacture processing and selected components ensures high precision test results in the time. The top quality test hammer available on the market.

Supplied complete with calibration curve chart, abrasive stone, carrying case.

Dimensions: dia. 80x340 mm

Weight: 3 Kg



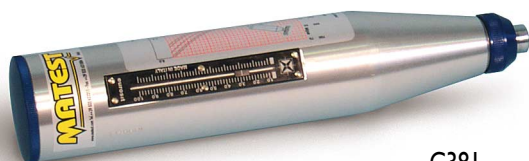
C380

C381

Concrete test hammer

Similar to mod. C380, but with impact energy of 0,735 Joule.

Ideal to test small sized, sensitive and thin walled materials. Suitable to test also rock core samples.



C381

C380-01

Digital concrete test hammer

Having the following features:

- selection of the testing angle
- selection of the measuring unit (PSI, MPA, lnd)
- reading on display of impact angle and rebound value
- record of all test values on memory RAM
- Interface RS 232 for PC connection

Battery operated.



C380-01

Original "Schmidt" test hammers

C382

Standard model "N" for normal concrete casting.
Impact energy 2,207 joule

C383

"NR" model; same as C382 model, but having an automatic incorporated device recording on diagram the impact values

C383-01

Spare roll recording paper for C383 (pack of 5)

C384

"L" model similar in shape to the "N" model, but having an impact energy of 0,735 joule and ideal for testing small and impact-sensitive materials, and rock samples.



C382

C384

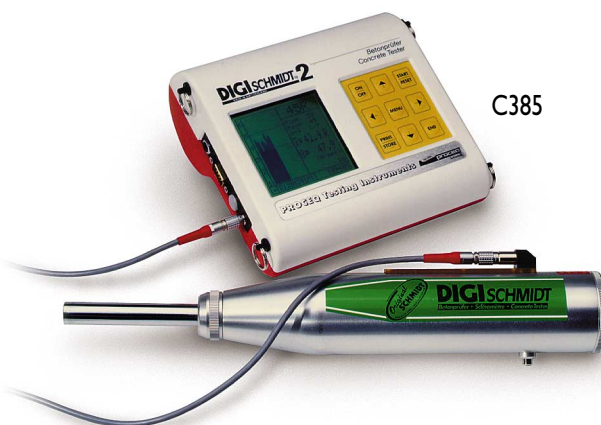


C383

C385

"DIGI-SCHMIDT 2" concrete test hammer; equipped with a sensor which measures the rebound value of a test impact with high resolution and reproducibility.

Basic settings, measured value, conversion and evaluations are shown on the display unit. Operation is menu guided. Weight 3 Kg



C385

C390

ANVIL for verification of calibration of concrete test hammers.

Dimensions: dia. 150x230 mm.

Weight: 16 Kg



C390

All other models of original Schmidt test hammers (LR, LB, P, PT, M etc.) available on request.

C368

ULTRASONIC PULSE VELOCITY TESTER with microprocessor

STANDARDS: EN 12504 part 4 - ASTM C597 - BS 1881:203 - UNI 9524 - NF P18-418 - UNE 83308

To measure material characteristics by using ultrasonic pulses.

The instrument is controlled by a microprocessor which manages the interaction with the user through a keyboard and an LCD display. All the operations are menu driven in order to supply an user-friendly interface.

section C



132



C368

The main characteristics of the instrument are the following:

- Measure of the ultrasonic pulse velocity (the distance between the two probes must be known)
- Measure of the distance between the two probes (the sound velocity in the material must be known)
- Measure of the time taken by the ultrasonic pulse to cross the material under test
- Measure of the young modulus (the following data must be known: sound velocity, material density and resonant frequency of the specimen)
- Calibration of the "zero time value" (by subtracting from the measured time value the time needed to cross the two probes)
- Calibration to a predefined value of time
- Programmable transmission pulse frequency (1, 2, 3, 4 Hz)
- Programmable pulse amplitude (250, 400, 750, 1000 Volts)
- Memory file size of 200 values for each measurable quantity
- Link to personal computer through a serial port (RS 232).

The personal computer program for the link management is supplied with the instrument

- Link to serial printers to print the stored measures

The print-out is composed by:

Number of stored values

Minimum and maximum stored values

Average and standard deviation of the stored values.

List of the stored values.

- Automatic store of the measured values
- Transmitter-receiver probes can be used by activating a special "Echo option"
- Programmable time correction factor to keep into account environmental factors like humidity
- Measurable time: 0 to 9999,99 μ s - res. 0,1 μ s
- Feeding: rechargeable battery 12V D.C.

The standard equipment comprises:

- Electronic tester with microprocessor in a portable case
- 2 probes at 55 KHz with connection cables
- 2 outlets for connection to the oscilloscope (accessory)
- Calibrating cylinder
- Battery charging device + grease coupling tube

Dimensions: 300x240x160 mm

Weight: 4 Kg

**C369****Pocket ultrasonic pulse velocity tester**

STANDARDS: EN 12504 part 4 - BS 1881:203 - ASTM C597
UNI 9524 - NF P18-418 - UNE 83308

Used to determine the presence of faults, voids, cracks etc., in in-situ or precast concrete and for longterm monitoring of structures subject to environmental conditions.

It gives data concerning the homogeneity of the concrete, by generating pulses of sound into the concrete and measuring the time the sound to travel from the transmitter probe to the receiver probe through the material. Furthermore it is possible to have indicative data about the modulus of dynamic elasticity, and strength of the concrete. The instrument is operated by n°4 x 1,5V batteries.

- Measuring range: 0 - 1999,9 μ s
- Precision: $\pm 0,1 \mu$ s
- Ultrasonic pulse amplitude: 800 Peak Volt

The instrument is supplied complete with two piezoelectric probes 55 KHz, two cables 3,5 mt. each long, low battery condition alarm, ON/OFF switch, calibration facility with calibrating cylinder, grease coupling agent, n°4 batteries, carrying case.

Dimensions: 170x90x50 mm

Weight: 900 g

**C369**

ACCESSORY for mod. C368, C369 and C370:

C370-08

Exponential couple of transmitting and receiving probes, 55 KHz

SPARE PARTS for mod. C368, C369 and C370:

C370-02 Couple of transmitting and receiving probes, 55 KHz

C370-04 Couple of cables (each 3,5 mt. long) to connect the probes to mod. C368

C370-06 Couple of cables (each 3,5 mt. long) to connect the probes to mod. C369 and C370

C370-07 Tube of grease to better coupling the probes and the material under test

C370**Ultrasonic pulse velocity tester**

Basically similar to mod. C369, it is also equipped with:

- Rechargeable battery with 10 hour service
- Battery charging device
- Two outlets for connection to oscilloscope (accessory)

Dimensions: 300x210x110 mm

Weight: 4 Kg

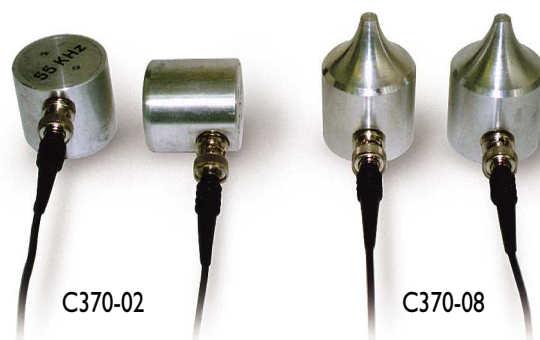
**C370****C371****C371****Oscilloscope**

It visualizes the pulses when passing the material under test, offering the advantage to verify on a monitor the correctness of the value in microseconds read on the digital display of the ultrasonic tester, i.e. that no distorted pulse transmission like for ex. reflexion, deviation etc. has altered it.

Supplied complete with connections and accessories.

Dimensions: 350x170x420 mm

Weight: 12 Kg

**C370-02****C370-08**

COVER TO REINFORCEMENT

For determining the presence, position, direction, depth and diameter of steel reinforcement bars in concrete structures.

STANDARDS: BS 1881:204 - DIN 1045

PROFOMETER 5 REBAR LOCATOR

The lightest instrument in its class, which for the first time displays reinforcing bars and concrete covers on a LCD monitor with an X/Y metre scale, even with close rebar interspacing.

An user-guiding menu technique and just 9 keys for all function ensure the simplest possible operation.

The easily readable display shows up to 240 concrete covers in grey shades.

Measure bar diameter to an accuracy of ± 1 mm.

Additional detailed technical informations available on request.

The Profometer 5 is available in two models:

C396



C396

Profometer 5, "model S" for high performances.

Measuring concrete covers. Storing data. Data processing via printer or PC. Diskette with instructions for data transfer.

Display device with non-volatile 1MB memory for 100.000 measured values and subdivisions into 72 objects. Display on 128x128 graphics LCD.

RS 232 C interface. Battery supply 60 hours, temperature range -10 to +60 °C.

Supplied complete with universal probe for spot, diameter and depth measurements, cable and carrying case.

Dimensions: 320x285x105 mm.

Weight: 2 Kg

C397

Profometer 5 "model Scanlog" for highest performance requirements. All the same features as model S, plus:

"CyberScan" function for showing the reinforcement on the display
"Measurement with grid" function for displaying the concrete coverage in the grey scale

ScanCar probe trolley with integrated distance-measuring device and cable

Transfer cable

C401

Micro Covermeter

STANDARDS: BS 1881:204 - DIN 1045

This hand held instrument with microprocessor provides digital direct readout of steel reinforcement bars in concrete structures determining their presence, position, direction, depth and diameter. Carrying case with spacer block for use in automatic bar size measuring.

An audible alarm sound to an accuracy of 1 mm. should low cover be found

Locating range: 0 to a max. that can varies with bar size, 6 mm. bar = 220 mm. - 40 mm. bar = 360 mm

Accuracy: ± 2 mm.

Power: four A4 pen cells with life greater than 50 hours

The instrument is supplied complete with maxi-probe, spacer block for diameters, 4 batteries, smart carrying case

Dimensions: 220x210x95 mm

Weight: 2,2 Kg

ACCESSORY:

C401-01

MINI PROBE. Search head for mesh or close spaced bars, complete with cable and plug.

It gives high resolutions of closely spaced bars, with extreme accuracy.

C401-01



C401





STRUCTURES DEFLECTION SYSTEM FOR TESTING AND SITE DATA ACQUISITION

8 channels microprocessor acquisition data unit, to be completed with a PC for the acquisition, visualisation, and memorising in real time of the displacements (floors, beams, corbels, trusses, piles etc.) of the structures receiving a load.

The measuring of such a displacement is taken through potentiometer transducers.

The system is composed by:

C402

Conditioning and data acquisition unit

The sampling frequency is 3 Hz with 16 bit resolution

8 poles connection panel to the sensors

Readability: better than 0,1%

Working temperature: +5° C. to +50° C.

Working at 220V and/or with inside battery at 12V with battery charger.

Working autonomy: 6 hours.

The unit is placed into a reinforced container.

Dimensions: 340x300x150 mm.

Weight : 6,5 Kg



C402

THE SOFTWARE DELIVERED WITH THE UNIT ALLOWS FOLLOWING :

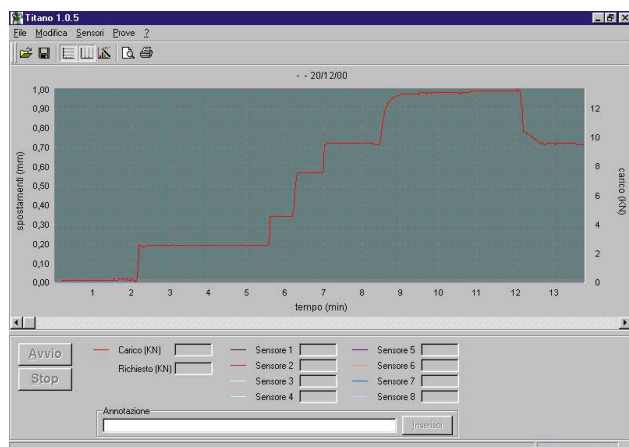
Introduction of the calibration data and zeroing.

Graphic and numerical visualisation of the situation of the deflection during the time

The programming of the time between the readings of the sensors (from 1 to 60 seconds) and updating of the graphic.

The setting of the time window of the graphic.

The saving of the test graphic and the creating of the data files.



POTENTIOMETER DISPLACEMENT TRANSDUCERS, delivered with a sensor, return calibrated springs, connection for the connector. Made in aluminium, stainless steel and nylon.

C402-01 Measuring capacity ± 5 mm - linearity 0,3% of the maximum length.

C402-02 Measuring capacity $\pm 12,5$ mm - linearity 0,2% of the maximum length.



C402-01

C402-03 Measuring capacity ± 25 mm - linearity 0,1% of the maximum length.

C402-05

Cable to connect the sensors to the measuring unit. 30 metres roll screened electrical cable with connectors.

C402-06

Telescopic rod holding the sensor for tests on floors. Made in anodised aluminium, extensible up to 5,4 m used to hold the sensors. It is delivered with a precision setting device and a shock absorber on the top. The length of the rod closed is 1,9 m and the weight is 5 Kg



C402-06

C402-07

Device for holding the sensor for test on piles, to be installed on a gauge holder.



DEFLECTOMETERS

Used to determine the deflection on bridges, ceilings or any suspended structure. Possibility to use the deflectometer with pressure or with traction. Reading is direct with a precision of 0,01 mm. One set is composed of: articulated support, dial gauge sens. 0,01 mm. with arm, 20 m invar coil, lead, carrying case.



C406

MODELS:

- C405** One set, dial gauge stroke mm. 10
- C405-01** One set, dial gauge stroke mm. 25
- C406** Three sets, dial gauges stroke mm. 10
- C407** Three sets: 2 dial gauges stroke mm. 10; one stroke mm. 25
- C407-01** Three sets, dial gauges stroke mm. 25

SPARE:

- C407-02** Inextensible invar coil 20 metres long

CRACK WIDTH GAUGES

Used for monitoring, measuring and recording the crack width of a building structure.

Internal or external use, manufactured in vandal resistant polycarbonate, complete with crack record card each gauge to simplify monitoring, they are suitable for vertical and horizontal movement measurements.

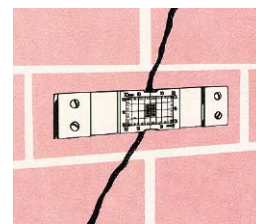
MODELS:

C408

Crack width gauge for walls

To monitor vertical and horizontal movements, also simultaneous, on a plane surface.

Pack of 5 pieces.



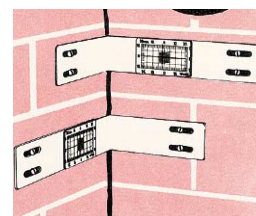
C408

C408-01

Crack width gauge for corners

To monitor corner cracks with bidirectional movements, also simultaneous.

Pack of 5 pieces.



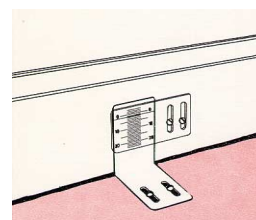
C408-01

C408-02

Crack width gauge for floors

To monitor floor settlements to a wall, column etc.

Pack of 5 pieces.



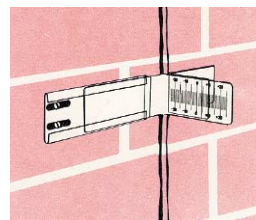
C408-02

C408-03

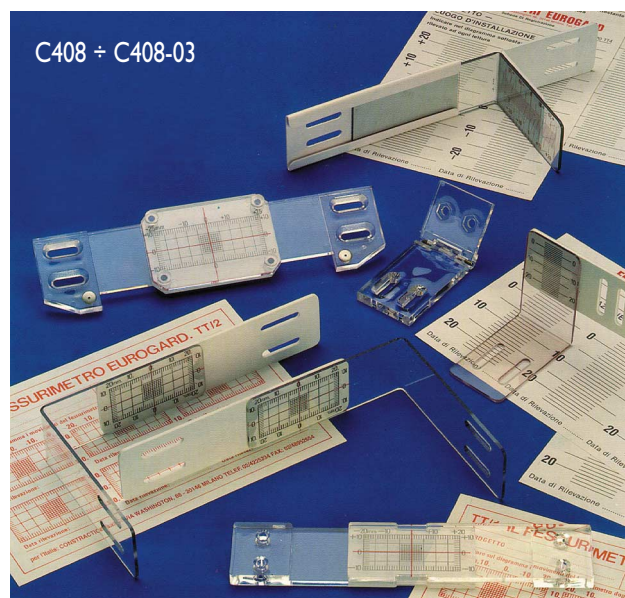
Crack width gauge for difference in levels

To monitor the loss of levelness of any cracked surface.

Pack of 5 pieces.



C408-03



**C399****Crack detection microscope**

Used to measure crack width in concrete structures, by operating via an adjustable light source.

High definition unit, provided by power batteries, carrying case.

Measuring range: 4 mm. and div. 0,02 mm.

Magnification: x35

Weight: 600 g

C399

**C410****Windsor HP probe digital system**

STANDARDS: ASTM C803 - BS 1881:207 - ACI 347

To evaluate the compressive strength of concrete in place with the penetration method. Non destructive test. It is fast, accurate and simple to perform. The five-minute test does not weaken the structure. Comparison between test results using this method and destructive tests shows a variance normally within 3% from each other. The method requires a pistol-like device which is loaded with a small explosive charge and metal probe. The charge is precisely measured to give a consistent firing force. By pulling the trigger the probe is fired into the concrete.

Standard equipment consist of:

- driven unit
- digital measuring unit with memory for data storage to PC unloading



C410

- accessories and carrying case.

Probes and power charges are not included and must be ordered separately. Dimensions: 500x400x200 mm Weight :16 Kg

ACCESSORIES:

C410-01

Probe kit silver coloured for natural aggregates with probes and power loads. The kit lasts for 75 tests.

C410-02

Probe kit gold coloured for lightweight aggregates, with probes and power loads. The kit lasts for 75 tests.

C411**Canin****CORROSION ANALYSING INSTRUMENT**

STANDARDS: UNI 9535 - ASTM C876 - BS 1881:201

For the non-destructive detection of corrosion in the reinforcement bars of concrete building elements.

The large display, just 9 keys for simple operation using menu technique and intelligent memory render Canin a unique instrument worldwide.

120.000 measurements can be stored in the intelligent memory and called up with the cursor keys. A measuring surface of more than 4000 sq.mt. can be managed with the large memory. Standard supply includes one bar electrode, RS 232, integrated software for printer, cables, copper sulphate, carrying case.

Dimensions: 300x330x100 mm

Weight: 5 Kg

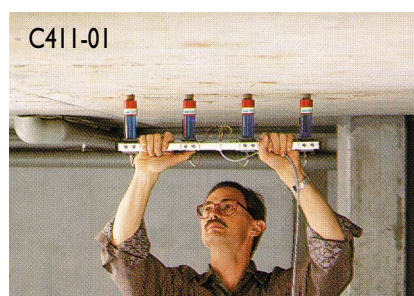


C411

EXTENSIONS:

C411-01

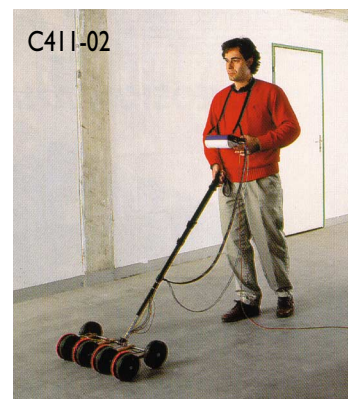
Four bars electrodes system with divisions of 150 mm, for bottom view and vertical operation, complete with accessories.



C411-01

C411-02

Four wheels electrodes system, for horizontal operation, complete with accessories.



C411-02



C412

Half cell digital corrosion meter

STANDARDS: UNI 9535 - ASTM C876 - BS 1881:201

The digital half-cell enables rapid location of corroding reinforcement without disrupting the concrete cover.

The unit is a hand set with an integral (removable) Ag/AgCl/Sat. KCl mapping electrode for maintenance free long term stability and the instrument automatically converts and displays the measurements as Cu/CuSO₄ equivalent potentials.

The unit is battery powered giving typically 1000 hours use with low battery indicator.

The nylon carrying case also contains a 10 m reference lead, sponge head, protective nylon cover and an extension kit with fold-up extension rod to enable remote surveying and fatigue free testing of bridge decks etc.

- Detachable silver/silver chloride mapping electrode

- Range/resolution: + 1999 mV ± 1mV

Dimensions: 350x300x200 mm

Weight: 7 Kg



C412

C413

Digital resistivity 2-probe array meter

Used for assessing the probable rate of corrosion in reinforcing bars with the electric resistivity measurement method.

The test is simple to perform and requires only two 6.5 mm diameter holes drilled to a depth of 8mm. Inject a small amount of conductive gel into each hole and insert the probes. The resistivity is immediately displayed.

Low frequency alternating current technique used.

3 digit LCD display.

Less than 2 minutes per test.

Battery: single NIMH604 giving approx. 100 hours operating time.

Dimensions: 410x260x140mm

Weight: 3 Kg



C413

C413-01

Digital resistivity 4-probe Wenner meter

Similar to mod. C413 except for the probe used by surface contact and no hole is required.



C413-01

C415

Scribe multirole data-logger

A unique multipurpose surveying system for measurements of reinforced concrete structures:

- Half cell potential
- Concrete resistivity
- Cover and estimated size of reinforcement
- Electrical continuity of reinforcement

The MultiRole Data-logger is at the heart of the system for which a number of add-on "heads" have been developed, which convert it to an instrument for the measurement and assessment of related characteristics. Select the role required on the data-logger; connect interface and appropriate "head" and commence survey.

The system comprises:

- Datalogger digital power pack. Non volatile memory storage for up to 100,000 measurements paged X-Y co-ordinate. Review and overwrite facility. Free stepping in any direction. 4-line display screen. Date stamping of each "page" of results. 7 positive action push button control with on-screen guidance. 5 data processing formats for half-cell potential results inc. ASTM C876 parameters. Computer data collection software provided. Output for printer or PC downloading of results.
- Half-cell potential Ag/AgCl mapping refillable electrode complete with 10m reference lead, sponge for mapping electrode. Potential measurement displayed in 1mV increments and logged to nearest 10mV as required by ASTM C876
- Resistivity meter; Wenner 4-probe array with spring loaded probes: Interface & holster. Rebar electrical continuity test assembly, reference leads.
- Digital Covermeter with search head, interface, holster; calibration block, interconnected head.

Measuring range: 5 to 105 mm cover
bar size estimation: dia. 4 to 45 mm
Accuracy: to BS 1881:204 over range specified in BS8110

C415



ACCESSORY:

C415-01

Printer, 40 columns, complete with charger.

**C430****Automatic concrete water permeability apparatus at four cells**

This fully automatic apparatus is designed to carry out water permeability tests on cubic concrete specimens max. 150 mm side and cylinder specimens max. 160 mm diameter. The specimens are submitted to hydrostatic stress for a pre-set period. The water permeated through the test specimen is directly collected and measured into a graduated cylinder.

It is therefore possible to determine the permeability coefficient in cm/sec. (Darcy coefficient) by the following formula:

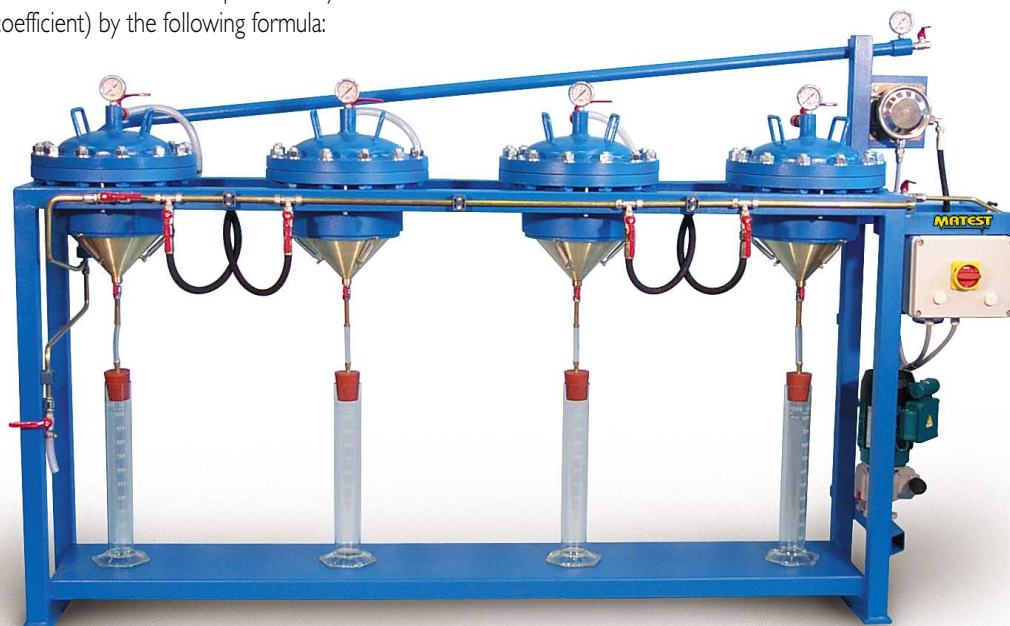
Supplied complete with four cells, four graduated cylinders, epoxy resin and accessories. The sealing devices are not included in the standard package and must be ordered separately.

Power supply: 220-240 V 1 ph 50 Hz

Dimensions: 2500x500x1300 mm

Weight: 240 Kg

C430



$$K = \frac{cc \times h}{A \times t \times P}$$

where: cc = permeated water in cm³
 h = height of the specimen (cm)
 A = surface area of the specimen (sq. cm.)
 t = time to permeate (sec.)
 P = hydrostatic pressure in cm. of water column

The equipment consists of a strong metallic frame holding four cells which are hot-galvanized for anti-corrosion protection.

Each cell includes a pressure control manometer.

A re-chargeable compensation plenum chamber is included as part of the test.

The pressure is adjustable from 0 to 30 bar (0-20 bar for mod. C431), and it is supplied by an automatic pump of variable supply, to achieve the most suitable installation for the specimen under test. Water feed is direct from water inlet.

Seal pressure obtained through special and practical seal devices which maintain and simplify the use of the machine.

It is possible to use one or more cells together.

The specimen's sealing system is achieved through a practical and speedy, user-friendly device.

ACCESSORIES for mod. C430 and C431:

SEALING DEVICE, complete with rubber latex packing which is between the two hot-galvanized steel collars. Complete with bolts.

MODELS:

- C432-01** Sealing device for cubes 100 mm side
- C432-02** Sealing device for cubes 150 mm side
- C432-03** Sealing device for cubes 200 mm side
- C432-04** Sealing device for cylinders dia. 100 mm
- C432-05** Sealing device for cylinders dia. 150 mm
- C432-06** Sealing device for cylinders dia. 160 mm
- C432-07** Sealing device for cylinders dia. 300 mm

**C433**

EPOXY RESIN, to isolate the lateral surfaces of the concrete specimen. Can of 5 Kg



C43I

Automatic concrete water permeability apparatus

at two cells, similar to mod. C430, but suitable for carrying out tests on concrete cube specimens max. side 200 mm, and cylinder specimens max. dia. 300 mm. Supplied complete with two cells, two graduated cylinders, epoxy resin and accessories. The sealing devices are not included in the standard package and must be ordered separately. An original device allowing the cells to rotate up to 90° is included, for easier insertion of the specimen.

Power supply: 220-240 V 1 ph 50 Hz

Dimensions: 2200x700x1400 mm

Weight: 380 Kg

C43I



C435

Water impermeability tester

STANDARDS: DIN 1048 - EN 12390/8

ISO 7031 - UNI 9533

Apparatus at 3 points to determine the depth of penetration of the water into the concrete (impermeability) under known time and pressure.

The unit accepts up to 3 concrete cubic, cylindrical or prismatic specimens having max. dimensions of 200x200x200 mm.

The specimen is put into the test chamber, clamped with suitable flanges and gaskets, and then a known water pressure is applied on the specimen's surface for a time as requested by Standard, by using a suitable air compressor (accessory) having at least 5 bar pressure capacity.

The water penetrated is measured by breaking the specimen, or by reading the water permeated through the graduated burette fixed on the front panel.

Dimensions: 1400x750x1700 mm

Weight 280 Kg

C435



ACCESSORY:

V206

Laboratory air compressor.

MATEST manufactures a complete range of Mobile Laboratories as:

- Trailer-type mobile laboratory.
- Van-mounted mobile laboratory.
- Container mounted laboratory.

Both of small or large dimensions, by supplying also the mobile structure, benching, furniture, generators, air conditioning, electronic and plumbing installation etc; or by simply fixing the Testing Equipment on the mobile structure supplied by the customer.



Matest's technical staff is at complete disposal of the customer to study any specific requirement and to submit detailed proposals to satisfy the end-user's necessities.



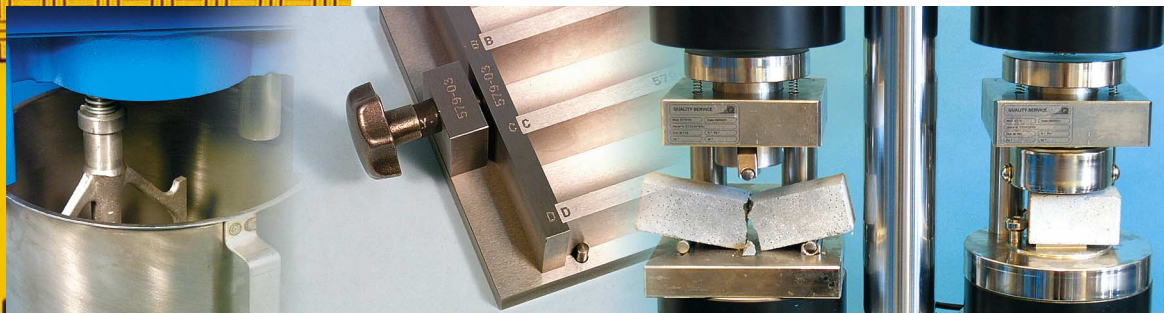
Section E

CEMENT - MORTAR

The raw materials like: limestone, chalk, shale, clay etc., mixed with water, are crushed, ground and blended. They are now submitted to a chemical process in a rotary kiln until they combine into clinker. From the clinker opportunely mixed with gypsum, the cement factories obtain the modern Portland cement, that may be modified in more and more sophisticated binders like expansive mortars, pre-mixed cements etc.

In section "Cement & Mortars" Matest proposes a complete range of equipment for:

Fineness, Consistency, Setting-time, Workability, Soundness, Flow, Fly Ash, Chemical Tests etc.; and for Mixing, Moulding, Curing and Strength Tests, to satisfy all the above quality variables, in compliance with the EN, ASTM and the most known International Standards.



Index section

CEMENT - MORTAR

	Mod.	Page		Mod.	Page
Air entrainment meter	E027	145	Jolting table.....	E130	161
Air content of mortars: measurers	E029	146	Le Chatelier flask.....	E014	144
Air permeability apparatus.....	E010	144	Le Chatelier mould.....	E066	154
Autoclave for soundness.....	E070	152	Le Chatelier water bath	E064	154
Balance, mud, Baroid.....	E037-01	147	Length comparator.....	E078	153
Baths, for curing.....	E136	162	Marsh funnel viscometer.....	E037	146
Bath, Le Chatelier.....	E064	154	Mixers, mortar.....	E093/E095	158/159
Blaine air permeability.....	E010	144	Moulds: shrinkage and expansion	E072/E115	152/153
Briquette moulds.....	E108	161	Moulds : prisms, briquettes.....	E100/E112	160/161
Bulk density of cement.....	E025	145	Mould: Le Chatelier.....	E066	154
Bulk density of lime.....	E091	155	Mud Baroid balance.....	E037-01	147
Calorimeter, heat of hydration.....	E062	151	Pat test.....	E082	155
Compression/Flexural devices.....	E170/E172	167	Permeability, air, Blaine.....	E010	144
Compression/Flexural machines.....	E151/E182	165/169	Photometer, flame.....	E063	151
Craking test mould, NF P15-434.....	E067	154	Plaster extensometer.....	E080	155
Cube mould.....	E110/E133	161	Plunger penetration apparatus	E083	154
Curing baths and cabinets.....	E134/E139	162/163	Prism moulds.....	E100/E112	160/161
Dropping ball apparatus.....	E031	146	Pull-Off, Bond strength testers	E142-02.....	164
Dynamometers, pull-off, bond strength.....	E142-02.....	164	Retention water apparatus	E039	147
Extensometer, plasters.....	E080	155	Samplers, bulk and packaged cement.....	E020/E021	145
Fineness of fly ash by wet sieving.....	E017	144	Setting time of cement.....	E040/E054	148/150
Flame photometer.....	E063	151	Soundness: Autoclave.....	E070	152
Flexural/Compression machines.....	E160/E182	166/169	Soundness: Le Chatelier	E066	154
Flexural device.....	E172-01	167	Table, flow of mortar	E084/E090	156/157
Flowing water sieve.....	E016	144	Vibrating machine, cube 70,7 mm.....	E132	161
Flow cone apparatus.....	E038	147	Vicat apparatus: automatic and manual	E040/E054	148/150
Flow tables	E084/E090	156/157	Viscosity: Marsh funnel.....	E037	146
Fly ash fineness by wet sieving.....	E017	144	Water baths: curing of cement.....	E134/E139	162/163
Free expansion in plastic period.....	E060	150	Water bath: Le Chatelier.....	E064	154
Funnel groove, UNI 8997.....	E059	150	Water flowing sieve device.....	E016	144
Funnel viscometer; Marsh	E037	146	Water refrigerator	E141	163
Gillmore apparatus	E058	147	Water retention apparatus	E039	147
Hydration calorimeter.....	E062	151	Workability apparatus.....	E081	155





E010

Blaine air permeability (fineness) apparatus

STANDARDS: EN 196/6 - ASTM C204 - AASHTO T153
BS 4359/2 - UNI 7374 - NF P15:442 - UNE 80106

Used to determine the fineness of Portland cement in terms of the specific surface expressed as total surface area in square centimeters per gram of cement.

The apparatus is supplied with glass U-tube manometer with valve, steel stand, test cell with disk and plunger all in stainless steel, rubber aspirator bulb, 1000 filter paper disks, manometric liquid, thermometer; accessories.

Weight: 12 Kg



E010

ACCESSORY:

E010-02

Standard reference cement 14p to ASTM/SRM/EN to calibrate the Blaine

SPARES:

E010-01 U-tube glass manometer complete

E010-03 Manometric liquid 200 ml bottle

E010-04 Filter paper (pack of 1000 pieces)

E010-05 Cell body, stainless steel

E010-06 Cell plunger, stainless steel

E010-07 Cell perforated disk, stainless steel

E014

Le Chatelier flask

STANDARDS: EN 196/3 - ASTM C188
AASHTO T133
UNE 83453

Used to determine the relative density (specific gravity) of hydraulic cement and lime. Capacity 250 ml. The neck is graduated from 0 to 1 ml and from 18 to 24 ml with divisions of 0,1 ml.

Weight: 500 g



E014

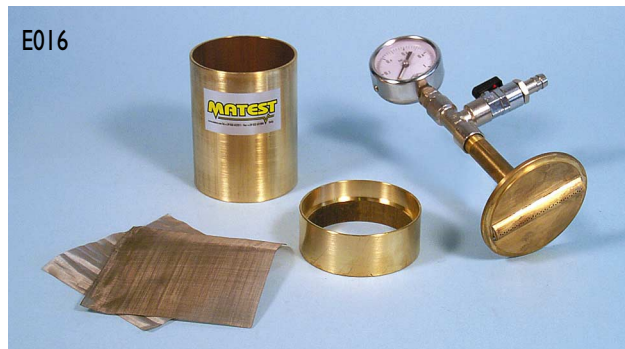
E016

Water flowing sieves device

STANDARD: D.M. 3/6/68

Used to determine the fineness of cement. It consists of a spraying unit with feed cock and gauge; brass sieve body 85 mm dia. and 95 mm high with two stainless steel cloth disks having opening 0,18 and 0,09 mm. A cement sample of 25 g. is placed inside the sieve and washed for two minutes by means of the spraying unit put on top of the sieve. The residue of the retained cement is obtained by drying the sieve at 110 °C.

Weight: 3 Kg



E016

E017

Fineness of fly ash by wet sieving

STANDARDS: EN 451:2 - ASTM D430

The set, brass made, consists of: sieve dia. 50 mm. with stainless steel mesh opening 0,045 mm, spray nozzle 17,5 mm ID with 17 holes dia. 0,5 mm, pressure gauge dia. 80 mm range 0-160 kPa, div. 5 kPa, fittings and connectors.

Weight: 3 Kg



E017



E020

Bulk cement sampler

STANDARDS: ASTM C183 - AASHTO T127
EN 196/7

Used to sample cement in bulk storages or shipment. Made of brass, it consists of two concentric tubes with slots.
Inside tube volume is 3 litres approx.
Dimensions: dia. 40x1500 mm
Weight: 5 Kg

E021

Packaged cement tube sampler

STANDARDS: ASTM C183 - AASHTO T127
EN 196/7

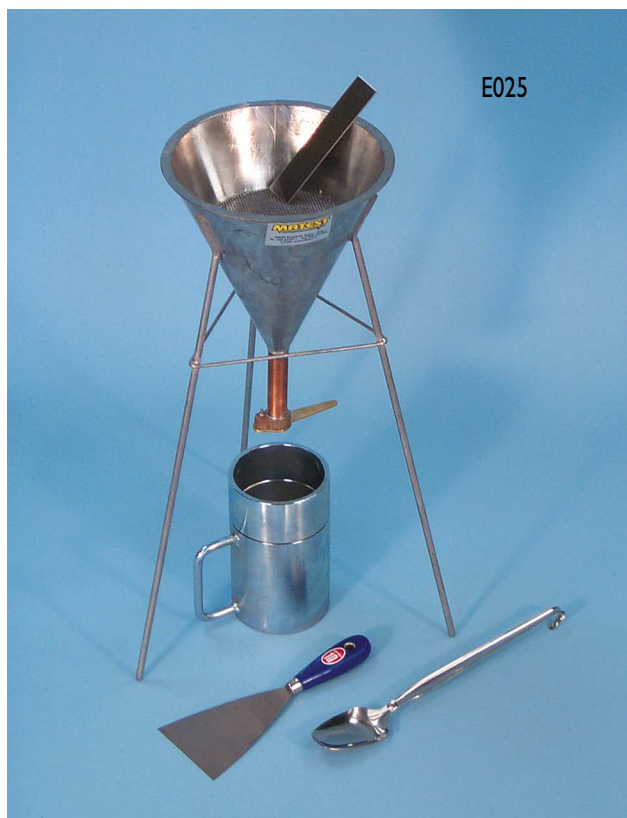
Used to sample cement homogeneously from cement bags.
Dimensions: dia. 32x700 mm
Weight: 2 Kg



E025

Bulk density of cement

This apparatus is used for the measurement of the apparent density (bulk density) of powders and non-cohesive materials. It consists of sieve funnel with tripod, unit weight measure 1 litre capacity with hopper, spatula, straight edge, large spoon.
Dimensions: dia. 350x520 mm
Weight: 6 Kg



E027

Air entrainment meter 1 litre capacity

STANDARDS: EN 413/2 - DIN 1164

Made from cast aluminium, the test pot and the upper part are air-tight sealed. The whole is connected to a dial gauge indicating directly the air entrainment in percentage, with range 0-50%.
A built-in operated air pump is also included.
Dimensions: dia. 200x320 mm
Weight: 4 Kg



E028

Air entrainment meter, same as mod. E027, but with incorporated an electric mini-compressor giving air pressure and keeping it constant all along the test.

Power supply: 220-240V 1ph 50 Hz
Weight: 6 Kg

ACCESSORY:

E028-01

FILLING HOPPER for the air entrainment meters E027 and E028

Air content of freshly mixed mortars by the density method

MODELS:

E029

Measurer 400 ml capacity

STANDARDS: ASTM C185-85 - AASHTO T137

Steel made, internal diameter 76,2x88,1 mm height

E030

Measurer 500 ml capacity

STANDARD: BS 4551

Steel made, internal diameter 76x110 mm height

E031

Dropping ball apparatus

STANDARDS: BS 4551-1, 6463-4

Used to measure the consistency of cement mortars, this instrument allows a mm. 25 diameter acrylic ball to fall freely from a standard height of 250 mm. into a specimen of mortar contained into a mould, and the surface of which has been carefully prepared. The depth of the ball penetration into the mortar gives the specimen consistency. The instrument comprises a dropping device mounted on a stand, acrylic ball, mould dia. 100x25 mm. The base of the stand is machined. Chromed finishing. Weight: 8 Kg

ACCESSORY:

E031-01

BALL PENETRATION MEASURING DEVICE, formed by a tripod on which a dial gauge 25x0,01 mm is mounted. A device to adjust the height of the dial in relation to the tripod is also included. Chromed finishing. Weight: 1 Kg



ACCESSORIES:

E030-01 HARD PLASTIC TAMPER, dia. 37,5±0,5 mm. Weight: 250 g

E055-07 GLASS PLATE, nominally 120 mm diameter

V192-08 CHATTAWAY spatula

E037

Marsh funnel viscometer

Utilized for viscosity determination on drilling muds and fluid materials.

Orifice opening 4,7 mm

Half part of the funnel mouth is foreseen of sieving cloth 2 mm mesh.

Plastic break-resistant made.

Supplied complete with graduated cup.

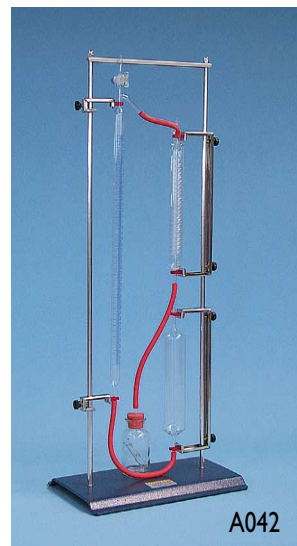
Weight: 1 Kg



A042

CALCIMETER, DIETRICH-FRÜHLING for the determination of the CaCO₃ (Calcium Carbonate) in limestone and lime marl.

See Section "Aggregates" pag. 11



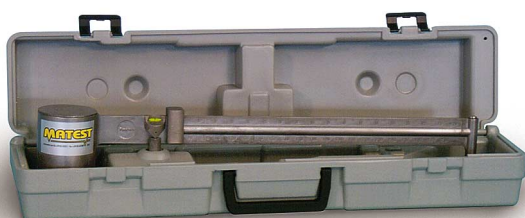


E037-01

Baroid mud balance

It provides a simple method for the accurate determination of mud density, with the advantage that the temperature of the drilling mud does not materially affect the accuracy of readings.

The balance consists of a base and graduated arm with cup, lid, knife edge, rider, built-in spirit level and counter-weight, carrying case. The constant volume cup is affixed to one end of the graduate arm and the counter-weight on the opposite end. Weight: 5 Kg



E037-01

E038

Flow cone apparatus

STANDARD: EN 445

Used for viscosity and fluidity determinations of mortars, muds, grouts, fluid materials, etc. Cone top dia. is 155 mm, total length 290 mm, capacity 2000 cc.

Mortar fluidity is considered suitable when the flow time of 1000 cc of mortar is comprised between 17 to 25 seconds.

Entirely brass made, it is supplied complete with four interchangeable nozzles dia. 8 - 9 - 10 - 11 mm, stand adjustable in height, plastic graduated cup.

Weight: 10 Kg

ACCESSORY:

E038-01

Interchangeable nozzle dia. 12,5 mm for the flow cone E038



E038

E039

Water retention apparatus

STANDARDS: ASTM C91, C110

Used to determine the density of masonry cement and lime putty so to obtain a yield volume value.

The unit comprises a water aspirator, mercury column, manometer, three-way stop-cock, metal perforated disk, glass funnel, stand, mercury valve, pack of paper filter disc, 1 Kg. of mercury, accessories, but except the pump which must be ordered separately. Dimensions: 500x280x600 mm Weight: 8 Kg

ACCESSORY:

V203

Vacuum pump. Power supply: 220-240V 1ph 50 Hz



E039

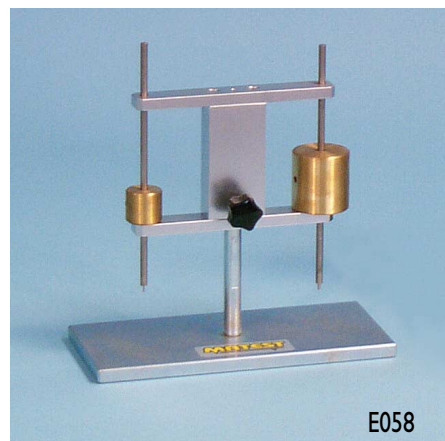
E058

Gillmore apparatus

STANDARDS: ASTM C91, C141, C266 - AASHTO T154

Used to determine the setting time of cement. Vertical support shaft has a device to maintain the horizontal arms in alignment. Support assembly is adjustable in position. The two steel weights needles are calibrated to meet Specifications. Needle points are from stainless steel. The initial setting needle has dia. 2,12 mm and weight of 113 g, while the final setting needle has dia. 1,06 mm and weight of 453,6 g.

Weight: 3 Kg



E058

E040

AUTOMATIC RECORDING VICAT APPARATUS

STANDARDS: EN 196/3 - D.M. 3/6/68 - ASTM C191 - DIN 1164, 1168 - BS 4550 - UNE 80102 - NF P15-414, P15-431 - AASHTO T131

Used to determine the initial and final setting time of an hydraulic binder; this electronic recording unit performs the complete test cycle in a totally automatic system, ensuring results of absolute precision and repeatability.

The probe weights 300 g. according to Standards (1000 g. acc. to EN, NF), and the needle has a dia. of 1,13 mm. (1 mm. acc. to ASTM). The unit executes one complete penetration cycle in 30 seconds time, or at time intervals of 1 - 5 - 10 - 15 - 30 minutes from one penetration to another.

The drum holding the diagram rotates at each penetration; the lower horizontal line of the diagram corresponds to the max. needle penetration.

On top of the probe there is a writing device recording on a diagram the needle penetrations into the specimen.

In case of blackout, also momentaneous, during the execution of the test, the instrument informs the operator that the results of the test are not correct.

Therefore the operator, once programmed a test, may leave the instrument and check later the regularity of the execution and relevant results.

The keyboard of the unit allows to select programs according to the following Standards:

- EN, DIN with free fall of the probe
- UNI, ASTM, NF, BS, UNE with driven fall of the probe.

The instrument foresees also a program for tests on gypsum according to DIN 1168 Standard (Weight: of the probe 100 grams and conical needle dia. 8x50 mm - see accessories).

The automatic vicat is supplied complete with: two penetration needles dia. 1 and 1,13 mm; two plastic moulds to EN and ASTM Standards, glass base plate, writing ink pen and pencil, 100 recording diagrams.

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

Dimensions: 200x350x420 mm

Weight: 9 Kg

E040-01

Automatic recording Vicat apparatus,

same to mod. E040, but manufactured by utilizing anti-corrosive materials and tropicalized components, for continuous utilization of the unit in saturated humidity rooms at controlled temperature of 20 ± 1 °C, as requested by EN 196-3 Standards.



E040





ACCESSORIES FOR GYPSUM TEST (DIN 1168)

E045-01 CONICAL PENETRATION NEEDLE dia. 8 mm, long 50 mm

E045-08 PROBE 100 g. weight



ACCESSORIES:

E043

Mould tank, for testing in water of the specimen. The test has to be performed in a room having controlled temperature of 20 ± 1 °C. The saturated humidity is obtained by submerging the specimen in water; as prescribed by EN 196-3 Specifications (not usable with the needle cleaning device E041).



E043-01

Thermostatic water heating/cooling system

This device produces water at controlled temperature of 20 ± 1 °C and circulated into the tank E043 by ensuring the test execution at saturated humidity and controlled temperature, as requested by EN 196-3 Standards.

Power supply: 220-240V 1ph 50 Hz 1150 W

Dimensions: 615x375x400 mm

Weight: 24 Kg

E041

Needle cleaning device, to remove the cement residual particles from the needle during its going up, by keeping it lubricated to avoid easy foulings (not usable with the mould tank E043).

E047

Timer range 0-999 minutes, allowing to preset a delayed starting of instrument operation. This device is particularly suggested when estimated setting of the cement paste is already known, and the operator wants to start the automatic vicat after a fixed time so as to concentrate the needle penetrations in short penetration intervals and to obtain a more accurate setting result.



E042 Needle for final setting EN/BS dia. 1,13 mm

E042-01 Needle for final setting ASTM dia. 1 mm

E042-02 Consistency plunger dia. 10x50 mm long.

E046-07 Additional weight: 700 g (NF/EN Specifications)

E055-04 UNI mould, plastic dia. 80/90 h 40 mm

E055-13 DIN mould, plastic dia. 65/75 h 40 mm

E055-11 BS mould, brass dia. 80/90 h 40 mm

E055-12 BS mould, brass, split in two halves with ring dia. 80/90 h 40 mm

SPARE-PARTS:

E046 Needle having dia. 1,13 mm (EN - UNI - NF - DIN - BS)

E046-01 Needle having dia. 1 mm (ASTM)

E046-02 Recording diagrams (pack of 500)

E055-07 Glass base plate

E055-05 Mould dia. 60/70 mm (ASTM)

E055-10 Mould dia 70/80 mm (EN - NF)

E046-05 Writing ink pen

E046-08 Writing pencil

E046-09 Set of leads for pencil

E054

Vicat apparatus

Used for setting time and consistency of cement

STANDARDS: EN 196:3 - ASTM C187, C191 - AASHTO T129, T131
DIN 1164 - BS 4550 - NF P15-414 - D.M. 3/6/68
UNE 80102

The instrument consists of a metallic frame, graduated scale with index, sliding probe of 300 g, consistency plunger dia. 10 mm, glass base plate, thermometer:

The needle and conical mould are not included and have to be ordered separately (see accessories)

Dimensions: 160x200x300 mm

Weight: 5 Kg

ACCESSORIES:

E055-06 Additional weight 700 g to the sliding probe
(Standards: EN - NF)

E042 Final needle dia. 1,13 mm
(Standards: EN - NF - BS - DIN - UNI - UNE)

E042-01 Final needle dia. 1 mm (Standards: ASTM - AASHTO)

SPARE PARTS:

E055-07 Glass base plate dia. 120 mm

E055-03 Consistency plunger dia. 10 x 50 mm

E055-08 Thermometer range 0 - 50°C

E059

Funnel groove

STANDARD: UNI 8997

Used to determine the consistency of the expansion premixed cement mortars for anchorages, mixed with water; classified of super-fluid type. Supplied complete.

Weight: 20 Kg



150



E054
WITH ACCESSORIES

NEEDED ACCESSORIES

INITIAL PENETRATION NEEDLE:

E046 Needle dia. 1,13 mm
(Standards: EN - BS - NF - DIN - UNI - UNE)

E046-01 Needle dia. 1 mm (Standards: ASTM - AASHTO)

CONICAL MOULDS:

E055-10 Conical plastic mould dia. 70/80 h 40 mm
(Standards: EN - NF)

E055-05 Conical plastic mould dia. 60/70 h 40 mm
(Standards: ASTM - AASHTO)

E055-04 Conical plastic mould dia. 80/90 h 40 mm (Standard: UNI)

E055-13 Conical plastic mould dia. 65/75 h 40 mm (Standard: DIN)

E055-11 Conical brass mould dia. 80/90 h 40 mm (Standard: BS)

E055-12 Conical brass mould dia. 80/90 h 40 mm in two halves with ring (Standard: BS)



E059

DETERMINATION OF THE FREE EXPANSION IN PLASTIC PERIOD, and of the exudation quantity of the mixing water on expansion premixed mortars for anchorages, mixed with water:
STANDARDS: UNI 8996, 8998

The equipment consists of:

E060 Bridge of dual measure, formed by a steel square straightedge with two adjustable measure screws

E060-01 Fix caliper at two steps, having heights of 100 and 107 mm

E060-02 Metallic container with hermetic cover dia. 99x116 mm





151

E062

Calorimeter - heat of hydration

STANDARDS: E196/8 - ASTM C186 - BS 4550, 1370 - UNI 7208
DIN 1164 - UNE 7105, 80102

Used to determine the heat of hydration of cement by the solution method.

The apparatus consists of a dewar flask which is housed in an insulated wooden box, constant speed electric stirrer, Beckmann centesimal thermometer and funnel pouring the cement.

The wooden box is hinged so that the flask can be easily removed or replaced.

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

Dimensions: 350x250x650 mm

Weight: 15 Kg

ACCESSORY:

V300-19

Paraffin wax with melting point at 55 °C to coat the glass parts which are in contact with the hydrofluoric acid. Pack of 1000 g

SPARE PARTS:

E062-01 Dewar flask

E062-02 Beckman thermometer



E062

E063

Flame photometer

STANDARDS: EN 196:21 - ASTM C114:17 - BS 4550

Used to determine the alkali content of cement

Supplied complete with sodium (Na) and Potassium (K) filters, fuel and air connections, accessories.

Digital readout: 0 to 199,9 ppm

Reading range: K or Na 3 - 100 ppm, sens. 3 ppm

Reproducibility: 1% coefficient of variation for 20 consecutive samples. Operates on propane, butane, natural gas supplies

Air supply: 6 litre/min. with pressure of 1 Kg/cm²

Power supply: 220-240V 1ph 50 Hz

Dimensions: 420x360x300 mm

Weight: 8 Kg



ACCESSORIES:

V206 Laboratory air compressor

E063-01 Lithium (Li) filter

E063-02 Barium (Ba) filter

E063-03 Calcium (Ca) filter

E063-04 Natural gas regulator

E063-05 Propane gas regulator

E063-06 Butane gas regulator

LOSS-ON-IGNITION OF CEMENT AND BUILDING LIME AND CONTENT OF CHLORIDE, CARBON DIOXIDE AND ALKALI INTO THE CEMENT

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

A muffle furnace is used to oxidize the sample in air at 975 ± 25 °C.

See section "Aggregates"

mod. A024 pag. 9



A024



E070 Autoclave for soundness (expansion) of portland cement

STANDARDS: ASTM C151, C141 - D.M. 3/6/68 - UNE 7207

It consists of a high pressure boiler made from special alloy steel, inside dia. mm. 154x430 high, receiving a holding rack for 10 cement specimens. The heating system is achieved by electric resistances. The control unit encloses a pressure gauge with built in pressure regulator and power switches. Supplied complete with safety valves. Power supply: 220-240 V 1ph 50/60 Hz 3500 W 295 psi Dimensions: 450x475x1080 mm Weight: 75 Kg



E070

E071
Autoclave, basically similar to mod. E070, capacity 8 litres, max. pressure 25 bar (2,5N/mm²), inclusive security-test certificate to CE Safety Directive. Power supply: 220-240 V 1ph 50/60 Hz 2300 W Dimensions: dia. 550x1120 mm Weight: 80 Kg



E071

MOULDS FOR EXPANSION (SOUND- NESS) AND SHRINKAGE TESTS

Available models:

E072

STANDARD: ASTM C490

Two gang prism mould to produce 25x25x250 mm specimens for expansion tests in autoclave. Complete with 4 steel inserts. Weight: 6 Kg

E073

STANDARD: BS 1881, 6073

Two gang prism mould to produce 75x75x254 mm specimens. Complete with 4 steel inserts. Weight: 9 Kg

E072-01

Spare stainless steel inserts for E072 and E073 moulds. Pack of 10 pieces.



E074

STANDARDS: UNI 6687 - ASTM C348

Three gang prism mould to produce 40x40x160 mm specimens. Made from Cr/Ni steel, hardness 60 HRC. All surfaces are grinded with tolerances within 0,1 mm. Complete with 6 inserts. Weight: 12,5 Kg

E074-01

Spare stainless steel inserts for E074 mould. Pack of 12 pieces.

E107

STANDARDS: NF P15-434 - DIN 1164

Three gang prism mould to produce 40x40x160 mm specimens. Made from steel 55 HRB. Complete with 6 inserts. Weight: 8 Kg

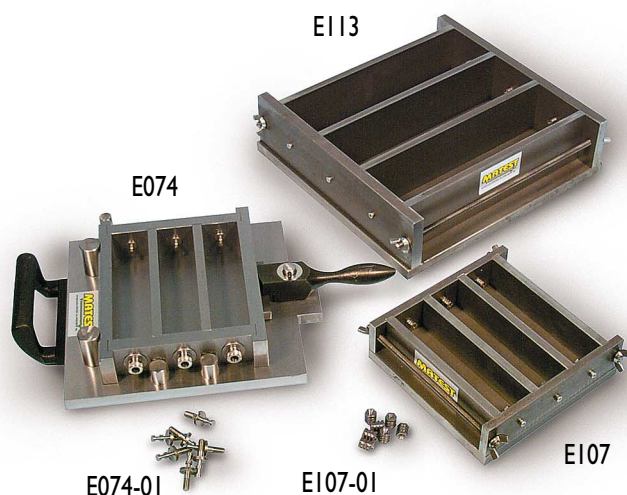
E113

STANDARD: NF P18-427

Three gang prism mould to produce 70x70x280 mm specimens. Made from steel 55 HRB. Complete with 6 inserts. Weight: 17 Kg

E107/01

Spare steel inserts for E107 and E113 moulds. Pack of 12 pieces.



E114

STANDARD: UNI 8148

Three gang prism mould to produce 80x80x240 mm specimens for the determination of restrained expansion of a concrete containing the expansive agent.

Complete with three screwed rods and six restrained end plates. Weight: 15 Kg

E114-02

Restrained end plate 80x80 mm; spare to the E114 mould.

E115

STANDARD: UNI 8147 - EN 1367-4

Three gang prism mould to produce 50x50x250 mm specimens for the determination of restrained expansion of a mortar containing the expansive agent, and the effect of the aggregates on the drying shrinkage of concrete.

Complete with three screwed rods and six restrained end plates. Weight: 10 Kg

E115-02

Restrained end plate 50x50 mm; spare to the E115 mould.

E115-01

Steel screwed rod 280 mm long; spare to the E114 and E115 moulds.



E078

Length comparator

STANDARDS: ASTM C151, C490 - NF P15-433, P18-427

BS 1881, 6073 - D.M. 3/6/68 - DIN 1164

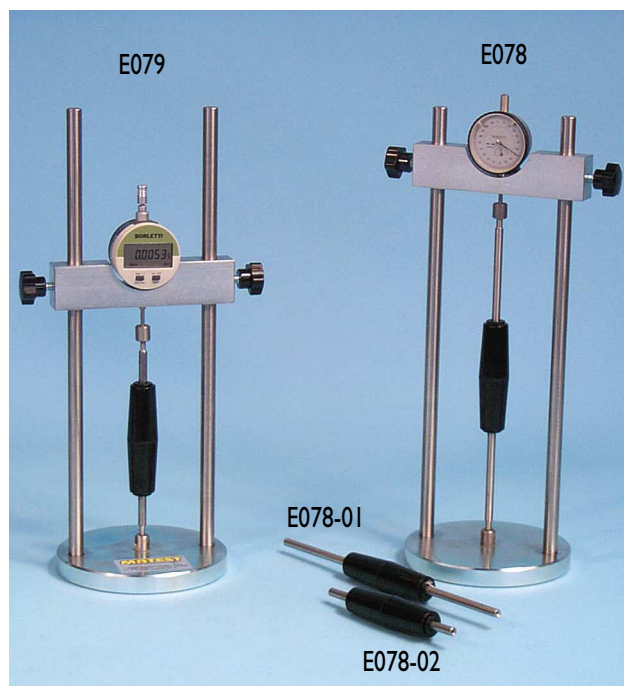
UNI 8147, 8148, 6687 - EN 1367-4

Used to measure the length variations of 25x25x250 mm cement specimens in autoclave soundness tests. It can also be used to measure linear shrinkage of specimens 40x40x160 mm, 70x70x280 mm, 50x50x250 (UNI 8147) and 80x80x240 mm (UNI 8148). The unit comprises a steel frame with an adjustable height beam fitted with a dial gauge 5 mm. travel x 0,001 mm. divisions. Supplied without reference rod.

Dimensions: dia. 180x450 mm. Weight: 10 Kg

E079

Length comparator, identical to mod. E078 but foreseen of a digital gauge stroke 25 mm. and sens. 0,001 mm., complete with battery, and RS 232 connector to PC.



ACCESSORIES:

E078-01

Reference Rod for 25x25x250 and 75x75x254 mm specimens. STANDARDS: ASTM C490 and BS 1881

E078-02

Reference Rod for 40x40x160 mm specimens STANDARDS: ASTM C348 - UNI 6687

E078-03

Reference Rod for 70x70x280 mm specimens to NF P18-427

E078-04

Reference Rod for 40x40x160 mm specimens to NF P15-433

E078-05

Reference Rod for 50x50x250 mm (UNI 8148), and 80x80x240 mm (UNI 8147) specimens



LE CHATELIER EQUIPMENT FOR SOUNDNESS OF CEMENT

STANDARDS: EN 196/3 - BS 6463 - NF P15-432 - UNE 80102
D.M. 3/6/68

The equipment is composed by:

E064

Le Chatelier water bath

Constructed with stainless steel inside chamber and exterior case in painted steel sheet, it can hold up to 12 Le Chatelier moulds (to be ordered separately) in the removable rack.

The bath reaches the boiling point in approx. 30 minutes. Now an original device keeps the bath temperature at the boiling point, by avoiding the water evaporation and assuring that Le Chatelier moulds remain covered by the water during all the test execution.

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

Dimensions: 405x265x205 mm

Weight: 7 Kg



E064
WITH E066 MOULDS

E066

Le Chatelier mould

Made from a brass spring tensioned split cylinder having internal dia. 30 by 30 mm high, with two pointers 150 mm long. Chromed finishing. Used to determine the cement expansion (soundness) either in cold and in boiling water. Weight: 30 g

E065

Le Chatelier mould individually tested

Same to mod. E066 but checked one by one with engraved a serial number for an easier identification of each mould, it perfectly meets EN 196/3 Specification.



E066-01

Glass plate 50x50 mm to cover the specimen of the mould.
Pack of 2 pieces.

E066-02

Weight: 100 g to be placed over the glass plate.

E066-03

Extensibility of mould apparatus to check the elasticity of the split cylinder of the mould. Complete with 300 g weight.

E067

Cracking test mould

STANDARD: NF P15-434

Used to produce ring-shaped specimens designed for cracking tests on hydraulic binders. This test consists of measuring the formation time of a crack on the test specimen. Weight: 8 Kg



E067

E083

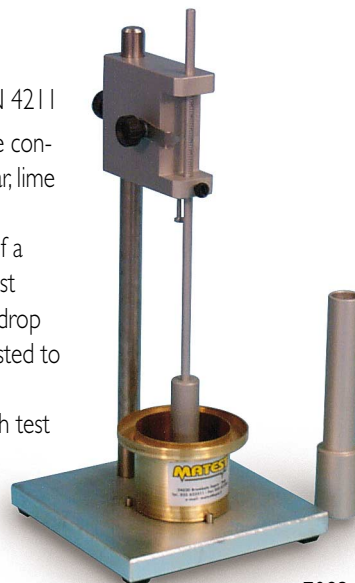
Plunger penetration apparatus

STANDARDS:
EN 413/1, 459/2 - DIN 4211

Used to determine the consistency of fresh mortar, lime and masonry cement. The base is foreseen of a device to locate the test cup. The height of the drop can be accurately adjusted to 100 mm.

Supplied complete with test cup and tamper.

Dimensions:
200x200x700 mm
Weight: 8 Kg



E083





E080

Plaster extensometer

STANDARDS: UNI 6782 - BS 1191

Utilized to measure the linear expansion of a paste of standard consistence. The expansion is measured after a period of 24 hours, during which the specimen is kept in a humidity and temperature controlled cabinet. The extensometer comprises an horizontal cradle 100 mm long x 60 mm wide x 25 mm deep closed at one end and open to the other. The open end is in contact with a dial gauge spindle, so that the lateral expansion of the specimen is measured. The dial gauge has 10 mm travel and 0,01 mm. graduation.

Dimensions: 250x80x80 mm Weight: 3 Kg



E080

E081

Mortar workability apparatus

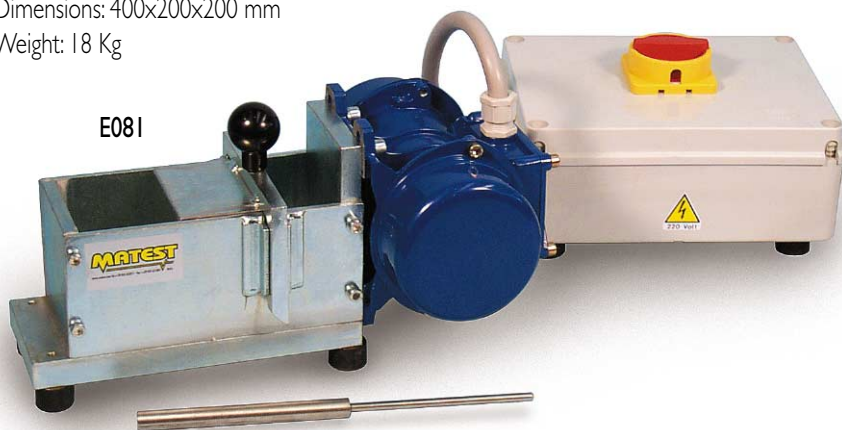
STANDARDS: NF P18-452 - EN 413/2

Designed to test concrete mortar for dynamic workability and also to ensure optimum proportioning of mortar constituents (sand, water, cement, as well as cement/sand and water/cement ratios) compatible with given application. Suitable also for checking possible improvement when admixing a plastifier, or for comparing two mortar types. The unit consists of a prismatic receiver divided into two unequal volumes by a removable partition, and by an electric vibrator. The fresh mortar is poured in the large volume place, the separating partition is removed and the vibrator starts automatically. As a result of vibrations, mortar flows from the large volume to the small one, in a time which is a function of the workability of the mortar.

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

Dimensions: 400x200x200 mm

Weight: 18 Kg



E081

E082

Pat test

STANDARDS: BS 1191, 6464:4 - EN 459/1

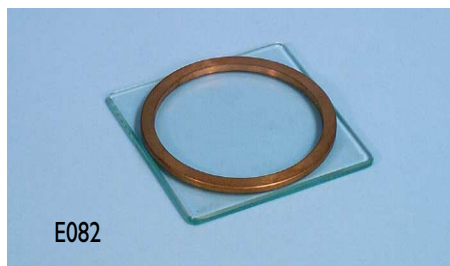
Utilized for the determination of the soundness of hydrated lime, gypsum and building plasters.

Consisting of a brass ring mould, 100 mm. diameter by 5 mm deep.

The mould has an inside taper of 5°.

Supplied complete with glass base plate.

To carry out one test, three moulds are required.



E082

E091

Bulk density of lime

STANDARDS: EN 459/2 - DIN 1060

The apparatus allows a sample to fall from a known height into a volumetric container. Consisting of a hopper, one litre cylindrical container and spring loaded trap.

Weight: 5 Kg

ACCESSORY:

E091-01

Filling ring. Weight: 1 Kg



E091

FLOW TABLES

For flow and workability tests of mortar and lime

STANDARDS: ASTM C230 - BS 4551:1 - EN 459/2 - UNI 7044 - NF P18-585 - DIN 1060 - UNE 7205, 83258

To perform this test, a specimen contained in a cone mould is placed on a metal surface which is then raised and dropped from a known height, after releasing the specimen from the mould.

The equipment consists of a circular top table with spindle, tripod, bronze flow mould and tamper. The apparatuses to EN and DIN Standards are equipped also of a filling hopper. Motorized models foresee an automatic digital drop counter.

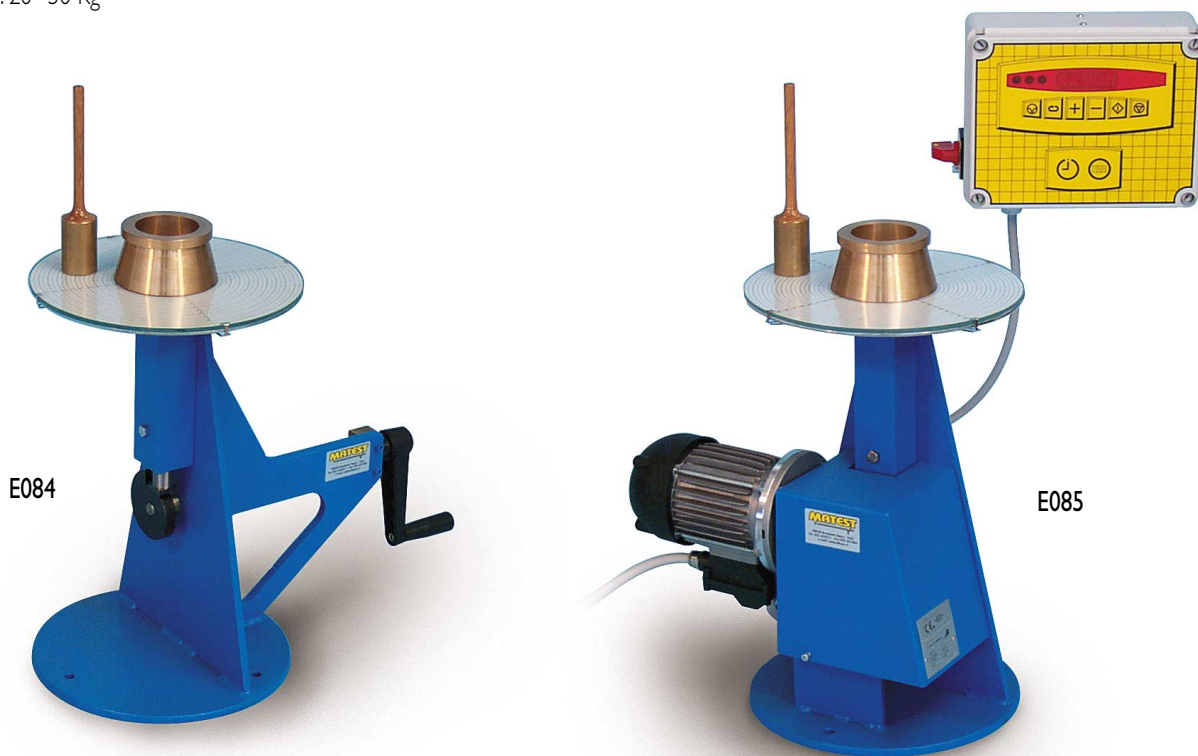
Power supply (motorized models): 220-240 V 1 ph 50 Hz 150 W

Weight: 20÷50 Kg

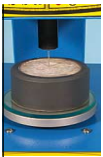
section E



156



Model	Standard	Hand Operated	Motorized	Table dia. mm	Drop height mm	Spare mould	Spare tamper
E084	UNI 7044	•		300	10	E085-05	E085-06
E085	UNI 7044		•	300	10	E085-05	E085-06
E086	ASTM C230 BS4551	•		254	12,7	E087-05	E087-06
E087	ASTM C230 BS 4551		•	254	12,7	E087-05	E087-06
E088	DIN 1060	•		300	10	E088-05	E085-06
E088-01	NF P18-585	•		250	20	E088-07	E088-08
E089	DIN 1060		•	300	10	E088-05	E085-06
E089-01	NF P18-585		•	250	20	E088-07	E088-08
E090	EN 459-2	•		300	10	E085-05	E085-06
E090-01	EN 459-2		•	300	10	E085-05	E085-06



E086

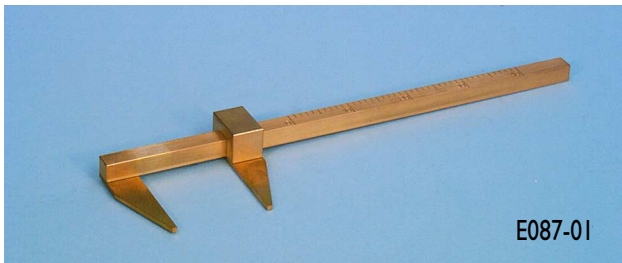


E087

ACCESSORY:

E087-01

FLOW CALLIPER to ASTM and BS Standards,
for measuring the diameter of the sample.
Weight: 450 g



E087-01



E090



E090-01

E093

Automatic mortar mixer

STANDARDS: EN 196/1, E196/3, 413/2, 459/2 - ASTM C305
AASHTO T162 - BS 3892 - NF P15-413 - DIN 1164
UNE 80801, 83258 - ISO 679 - D.M. 3/6/68

This very robust mixer is expressly designed for the efficient mixing of cement pastes and mortar; with two automatic sequences of mixing cycle, in compliance with EN 196/1 and EN 196/3 Specifications.

Bowl capacity is 4,7 litres

Two speeds can be selected:

140 or 285 rpm for the revolving action

62 or 125 rpm for the planetary action

It is possible to select the manual working, or one of the two automatic programs.

By operating automatically on changes of speed, stops and mixing sequences, outlined by acoustic signal, the unit performs the mixing cycle.

The unit is equipped of an automatic sand dispenser which fills the sand into the mixing bowl for a period of 30 seconds (only EN 196/1 program). Complete with safety door conforming to 89/392/CEE Directive; if opened it automatically stops the machine.

Supplied complete with stainless steel bowl, but without beater which has to be ordered separately.

Power supply: 220-240 V 1 ph 50 Hz

Dimensions: 340x460x700 mm

Weight: 45 Kg

section E



158

E093 + E095-03



E094

Mortar mixer

Basically similar to mod. E093, but not equipped of automatic program, sand dispenser and safety door to CE Directive. Two speeds can be selected. Supplied complete with stainless steel bowl, but without beater which has to be ordered separately. Dimensions: 340x460x500 mm Weight: 40 Kg



E094

E095

Mortar mixer

Basically similar to mod. E094, but complete with sand dispenser and safety door to 89/392 CE Directive. Two speeds can be selected. Supplied complete with stainless steel bowl, but without beater which has to be ordered separately. Dimensions: 340x460x500 mm Weight: 44 Kg

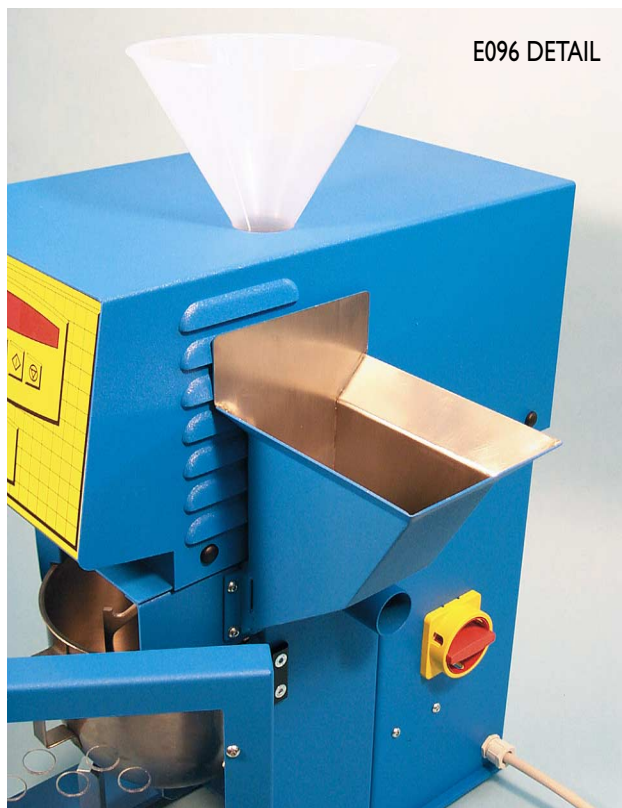


E095

E096

Automatic mortar mixer

Same to mod. E093 but equipped with duct and hopper to ease the introduction of water, additives etc. into the bowl also during the mixing phase.



E096 DETAIL

ACCESSORIES:

- E095-02** Aluminium beater with bayonet fittings
- E095-03** Stainless steel beater with bayonet fittings, to EN 196/1 Standard.
- E095-04** Stainless steel beater with bayonet fittings to EN 196/1. The beater is accurately polished to eliminate the porosities.
- E097** Reference sand, size 0,08÷2 mm to EN 196/1 Standard. Bag of 1350 g.

E095-04



SPARE PART:

- E095-01** Stainless steel bowl



E095-01

E097

E095-02

E095-03





E100

Three gang mould for prisms 40x40x160 mm

STANDARDS: UNI 6009 - D.M. 3/6/68 - UNE 80101, 83258

Made from Cr/Ni steel, hardness 60 HRC.

It is supplied complete with base, stop lever and safety catch to avoid disengagement during the Jolting operation. All parts are marked with an identification number for a correct assembling; surfaces are grinded and tolerance is held within 0,1 mm. as requested by Standards.

Weight: 12,5 Kg

E101

FEED HOPPER

Used to fill the mould E100 when it is mounted on the Jolting machine E130. Made from cast aluminium.

Weight: 1 Kg



E102

Three gang mould for prisms 40,1x40xx160 mm

STANDARD: EN 196/1

Made from steel with hardness over HV 240, it meets the dimensional tolerances of EN 196/1 Standard. All surfaces are grinded and all parts are marked with an identification number for a correct assembling. Supplied without certificate of conformity.

Weight: 10 Kg approx.

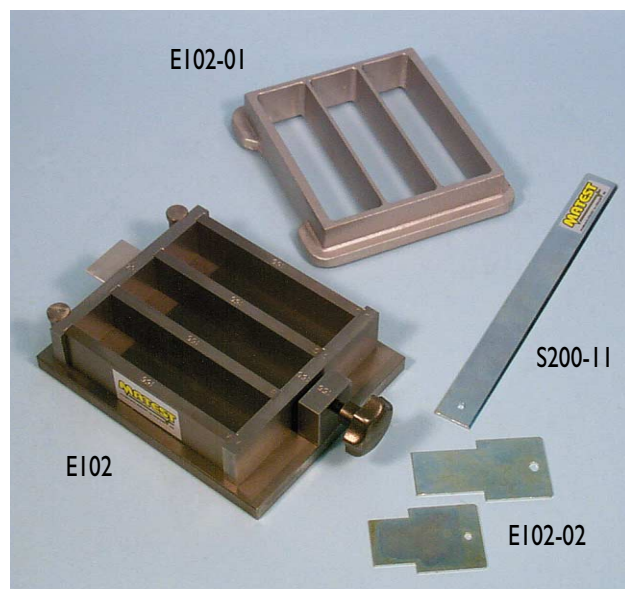
E103

Three gang verified mould for prisms 40,1x40x160 mm

STANDARD: EN 196/1

Made from steel, with hardness over HV 400 as recommended by EN 196/1. All parts are marked with an identification number for a correct assembling. Each mould is individually verified in the dimensional tolerances, hardness, squareness, flatness and roughness with instruments periodically certified by Namas Centre or equivalent. Supplied with Certificate of Conformity.

Weight: 10 Kg approx.



ACCESSORIES:

E103-01 CERTIFICATE OF VERIFICATION AND CONFORMITY of the individual mould mod. E103 issued by an Official Organisation like Namas or equivalent.

E102-01 FEED HOPPER, used to fill the mould E102 and E103 when it is mounted on the Jolting machine E130. Made from cast aluminium. Weight: 1 Kg.

E102-02 Large and small scraper to EN 196/1

S200-11 STRAIGHT EDGE 300 mm. long with one cutting rim

E102-03 GLASS PLATE 220x190x6 mm to cover the mould



E105

Three gang mould for prisms 40x40x160 mm

STANDARDS: NF P15-413 - ASTM C348 - DIN 1164, 1060

Made from steel, hardness 55 HRB, it conforms to the above mentioned Specifications.

Weight: 8 Kg

E106

FEED HOPPER

Used to fill the mould E105 when it is mounted on the Jolting apparatus E130. Made from cast aluminium. Weight: 1 Kg



E112

Three gang mould for prisms 70x70x280 mm

STANDARD: NF P18-401

Made from steel, it conforms to the above mentioned Specification.
Weight: 17 Kg

E111

Briquette mould

STANDARDS: ASTM C190, C307 - AASHTO T132

Accurately machined it conforms to the above Specifications and is easily collapsible. Complete with base.

Weight: 3 Kg

E108

Briquette mould, three gang

STANDARDS: ASTM C190, C307 - AASHTO T132

Weight: 6 Kg

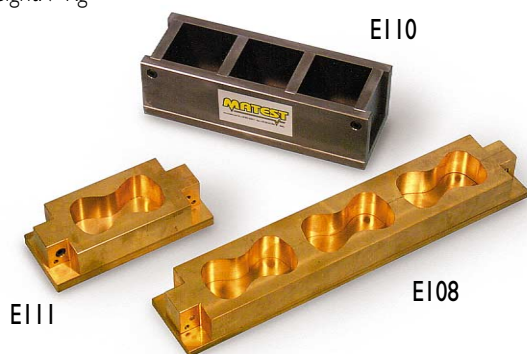
E110

50 mm three gang cube mould

STANDARDS: ASTM C109 - AASHTO T106

Made from steel, hardness 55 HRB, it can be also used for soil and other materials.

Weight: 7 Kg



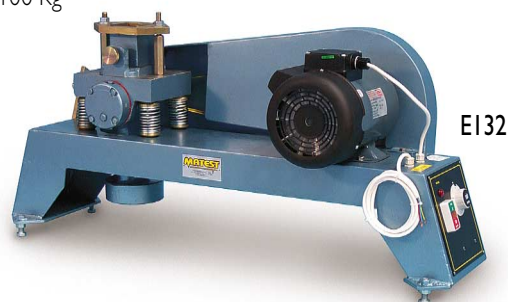
E132

Vibrating machine for 70,7 mm cube moulds

STANDARD: BS 4550

The mould is mounted on a vibration platform with excentric mechanism. The machine is supplied complete with guard, and a starter control mounted on a rigid steel frame, but without cube moulds. Power supply: 220-240V 1ph 50 Hz 250 W

Weight: 100 Kg



E130

Jolting apparatus

STANDARDS: EN 196/1 - NF P15-413 - ISO 679 - BS 3892
UNE 80101 - D.M. 3/6/68

Used to compact cement mortar prisms 40x40x160 mm in the three gang mould, as requested by the above Specifications. The apparatus, consists of a table holding the mould, seated on a rotating cam driven at 60 revolutions per minute.

The apparatus is supplied with separate control panel including main switch, automatic digital drop counter, start/stop push button.

Power supply: 220-240 V

1ph 50 Hz 500 W

Dimensions: 1000x380x420 mm

Weight: 65 Kg



E133

Cube mould 70,7 mm

STANDARD: BS 4550

Made from steel with dimensions as specified by above Standard.

Complete with base plate (three moulds required for each test).

Weight: 3 Kg



E133

E130



Thermostatic bench cabinet for curing cement, mortar, concrete specimens

STANDARDS: EN 196/1 - ASTM C109, C511 - BS 1881:111
UNE 7240 - NF P18-404

Used for curing specimens at controlled temperature both at 95% relative humidity, and in water by using suitable containers.

Temperature range from +10 to +40 °C with ± 1 °C sens.

Relative humidity: 100%

The cabinet is entirely manufactured with stainless steel 18/10

The refrigerator group and capacitors are housed in a separate compartment and mounted on sliders for an easy and simple maintenance.

The electric system is according to CEE Directive with IPX5 protection (waterproof).

The insulation is obtained by a 60 mm thick material.

Temperature is selected through an electronic digital thermostat.

An original vaporization system creates 100% relative humidity.

The upper side of the cabinet can be used as a working table.

The compartments are equipped with three sliding grids.

Sliding grids have dimensions of 325x600 mm

Useful inside height: 540 mm

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



E134

Model	Capacity Litres	No. Compart.	Overall Dimensions mm	Weight Kg	Power Watts
E134	260	2	1493x700x800	140	400
E134-01	400	3	1946x700x850	175	500
E134-02	550	4	2400x700x850	210	500

ACCESSORIES:

C303

Thermometer to record and print temperatures inside the cabinet.
See section concrete pag. 123

E134-II

Plastic pan 240x300x70 mm it accepts up to six 40,1x40x160 mm prisms for curing in water.



E134-II

WATER BATHS FOR CEMENT CURING AND GENERAL LABORATORY PURPOSE

STANDARDS: EN 196/1 - 196/8 - ASTM C109, C511

Double walled all stainless steel made with wool insulation the bath ensures a constant and uniform temperature at 20 °C with accuracy of $\pm 0,4$ °C.

Equipped with digital thermostat and electric stirrer.

The specimens are held by a shelf spaced from the bottom.

Capacity of the bath: 40 litres and over 60 specimens

40,1x40x160 mm

Inside dimensions: 510x350x230 mm

Power supply: 220-240V 1ph 50/60 Hz 2000 W

MODELS:

E136

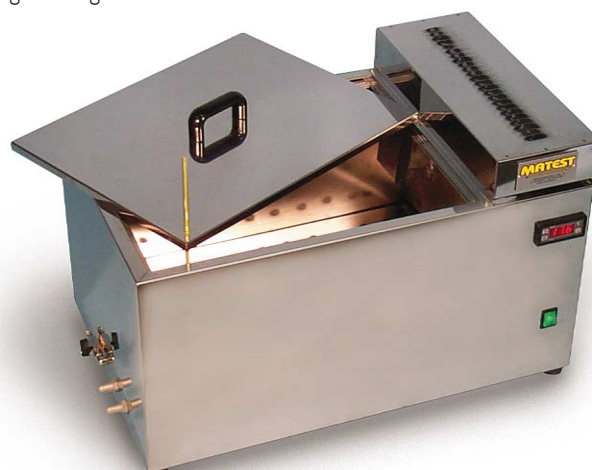
Water curing bath

Temperature range: from ambient to +99 °C with accuracy of $\pm 0,4$ °C at 20 °C.

The bath is equipped with a cooling coil device to be connected to the water net; to be used when room temperature exceeds the requested one with the possibility to reduce the bath temperature according to the room and water net temperatures.

Outside dimensions: 680x420x420 mm

Weight: 28 Kg



E136



B052-02

Water curing bath with cooling device

Temperature range: +10 to +99 °C. Accuracy of $\pm 0,4$ °C at 20 °C.

The cooling unit is housed under the water bath.

Outside dimensions: 680x420x950 mm

Weight: 60 Kg



B052-02

ACCESSORY:

E136-10

Mercury control thermometer range 0-50 °C. div. 0,5 °C.

E139

Curing cabinet

STANDARDS: EN 196/1 - ASTM C87, C109, C190, C191

Both external and internal walls are stainless steel made, and insulated by a 50 mm. thick glass wool.

The cabinet has an inner inspection glass door.

Temperature range: from ambient to 70 °C

Humidity range: 95% to saturation

Power supply: 220/240V 1ph 50/60 Hz 1000 W

Inside dimensions: 620x440x400 mm

Overall dimensions: 900x700x800 mm

Weight: 60 Kg



E139

E141

Water refrigerator

It cools the water from room temperature up to +10°C. with supply capacity of 2 litre/minute.

Stainless steel made, complete with motor pump, digital thermostat sens. 0.1°C., it is connected to water baths and tanks where a lower temperature than the room one is required.

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

Weight: 55 Kg

E138

Large capacity curing cabinet

STANDARDS: EN 196/1 - ASTM C87, C109, C190, C191 - UNE 80102

For curing large quantities of mortar and concrete specimens.

Aluminium and polycarbonate made, it is complete with electric heating resistance, precision digital thermostat and four shelves.

The saturated humidity inside the cabinet is obtained through water nebulizers activated by compressed air.

Humidity range: 95% to saturation

Temperature range: from ambient to +30 °C, accuracy ± 1 °C.

The cabinet requires a compressed air source.

Inside dimensions: 1090x470x1200 mm

Overall dimensions: 1370x540x1490 mm

Power supply 220-240V 1ph 50 Hz 2000 W

Weight: 100 Kg



E138

ACCESSORY for mod. E138:

V206 Laboratory air compressor



E141

Pull-off, bond strength

STANDARDS: EN 1542 - BS 1881:207 - ISO 4624 - NF P18-853

This dynamometer provides you with information on both the adhesive force and the tensile strength of two layers of materials: lime, facing plasters, mortars, building plasters, cements, concrete and resistance of anchoring studs.

Compact, light (3,5 Kg.), stand-alone.

Load is applied by turning the crank.

The reading is achieved through the indicator's pointer which becomes blocked at the peak level of the testing.

Models of different capacities are available and adhesion metal discs having dia. 20 and 50 mm can be used, depending to the expected pull force. The instrument is supplied without accessories to be ordered separately.

To carry out the test a common electric drill is required.



E142-03

MODELS:

E142-02 Pull-off tester 5 kN capacity, recommended for cement and plasters

E142-03 Pull-off tester 16 kN capacity, recommended for concrete

E142-04 Pull-off tester 25 kN capacity, recommended for concrete

E142-05 Pull-off tester 50 kN capacity, recommended for concrete

ACCESSORIES:

E143 Adhesion metal disc 20 mm dia. (pack of 10 pcs.)

E143-01 Adhesion metal disc 50 mm dia. (pack of 10 pcs.)

E143-02 Tungsten carbide bit 20 mm dia.

E143-03 Tungsten carbide bit 50 mm dia.

E143-04 Adhesive metolux glue 1 Kg can

E143-06 Metallic carbide bit 20 mm dia.

E143-07 Metallic carbide bit 50 mm dia.

PROCEDURE OF USE

1. Using the bit, make a round notch to the dimensions of the disc, up to the base material.

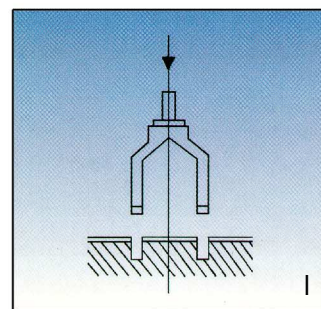
This is intended to define exactly the testing surface.

2. Stick over the surface to be tested a disc of the relevant diameter.

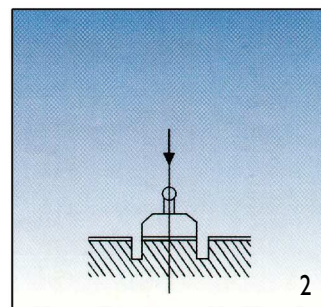
This is achieved using the adhesive metolux glue.

3. The test consists in pulling out the notched part with the instrument.

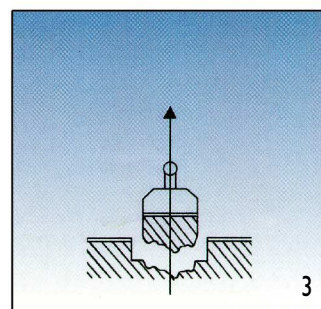
The result is provided in kN.



1



2



3



E142-02

E143-07

E143-01

E143

E143-06

E143-04



COMPRESSION AND FLEXURAL TESTING MACHINES

For cement, bricks, rock, refractories and any kind of low resistance material

STANDARDS: EN 196/1 - BS 3892 - ASTM C109 - NF P18-411
DIN 1164 - UNE 80101 - AS 2350

Designed for compression tests on cubes side 40, 50, 70, 100 mm and 2"; cores with height max. 180 mm and flexural tests on prisms 40, 1x40x160 mm by using suitable devices (see accessories mod. E170÷E172-02 described in the next pages).

Max. vertical light between platens: 185 mm.

Ram travel: 50 mm. approx.

Platens diameter: 153 mm:

Gauges dia. 200 mm.

- Range 0-300 kN subdiv. 2,5 kN

- Range 0-50 kN subdiv. 0,5 kN

Accuracy and repeatability: $\pm 1\%$ of applied load

Power supply (motorized models): 220-240V 1ph 50 Hz 750 W

Weight: 300÷330 Kg

MODELS:

E151

MACHINE CAPACITY 300 KN HAND OPERATED, ONE GAUGE.

E152

MACHINE CAPACITY 300 KN HAND OPERATED, TWO GAUGES
0-300 kN and 0-50 kN



E156 + E170

E155

MACHINE CAPACITY 300 KN MOTORIZED, ONE GAUGE complete with power control electric pump and flow control valve (variable rate of loading).

E156

MACHINE CAPACITY 300 KN MOTORIZED, TWO GAUGES 0-300 kN and 0-50 kN. Complete with power control electric pump and flow control valve (variable rate loading).

E159

MACHINE, CAPACITY 500 KN, MOTORIZED, WITH ELECTRONIC DIGITAL MEASURING SYSTEM WITH MICROPROCESSOR MOD. C099 (see section "Concrete" pag. 91)



E159 + C120 + E170 + E161-11

E159-01

MACHINE, CAPACITY 250 KN, MOTORIZED, WITH ELECTRONIC DIGITAL MEASURING SYSTEM WITH MICROPROCESSOR MOD. C099. Same to mod. E159 but with capacity of 250 kN.



EI60 + CI20 + EI6I-12



EI6I

MACHINE, CAPACITY 250 kN, MOTORIZED, CONNECTED TO THE AUTOMATIC SERVOCONTROLLED CONTROL CONSOLE WITH MICROPROCESSOR "SERVO-UNIT" MOD. C098 (see section "Concrete" pag. 91), it provides fully automatic testing through all test phases, with automatic control of load and pace rate, and the software to print out results and certificates.

ACCESSORIES:

EI6I-11

BENCH to hold the machines mod. EI51, EI52, EI55, EI56, EI59, EI59-01, EI60, EI60-01, EI61, EI81, EI81-01

Made from heavy steel sheet.

EI6I-12

Safety guards to 89/392/CEE Directive, polycarbonate made, complete with hinges and lock.

CI20

Strip printer for the machines mod. EI59, EI59-01, EI60, EI60-01, EI61, EI81, EI81-01

CI24-02

Printer, A4 format, for the machines mod. EI59, EI59-01, EI60, EI60-01, EI61, EI81, EI81-01, EI82, EI82-01

EI60

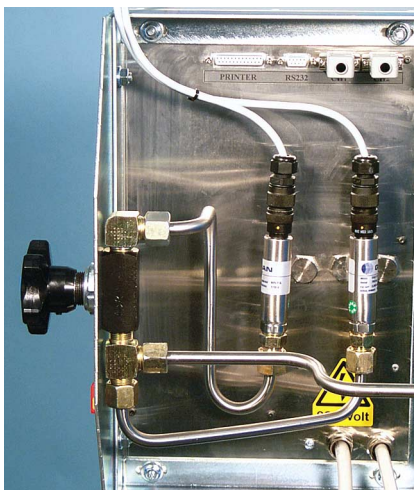
MACHINE, DUAL RANGE 500 kN AND 15 kN, MOTORIZED WITH ELECTRONIC DIGITAL MEASURING SYSTEM WITH MICROPROCESSOR MOD. C099-01 (see section "Concrete" pag. 91).

The machine is equipped with two pressure transducers for two measuring ranges: 0-500 kN and 0-15 kN.

Recommended for compression tests (by utilizing the range 0-500 kN) and flexural tests on prism 40,1x40x160 mm (by utilizing the range 0-15 kN).

EI60-01

MACHINE, DUAL RANGE, same to mod. EI60, but with MEASURING RANGES: 0-250 kN and 0-15 kN.



EI60 DETAIL

EI6I + CI20



COMPRESSION/FLEXURAL DEVICES

To be positioned between the compression platens of the machine; they fit perfectly without removing anything and without adding any distance piece.

MODELS:

E170

Compression device for portions of 40,1x40x160 mm prism broken in flexure

STANDARDS: EN 196/01 - ASTM C349 - NF P15-451

The compression platens have hardness 60 HRC and upper platen is seat ball assembled. Cadmium plated for rust protection.

Weight: 12 Kg



E170

E170-01

Compression device for portions of 40,1x40x160mm prism broken in flexure

STANDARD: DIN 1164

Identical to mod. E170 but with compression platens having 40x62,5 mm size, as requested by DIN Standards.

Weight: 12 Kg



E170-01

E171

Compression device for cube 50 mm and 2" side

STANDARD: ASTM C109

Platens diameter: 75 mm and upper platen is seat ball assembled.

This device can be used also to test cores max. 50 mm height.

Weight: 12 Kg



E171

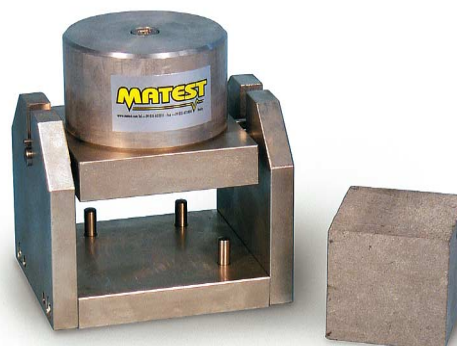
E171-01

Compression device for cube 70,7 mm side

STANDARD: BS 4550

It can be used also to test cores max. 70 mm height

Weight: 12 Kg



E171-01

E172-01

Flexure device for 40,1x40x160 mm prisms

STANDARDS: EN 196/01 - NF P15:451 - DIN 1164

Upper bearer is seat ball assembled.

The distance between lower bearers is 100 mm and one of them has a spherical seat. Cadmium plated for rust protection.

Weight: 8 Kg



E172-01

E172-02

Flexure device for 40x40x160 mm prisms

STANDARD: ASTM C348

Identical to mod. E172-01 but lower bearers have distance of 119 mm as requested by ASTM Standard.

Weight: 8 Kg



COMPRESSION/FLEXURAL TESTING MACHINES

STANDARDS: EN 196/1 - ASTM C109 - BS 3892 - DIN 1164
NF P18-411 - UNE 80101 - AS 2350

MODELS:

E181

Compression/flexural testing machine for 40x40x160 mm prisms

Technical specifications:

Dual loading chamber: Compression and Flexure

Max capacity load in compression: 250 kN

Max capacity load in flexure: 15 kN

Flexural and compression devices: incorporated in the chambers

Piston's strokes: 50 mm approx.

Dual loading chambers ranges: 250 kN and 15 kN by utilizing the digital measuring system with micro-processor mod. C099-01 (see section concrete pag. 91)

Load is measured by two electric strain cells granting high accuracy and repeatability

Accuracy and repeatability: $\pm 1\%$

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

Dimensions: 700x400x450 mm

Weight: 250 Kg approx.



E181 + C120



E181-01

Dual piston compression frame 250 kN / 15 kN capacity

Identical to mod. E181 except the compression platens that have dia. 152 mm.

The vertical daylight is 190 mm.

The low capacity piston permits very accurate tests on specimens having low strength.

The machine is supplied complete with upper seat balls, set of distance pieces, except the devices mod. E170-E172-02 that have to be ordered separately.

E181-01 + C120 + E170 + E172-01 + E161-11



E182

Compression/flexural testing machine for 40x40x160 mm prisms

Connected to the automatic servocontrolled power system (mod. C124, see section "Concrete" pag. 95) it performs a fully automatic test procedure, including speed rate and software for certificate printing.

Dual loading chamber with dual ranges: 250 kN and 15 kN

Load is measured by two electric strain cells granting high accuracy and repeatability.

Technical specifications of the frame: see mod. E181

Power supply: 400V 3ph 50 Hz 750 W

Dimensions: 1310x710x1500 mm

Weight: 310 Kg

E182-01

Dual piston compression frame 250 kN / 15 kN capacity

Identical to mod. E182 except the compression platens that have dia. 152 mm.

The vertical daylight is 190 mm

The low capacity piston permits very accurate tests on specimens having low strength.

The machine is supplied complete with upper seat balls, set of distance pieces, except the devices mod. E170÷E172-02 that have to be ordered separately.



E182



E182-01

ACCESSORIES:

C120

Strip printer to mod. E159, E159-01, E160, E160-01, E161, E181, E181-01 machines

C124/02

Printer, type A4 format to mod. E159, E159-01, E160, E160-01, E161, E181, E181-01, E182, E182-01 machines

E161-11

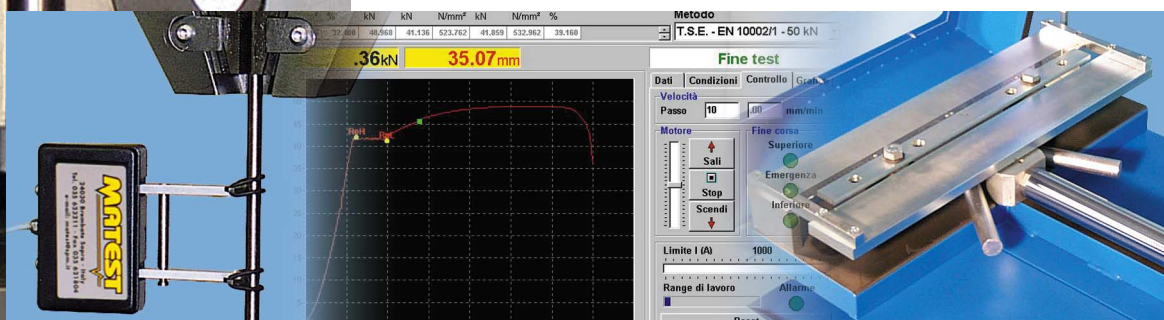
Bench to hold the machines mod. E151, E152, E155, E156, E159, E159-01, E160, E161, E160-01, E181, E181-01

Made from heavy steel sheet.

Section H STEEL

In this section Matest proposes a wide range of universal electromechanical and hydraulic machines to perform tensile, elongation, flexural, bending, resilience tests on metallic materials, with the possibility to extend these test applications on plastics, rubber, composed materials, wires, ropes, paper, textiles etc.

This range of machines satisfies both control tests on steel bars for reinforced concrete, and quality tests in the iron metallurgy, metals, plastics etc.



Index section

STEEL

	Mod.	Page		Mod.	Page
Accessories for electromechanical machines.....	H005-11/H008-44 ...	182	Impact pendulum tester	H060.....	183
Bath, cooling for resilience tests.....	H052.....	185	Marking-off machines.....	H020.....	183
Bending machine	H065.....	186	Modem for connection to telephone net.....	H009-02.....	181
Bending test on metals, accessory.....	H003-12.....	173	Pendulum impact resilience tester	H060.....	183
Broaching machine.....	H057.....	183	Personal Computer for universal testing machines.....	H009-01	181
Charpy, pendulum impact tester	H060.....	183	Printer for universal testing machines.....	H009-03.....	181
Compression test on concrete, accessory.....	H003-21	173	Resilience test: pendulum impact tester	H060.....	183
Compression test on metals, accessory.....	H003-13.....	173	Software for universal testing machines	H009.....	177/180
Cooling bath for resilience test	H052.....	185	Tensile, universal testing machines.....	H003/H008.....	172/176
Cutting machine	C351	187	Universal electromechanical servocontrolled machines from 10kN to 600kN	H004/H008.....	174/176
Dry-ice maker.....	H050.....	185	Universal hydraulic servocontrolled machine 600kN.....	H003.....	172/173
Electro-welded wire net test, accessory.....	H003-14.....	173	Universal Tensile/Compression machine: 300kN - 1500kN.....	H010/H011	184/185
Extensometers, electronic.....	H014.....	181			
Flexure test on concrete, accessory	H003-22.....	173			
Flexure test on metals, accessory.....	H003-11	173			



H003

Universal hydraulic servo-controlled machine 600 kN capacity with computerized control system, to carry out static tensile tests on metallic materials

STANDARDS: EN 10002 - ASTM A370

It basically consists of:

- Strong loading frame with a reading cell built into the piston
- Hydraulic servo-controlled unit, complete with Personal Computer for the data acquisition, control and processing. The whole is built in a console.

The frame is designed to carry out tensile tests using the grips placed in the clamping heads. In the upper part, between the head and traverse, it is possible to carry out flexion, compression, bending, hardness, dishing tests, according to the International Standards by using the suitable (see accessories) devices.

The hydraulic servocontrolled unit regulates the load rate by the Computer. An emergency device stops the machine in any moment as per the International Safety Standards.

A control pedal situated on the frame governs the movement of the lower tensile head for an easier positioning of the specimen according to its length. The machine is supplied complete with loading frame, control console and bed frame, while the software (mod. H009), the PC (mod. H009-01), the modem (mod. H009-02), the extensometer (mod. H014 and H014-01) the grips and the printer are options and must be ordered separately according to the needs of the user.

TECHNICAL FEATURES:

Capacity	600kN
Max. crosshead stroke	200 mm
Max. distance between the jaws.....	465 mm
Width flexion joke	190 mm
Max. distance between Flexion knives.....	1000 mm
Distance between Compression plates.....	235 mm
Load reading.....	Sensing by loading cell. Resolution 0,01% U.V.
Accuracy.....	Class I EN 10002/2 Only reading scale 1:1-1:20 U.V.
Stroke reading	Sensing by linear transducer Resolution 0,01 mm
Deformation reading.....	Sensing by electronic extensometer Resolution 0,001 mm
Accuracy.....	Class B 2 (B 1 for base up to 50 mm) ASTM E83
Needed height	3900 mm
Frame weight	2600 kg approx.
Rack dimensions.....	610x630xh.1600 mm
Power supply	400V 3ph+Neutral+Earth 50 Hz 2 kW



H003

ACCESSORIES FOR MOD. H003:

ROUND AND FLAT GRIPS. One set consists of two double pairs that must be placed into the upper and lower tensile heads.

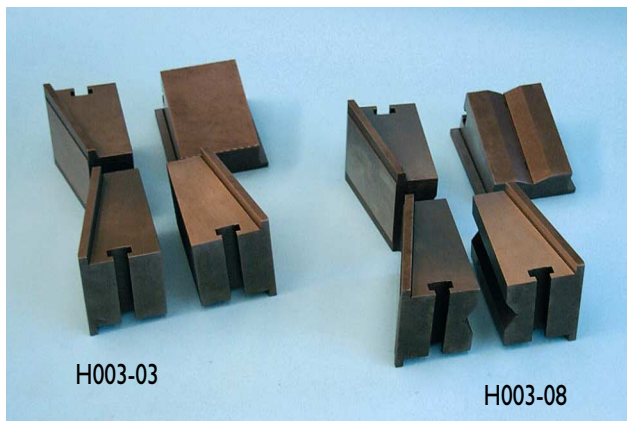
H003-03 Set of Grips for Flat specimens $2 \div 18$ mm and Round specimens dia $5 \div 12$ mm

H003-04 Set of Grips for Flat specimens $18 \div 36$ mm

H003-07 Set of Grips for Round specimens dia. $12 \div 24$ mm

H003-08 Set of Grips for Round specimens dia. $25 \div 40$ mm

H009-03 Graphic Printer A4 format, for the printing of the test Diagram or Certificate.



NOTE: for the software (H009), the PC (H009-01), the modem (H009-02) and the extensometer (H014 and H014-01) see next pages.

ACCESSORIES FOR TESTS ON METALS:**H003-11 Flexure test**

STANDARD: UNI 559

The equipment is composed by a couple of lower bearers with adjustable supports and an upper blade.

Maximum load: 200 kN

Maximum distance between the lower bearers: 1000 mm

Width of the bearers: 120 mm

Diameter of the bearers: 50 mm

Weight: 70 Kg

**H003-12 Bending test**

STANDARDS: UNI 564 - ASTM E290

The equipment is composed by a couple of lower bearers with adjustable supports and an upper blade.

Maximum load: 200 kN

Maximum distance between the lower bearers: 1000 mm

Width of the bearers: 120 mm

Diameter of the bearers: 50 mm

Weight: 70 Kg

Note: bearers with different diameters are available on request.

H003-13 Compression test

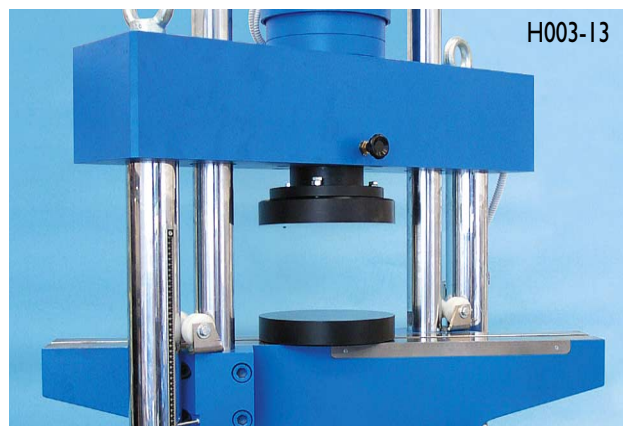
STANDARD: UNI 558

The equipment is composed by an upper plate with seat ball assembly and by a lower plate.

Maximum load: 600 kN

Diameter of the compression plates: 90 mm

Weight: 25 Kg

**H003-14 Test on electro welded wire nets**

Device for the seizing of electro welded wire nets; this equipment must be used with the grips for flat specimens.

Weight: 5 Kg

ACCESSORIES FOR TESTS ON CONCRETE:**H003-21****Compression test** on concrete specimens

The appliance is composed by:

An upper compression plate 287 mm. diameter complete with seat ball assembly. A lower compression plate 287 mm. diameter

Maximum distance between the compression plates: 185 mm.

Weight: 60 Kg

H003-22**Flexure test** on concrete beams with dimensions 100x100x400/500 mm. and 150x150x600/750 mm.

Composed by two lower and one upper bearers

Maximum load: 200 kN

Maximum distance between the lower bearers: 1000 mm.

Width of the bearers: 160 mm.

Weight: 40 Kg

Servo-controlled electromechanical universal testing machine

This appliance is designed to be used in Laboratories for Quality Control and Research on Metals, Plastics, Composed Materials, Wires, Ropes, Paper, Textiles etc.

The machine is suitable to make tensile and elongation tests on different materials following the EN 10002 and ASTM A370 Standards.

section H

The machine is composed by a strong base containing the transmission components and the Hardware control instruments.

The base carries two columns that guide the cross-bar; they are made of high resistance steel with ground hard chrome surfacing.

The big diameter and the position where the columns are fitted grant a high lateral rigidity. The system is suitable to realise both tests with single direction or dual direction.

In order to grant no clearance, the transmission of the movement to the mobile cross-bar takes place through two re-circulating spheres screws with pre-loaded female screws.

High attention is given to the assembling system of the screws and their groups - bearings put in the base and in the upper head.

The mobile cross-bar with big section together with all other elements of the machine being properly dimensioned grant a very good "Rigidity of the machine" (see UNI ISO 5893 Standards).

The moving up and down of the cross bar on the columns happens

through sintered bushes with low friction coefficient.

On the mobile cross-bar there are some holes for the mounting of the load cells.

The Load Cell is made in stainless steel and reads both tensile and compression loads with a very high precision.

It is in conformity with the EN 10002/2 Standards.

Features of the load cell referred to ISO 376 Standards.

Accuracy class..... I

Repeatability error $\leq \pm 0.145\%$

Interpolation error $\leq \pm 0.090\%$

Error on zero $\leq \pm 0.03\%$

Reversibility error $\leq \pm 0.240\%$

Non linearity error $\leq \pm 0.04\%$

Maximum overload capacity 200%

In order to follow the specific needs of each single application, different load cells with different capacities within the nominal capacity of the machine can be installed on the frame.

Different connections for the installation of the seizing devices are on the mobile cross-bar and on the base (see accessories at following pages).

The machine is delivered with different safety devices limiting the maximum travel of the cross-bar. There is also an adjustable device that allows setting a personalised upper and lower travel limit following the used appliances.

The control section is made by a series of cards inside the base of the machine that are managing the control units and the reading units positioned on the machine.

The acquisition card, with a powerful microprocessor and converter AD 24 bits, takes all the working dates and through a RS232 connection it sends all these dates to the Personal Computer, which controls all the functions of the machine and makes the elaboration of all the calculations through the program UTM WIN.



H007

On the base there are:

A device which allows an easy and speedy positioning of the mobile cross-bar.

A push button to interrupt the test execution at any time.

A series of connectors for the connection to the control PC and to the auxiliaries appliances (extensometer; load cells etc.)

General switch/Safety switch.

The frames protecting the columns and the screws are made of anodised aluminium, the internal sides are closed with anti-dust bellows and all the outside and internal parts are properly treated against the corrosion.

Following equipments are not delivered with the machine and have consequently to be ordered separately (see following pages):

- Personal computer model H009-01 (indispensable for the working of the machine).
- Standard UTM WIN software model H009 (indispensable for the working of the appliance).
- Modem and software model H009-02 for the connection to the telephone net and the servicing through it.
- Special personalised programs (following the customer demand)
- Accessories for the seizing of the specimens.
- Printer model H009-03
- Extensometer model H014 and H014-01
- Other accessories



H004



H005



175



AVAILABLE MODELS:

MODEL	H004	H005	H006	H007	H008
LOAD					
CAPACITY kN	10	50	100	200	600
TEST					
SPEED					
mm/min					
Minimum	0,01	0,01	0,01	0,01	0,01
Maximum	500	500	500	480	300
POSITIONING					
SPEED					
mm/min.	500	500	500	480	300
CROSS BAR					
TRAVEL					
(*) mm	1130	1130	1180	1150	1320
OPENING OF THE					
TESTING CHAMBER					
Vertical mm (**)	1253	1251	1310	1280	1580
Horizontal mm	421	421	600	600	720
MAXIMUM DISTANCE					
BETWEEN THE TENSILE					
HEADS mm (***)	630	612	510	480	550
DIMENSIONS mm					
height	1708	1845	2340	2340	3000
width	550	810	1370	1370	1420
depth	683	670	700	700	900
WEIGHT Kg	250	370	1000	1150	2600
POWER SUPPLY	230V 1ph 50 Hz	230V 1ph 50 Hz	400V 3ph 50 Hz	400V 3ph 50 Hz	400V 3ph 50 Hz
ABSORBED					
POWER W	1000	1200	2000	3000	3000

(*) The cross bar travel is referred to the distance between the upper surface of the base and the lower surface of the cross bar and it doesn't include the load cell, the seizing devices, the different equipments etc.

(**) The vertical opening of the testing chamber is the distance between the upper surface of the base and the lower surface of the crossbar, without load cells, seizing devices and other devices.

(***) The maximum distance between the tensile heads is the distance between the grips when the crossbar is at its upper dead point (load cell is installed). Practically it is the free length of the specimen between the tensile heads.

- The voltage must not have peaks of tension, over-tensions and transitory over-currents or drops of voltage higher than 10% of the nominal voltage.
- Working temperature from +10° C. up to +38° C.
- Humidity range from +10% up to +90%, without condensation.

H005-01

Servo-controlled electromechanical universal testing machine (special model)

Load Capacity: 50 kN

This machine has same technical specifications of the standard model H005 except:

- Cross bar travel is: 1780 mm
- Vertical opening of the testing chamber is: 1904 mm
- Maximum distance between the tensile heads is: 1200 mm
- Overall height dimension is: 2450 mm

This machine has been expressly produced to test materials having very high tensile elongation percentage (ex. plastics, rubbers etc.).

The machine complies with the Standards on Plastics: EN-ISO-UNI 527, 1, 2, 3.



H005-01



ACCESSORIES FOR MODELS H003 TO H008

H009

SOFTWARE

The UTMWIN program has been realised following the Microsoft Windows operating system.

The conception and the graphical interface of the program, together with the menus layout made to guide the operator throughout the test preparation and its execution, allow a rapid and precise use of the machine; they also grant reliable and trustworthy results which reduce the possibility of mistake.

The main characteristics of the program are:

Possibility to work in Operator or in Administrator mode

The access to the parts of the program allowing the setting of the working characteristics of the machine and of its calculation and data correction facilities is permitted only in "Administrator" mode. The "Operator" mode allows only to enter to the test execution functions. These are strictly connected to the setting applied in "Administrator" mode.

These two setting levels will give the possibility to the "Manager" of the laboratory to set the conditions of a test method in "Administrator" mode. In "Operator" mode he will have the guarantee that these conditions will be totally followed and observed.

The access to the "Administrator" mode is protected by a password.

Modules structure for the creation of "setting models"

The program is composed by modules.

The combination of the different modules gives the possibility to create personalised "setting models".

The creation of a "setting model" is the definition of a procedure which allows the automatic control of the whole test cycle, starting from the introduction of the specific dates concerning the specimen checked up to the printing of a personalised certificate.

Each "setting model" is identified by a title which can be given by the "Administrator".

When a title is chosen, all the functions of the machine previously decided in the corresponding "setting model" will be activated.

This procedure allows to create an unlimited quantity of personalised test methods; it has the advantage to make the test execution extremely easy; in addition to this, the test execution will correspond to the setting of the "Administrator".

Each module is characterised by an easy user interface, which is complete and allows to both the Administrator and the Operator to introduce and set easily and immediately all the parameters of a specific test.

The program is anyway installed and delivered complete with preset configuration of the methods required by the Customer.

Conformity of the basic software to EN 10002 Standard

The program complies strictly with EN 10002 Standards.

All the symbols and the units of measure used are referring to the EN 10002 Standard.

This allows the Administrator to set test methods perfectly complying to this Standard; consequently these will be suitable to the specific requirements of the EN 9000 Standards

By creating different "setting models", the Administrator will anyway have to consider the specific standards referred to the product he is testing in order to introduce the proper test procedures.

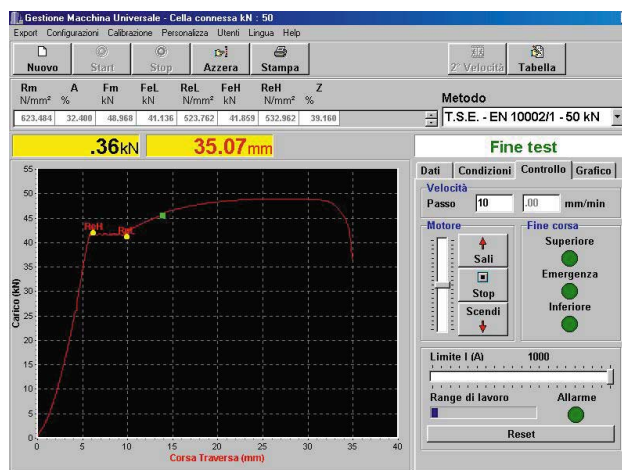
DESCRIPTION OF THE MAIN CONTROLS

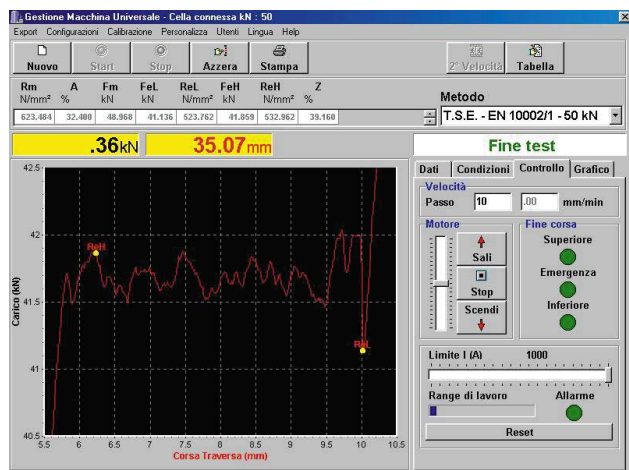
Main Screen

The main screen of the program represents the main interface with the Operator during the tests execution.

It is made by a graphical window clearly containing the data and the specific informations about the test being run. The main data are:

- Control buttons of the machine functions.
- Value of the applied load to the specimen in real time (the identification of the installed load cell is completely automatic)
- Value of the specimen deformation in real time.
- Value of the specimen deformation taken by the extensometer eventually used in real time.
- Load - Deformations diagram with the possibility to change the scales and to zoom in real time (during the test execution).
- Control in real time of the diagram load - deformation characteristics and of their identification symbols (speed change indicator; yield points markers, Rp markers etc.)
- Visualisation of the set method.
- Visualisations of the sizes to calculate at the end of the test with corresponding measuring units.
- Visualisation of the specimen dimensions and features.
- Visualisation of the setting conditions of the machine (Limits, Thresholds, etc.)
- Signalling of the safety devices intervention and condition (travel limit, alarm, overload protection once the maximum load capacity of the cell has been reached, etc.)
- Controls for the position correction of the yield points and Rp markers (only in "Administrator" mode).





Menu "NEW"

The menu NEW allows to introduce the parameters for the execution of a test.

By activating this control, a screen containing a series of cells, where a series of dates and parameters can be introduced, will appear; these dates refer all to the test that is going to be executed.

Here below we give the main fields with a short description of their functions.

Test code Identification of the test and saving in the File section.

Date, Time Possibility to confirm the date and time proposed or to modify them.

Kind of specimen Selection for the kind of specimen from the list previously memorised. Following the kind of specimen the program will ask the different characteristic dimensions.

So Visualising of the starting section of the specimen calculated by the program.

Lo Introduction of the starting length between the reference points. (*)

Le Introduction of the base length of the extensometer. (*)

Lc Length introduction of the calibrated part. (*)

Proportionality of the specimen

This section allow the proportionality definition or not between the specimen section and its starting length between the references. Its indication gives the possibility to obtain the right symbols about the percentage extension (ex : A , A 11,3 , A 80 mm)

Speed 1 Introduction of the starting speed used during the test. (*)

Speed 2 Introduction of the eventual second speed used during the test. (*)

Method It visualises the selected method

Notes Introduction of eventual notes/comments

Operator Introduction of the Operator's name

Responsible Introduction of the Manager's name

(*) The value eventually given in the chosen method will be proposed.

Conformity of the base Software to further Standards

In addition to the EN 10002 Standard the program is made in order to comply with many other standards, all the symbols, the calculations formulas, the measuring units used and the setting of the methods are strictly in conformity with the specifications given by the main standards.

List of the most important standards:

EN 10002/01	Metallic materials. Tensile Test.
EN ISO 527	Plastic materials. Determination of the characteristics under traction.
EN ISO 604	Test on plastic materials. Determination of the properties under compression.
EN ISO 10319	Geo-textiles. Tensile test with large band.
UNI 8202/8	Membranes for waterproofing. Determination of the resistance under traction strength.
UNI 8202/9	Membranes for waterproofing. Determination of the resistance to tearing.
UNI 8639	Test on cloths not weaved. Tensile test, method on strip.
UNI 8279/4	Not weaved. Tensile test, Grab method.
UNI 8279/9	Not weaved. Determination of the resistance at the tearing.
UNI 8279/14	Not weaved. Determination of the resistance to the punching and of the deformation at the Breakage.
CNR 142	Geo-textiles. Tensile test on not weaved geo-textiles.
CNR 143	Geo-textiles. Determination of the resistance to tearing

"Methods configuration" Menu

The METHODS CONFIGURATION menu gives the possibility to create the methods.

The creation of a method allows to fix and personalise the tests execution; a series of parameters and settings will be fixed and these will be automatically recalled and proposed when the method is started.

The operator interface is made by a screen containing a series of fields where the values have to be introduced. Here below we give the main fields with a short description of their functions.



- Description** Introduction of the "Title" and the method will be identified.
- Speed 1 and 2** In these fields we shall introduce the two speeds, which will be used during the Test.
The first speed will be used in the moment when the test is started through the START button and it will continue up to the end of the test or up to the moment when the Operator starts the second speed through the specific button (for example when the test goes from the elastic phase to the plastic one).
For both the speeds the measuring unit must be selected and the wished value must be introduced in the relative field.
- Lo** Introduction of the starting length between the reference points.
- Le** Introduction of the base length of the extensometer.
- Lc** Length introduction of the calibrated part.

Calculations folder

The calculations that the program must execute are fixed in this folder:

In the program there are some folders, named with the number of the Standard they refer to; these folders have all the required formula for the execution of the operations.

The Administrator has to select the formula he wants to use, when he is arranging the methods; he will decide the calculations the program will execute and the results.

In addition to above there is a diagram for the graphic analysis, which allows introducing the load values and to obtain the relative deformation values, or vice versa.

Conditions folder

In this folder a series of parameters are introduced and they allow to control the working of the machine:

Load limit Introduce the load value that must not be exceeded. During the test execution the machine will automatically stop the working once this load has been reached.

Travel Limit Introduce the travel value that must not be exceeded. During the test execution the machine will automatically stop the working once this travel has been reached.

In addition to above the user can decide a procedure to reach a determinate load at a certain speed, keep this load for a determinate period and, at the end of this time, a second determinate speed will start.

The user must introduce:

- The speed to reach the load
- The load value
- The time the load has to be kept
- The speed the test must continue.

Menu to "Personalize the report"

The menu to PERSONALIZE THE REPORT gives the possibility to personalise the dates which are in the test report. As test report we intend the screen (and its printout) that contains the data, the calculations and the graph of a test (certificate).

The report contains three lines that can be personalised and cover the width of the page together with a series of fields that can be named by the Administrator with a title chosen by himself.

This configuration together with the relative titles of fields will be automatically proposed again in the screen "New" opened after the selection of the method this specific report has been joined.

Each report must be joined to a denomination, which permits its identification and its selection.

The part of graph that has to be put on the report can be decided by the Operator before the printout.

A series of reports having different graphs or portions of graphs can be printed out.

The report personalisation allows to give the dimensions for the printing out on the User's letterhead.

"Recording" Menu

The RECORDING menu allows to memorise on the HD of the PC all the reports that have been created.

The system manages the recording in Files, following the operative system of Windows and granting all the advantages of the system.

The report that has been saved can be recalled and printed out (without the possibility to modify them).

In addition to the reports the graphs can be saved in ".bmp" format.

This gives the possibility to export the graph in a video-writing program, in an electronic file or in a program for the graphic management in order to make further drafting.

“Manual control” Menu

The MANUAL CONTROL menu gives the possibility to manage the machine and, consequently, to make a test in manual mode. The manual control of the machine gives the possibility to the operator to control immediately the machine; it is particularly useful when particular tests are executed, or during the calibration procedure or during the checking of the calibration.

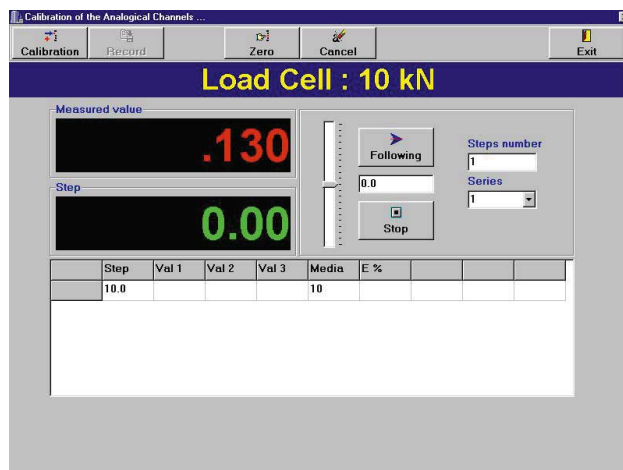
“Calibration” Menu

It contains a series of screens that give the possibility to make the calibration of the machine

“Telephone servicing” Menu

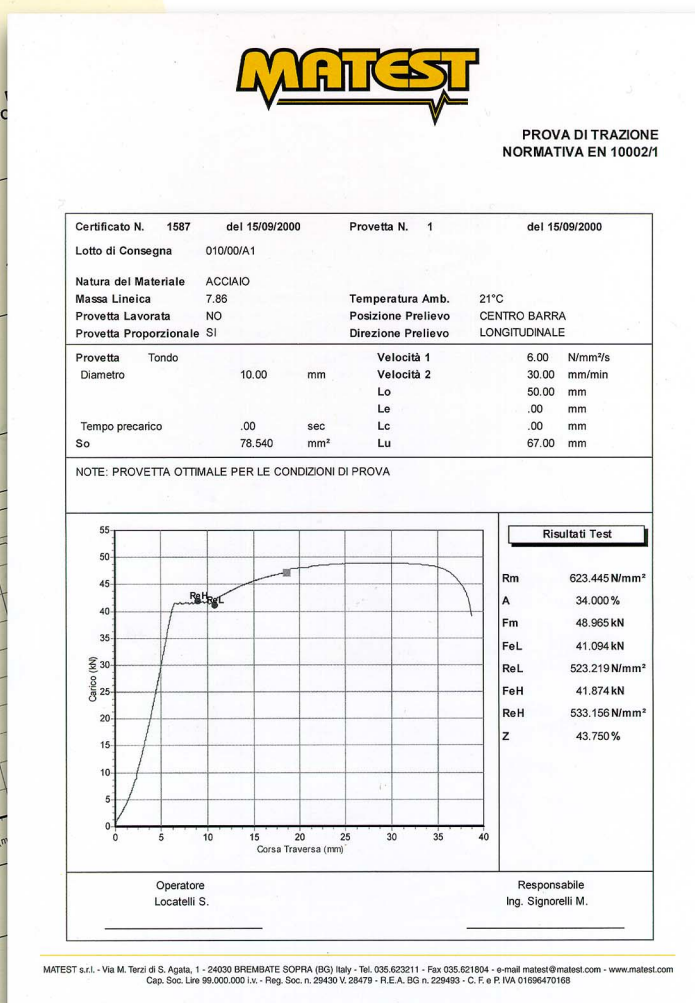
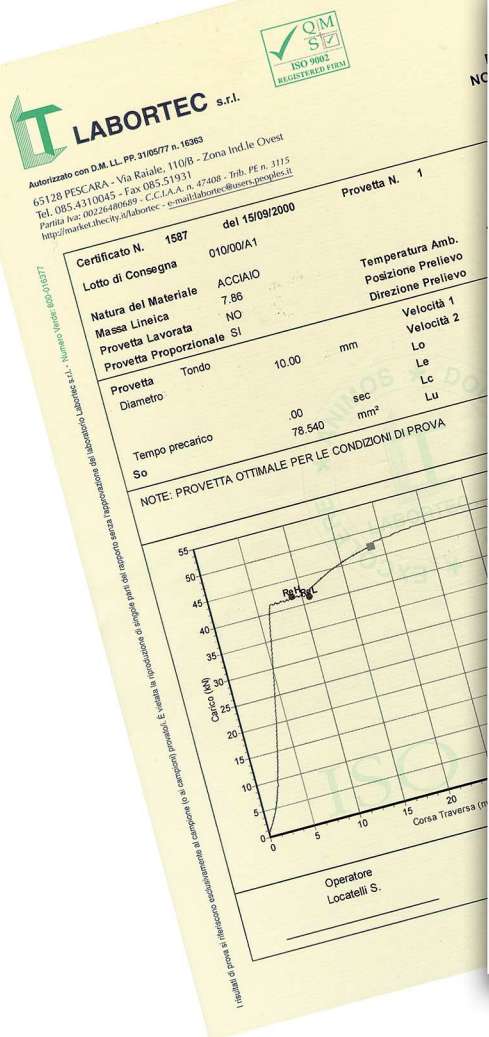
The TELEPHONE SERVICING menu together with the modem installed in the PC controlling the machine give the possibility to have the service directly from MATEST through the telephone net. This service grants a timely servicing from the technical staff, if the customer finds some problems after he has created some methods or configurations particularly complicated.

The remote control gives the possibility to check periodically the working conditions of the machine with very low costs for the end user.



APPLIED PROGRAMS

In combination with the basic program UTM WIN a series of standard or personalised Applied Programs are available; these can eventually satisfy some specific needs of the user.

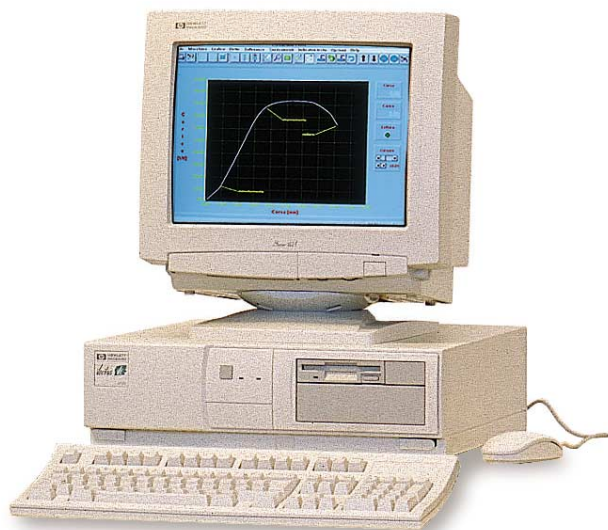


ACCESSORIES FOR MOD. H003 TO H008**H009-01**

PERSONAL COMPUTER complete with colour monitor, keyboard, mouse, connection cables.

The supply of the PC includes the installation of the software purchased together with its setting up.

In case the PC is supplied by the user, the trade mark together with the characteristics of the PC must be agreed with MATEST and the installation together with the setting up will be quoted separately.

**H009-01****H009-02**

MODEM for the connection to the telephone net for the servicing of the machine through the net.

It gives the possibility to send to the end user the updating of the programs, the corrections to it, some special settings required, etc. In addition to above it gives the possibility to service the software without requiring a direct visit on site by the technical staff with consequent spare of time and costs.

The customer must connect the machine to the telephone net without going through an internal telephone exchange.

H009-03

GRAPHIC PRINTER, A4 format, for the printing of the test diagram or certificate.

H014**H014****Electronic extensometer**

Measuring base 50 mm, Deformation range +1 mm / -0.2 mm
Maximum percent measurable deformation: +2%

It gives the possibility to take the longitudinal deformations of the specimen during the tensile test. A graph load/deformation is obtained and from this graph the coefficient of elasticity together with the loads $RP0.1$ - $RP0.2$ - RtI can be identified even on materials that are not presenting a yield point that can be clearly identified. The appliance is delivered complete with connection cables.

H014-01**Universal electronic extensometer**

To take the longitudinal deformations in conformity with ISO 9513 Standard in the Repeatability and Precision class. It is particularly easy to use with a speedy and precise fixing system on the specimen and it is simple and practical to be used.

It can be used in many fields on specimens with different features and dimensions.

The extensometer can stay fitted on the specimen until it breaks in most of the testing conditions.

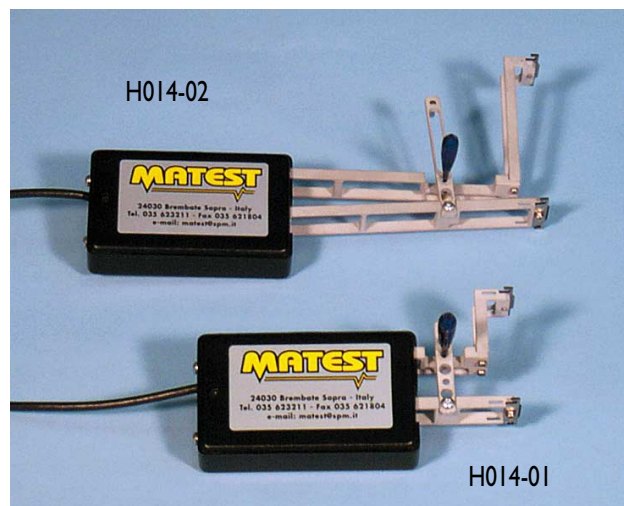
Measuring base 50 mm

Travel: +5 mm / -5 mm with safety mechanical system to stop it at its travel limit.

Feeding: 5V RMS, DC

Sensitivity: 3 mV/V

Nominal electric resistance: 350 OHM

**H014-02****Universal electronic extensometer**

Similar to the model H014-01 but with
Measuring base 80 mm. Travel: +40 mm / -4 mm

To grant a better and complete service to the Customer, Matest can supply all the Universal Testing Machines, both Hydraulic and Electromechanical, Calibrated by an Official Calibration Institute (SIT Centre), with relevant Calibration Certificate.

H009-10

Calibration Certificate for One Cell, issued by an Official Calibration Institute (SIT Centre)

**181**



ACCESSORIES FOR:

MACHINE CODE	H004	H005	H006	H007	H008
CAPACITY	10 kN	50 kN	100 kN	200 kN	600 kN
Tensile heads	H005-11	H005-11	H007-11	H007-11	H008-11
Flat seizing grips for specimens as follows:					
Flat spec. thickness 0 ÷ 10 mm					
Width max 25 mm					
Round specimens Ø 3 ÷ 5 mm	H005-21	H005-21			
Flat spec. thickness 0 ÷ 10 mm					
Width max 50 mm					
Round specimens Ø 3 ÷ 10 mm			H007-21	H007-21	
Flat spec. thickness 11 ÷ 22 mm					
Width max 50 mm			H007-22	H007-22	
Flat spec. thickness 0 ÷ 12 mm					
Width max 70 mm					
Round specimens Ø 3 ÷ 10 mm					H008-21
Flat spec. thickness 12 ÷ 24 mm					
Width max 70 mm					H008-22
Flat spec. thickness 24 ÷ 36 mm					
Width max 70 mm					H008-23
"V" shape seizing grips for round specimens:					
5 ÷ 12 mm Ø	H005-31	H005-31			
11 ÷ 18 mm Ø			H007-31	H007-31	
18 ÷ 25 mm Ø			H007-32	H007-32	
25 ÷ 32 mm Ø			H007-33	H007-33	
11 ÷ 22 mm Ø					H008-31
23 ÷ 34 mm Ø					H008-32
35 ÷ 45 mm Ø					H008-33
45 ÷ 55 mm Ø					H008-34
Compression device	H005-41	H005-41	H007-41	H007-41	H008-41
Knurled roller clamping device	H005-42	H005-42			
Device for test on wire and ropes	H005-43	H005-43			
Flexural and bending device in three spots	H005-44	H005-44	H007-44	H007-44	H008-44
Device to centre the specimens	H005-51	H005-51	H005-51	H005-51	

H005-11 - H007-11 - H008-11

Couple of tensile heads with different capacities. They are made of treated steel carefully worked and have a shape, which is granting an auto-tightening of the seizing grips on the specimen. A screw device allows the right operation of the seizing grips and grants a right blocking of the specimen starting from the lowest loads and reducing at the top the moving of the crossbar during the penetration of the knurling on the specimens. Each couple of tensile Heads is delivered complete with:

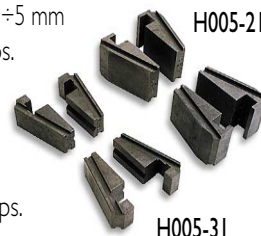
- Couplings for the installation on the machine
- Spanner for the assembling and the disassembling of the seizing Grips
- Pack of special grease for lubrication

**H005-21**

Flat Grips - Thickness 0 ÷ 10 mm
Width max 25 mm and Round Grips dia. 3 ÷ 5 mm
One set consist of a double pair of grips.

H005-31

Round Grips with Section "V"
dia. 5 ÷ 12 mm
One set consists of a double pair of grips.

**H005-41**

Compression Device
Consisting of an articulated upper plate and a lower fixed one.

H005-42

Knurled Roller Clamping Device
Consisting of a pair of grips with max. capacity 20kN suitable for test on plastic films with a considerable thickness and hardness and similar materials.

H005-43

Device for tests on wires and ropes
Consisting of a pair of self-aligned rollers for tensile tests on wires and ropes of thin section with max. load capacity of 20 kN.

H005-44

Flexural and Bending test device in three spots
Suitable for flexural and bending tests on round and flat specimens.

H005-51

Device to centre the specimens
This device is composed by a pair of rollers installed on settable supports screwed on the tensile heads. By setting the supports in relation with the dimensions of the specimen, the user will obtain a stop that allows a rapid and right positioning of the specimen in the flat grips.
This accessory can be used only on machine with 50 kN, 100 kN and 200 kN capacity (models H005, H006, H007).



**H020****Marking-off machine**

Automatic, motorised
STANDARD: UNI 556

Used to mark off specimens with round, square shape and with improved bond for the measurement of the percentage elongation after their breaking, in accordance with the Standards.

The machine can mark specimens as follows:

- Round from 4 mm up to 50 mm. diameter.
- Flat from 4 mm. up to 50 mm thickness.
- Square from 4 mm. to 45 mm. side.

Useful length 300 mm.

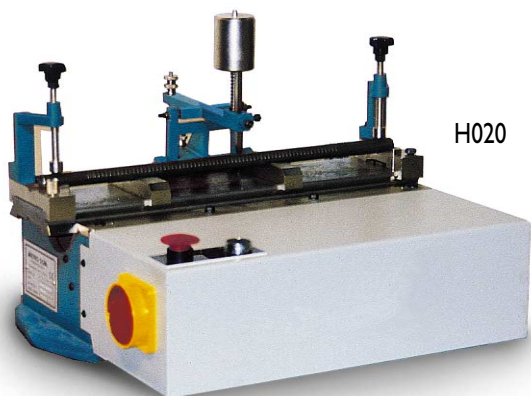
Marking steps: 5 or 10 mm. selectable with lateral graduation.

Marking speed: 60 marks per minute.

Power supply 400V 3ph 50 Hz

Dimensions: 530x480x445 mm.

Weight: approx. 58 Kg



H020

H021

Marking-off machine, same to mod. H020, but hand operated by rotating the handle.

H057**Broaching machine**

Used to make notchings on impact test bars for resilience tests.

The piston with rack grants a correct alignment of the broach to the specimen and a perfect axial thrust.



H057

H057-10

H057-11

ACCESSORIES:

H057-01

Broaching device for clamping and centering the specimen

H057-10

Broach for "V" notchings on specimens with square section 10x10 mm

H057-11

Broach for "U" notchings on specimens with square section 10x10 mm

Note: Available on request a large number of broaches to make Charpy, Izod, Mesnager, DVM both V and U notches.

H060**Pendulum impact Charpy tester for resilience tests**

STANDARDS: ASTM E23 - EN 7-55 - UNI 4431, 4714 - ISO TC/7

The tester is equipped with a falling pendulum hammer, able to break, with a single blow, a sample carved in the middle and positioned on two supports.

The test is carried out on a CHARPY sample in order to check the energy absorbed during the impact, which is measured in JOULE.

The value stands for the impact strenght of the material (resilience).

- Cast iron frame
- Pendulum with hardened knife
- Brake device to stop the pendulum
- Impact energy 300J with 2J Graduation
- Falling angle: 140°
- Real weight Kg. 21,300
- Impact speed: 5,182 m/s

Dimensions mm 450x900x1700

Weight: 470 Kg

H060



ACCESSORIES:

H060-01

SAFETY PROTECTION CAGE, to 89/392/CEE Directive.

H060-02

KNIFE-EDGE to perform resilience tests according to BS 131 Standards.

UNIVERSAL TENSILE/COMPRESSION MACHINE

- **Tensile tests on steel reinforced bars, up to 300 kN max. Capacity load.**
- **Compression tests on concrete cube and cylinder specimens up to 1500 kN max. Capacity load.**

STANDARDS: BS 1610 - ASTM C39, E4 - NF P 18-411 - DIN 51220 - AASHTO T22

This machine of compact design, is utilized to carry out tensile tests on steel reinforced bars from dia. 6 to 25 mm. and flat max. 25x15 mm. It can also carry out compression tests on concrete cube specimens max. side 150 mm. and cylinders max. dia. 160x320 mm.

The four columns loading frame is overdimensioned to assure high rigidity and stability. The loading piston, double action, is rectified and lapped. The piston is foreseen of an hydraulic maximum and minimum piston stroke's security device, by avoiding any damage risk due to wrong manipulations of the unit. An analogic device is foreseen to visualize, pre-select and adjust the applied speed rate.

Also a fast ram approach is foreseen to avoid losses of time. The hydraulic pump is multipiston, so to insure continuity of oil delivery.

A displacement device visualizes instant by instant the piston's excursions during the tests.

An hydraulic selector allows to select the tensile or the compression test. The heads holding the jaws are obtained from only one block of high tungsten steel, while the jaws are hardened over 65 HRC. The "V" autoclamping form allows a quick and practical churking of the specimen. A calibration certificate is supplied along with the machine.

The machine is supplied complete with pair of jaw-holders, but without accessoires for the tensile and compression tests, which must be ordered separately (see accessories).

TECHNICAL SPECIFICATIONS:

- Maximum tensile load: 300 kN
- Maximum compression load: 1500 kN
- Distance between the jaws: min. 300 mm - max. 400 mm
- Distance between the compression platens: 340 mm
- Distance between the columns: 270 mm
- Piston's stroke: 100 mm
- Precision and repeatability: $\pm 1\%$ of read value
- Power supply: 220-240 V 1 ph 50 Hz 750 W
- Dimensions: 780x420x1700
- Weight: 800 Kg



H011

H010



MODELS:

H010

Universal tensile/compression machine, motorized, measuring system with precision monometer dia. 250 mm. Bourdon type, double reading range, foreseen of max. load pointer.

H011

Universal tensile/compression machine, motorized, measuring system with electronic digital display unit with microprocessor; dual range, to measure the load and the deformation (through the extensometer mod. H014), with graphic display of large dimensions, and possibility to be connected to PC by RS232 link (remote control).

ACCESSORIES:

FOR TENSILE TESTS ON ROUND AND FLAT STEEL SPECIMENS:

H012-01

Set of 4 Jaws, upper and lower, for round steel specimens from dia. 6 to 15 mm., and flat specimens from 6 to 15 mm. thickness (max. width 25 mm).

H012-02

Set of 4 Jaws upper and lower for round specimens from dia. 15 to 25 mm

FOR COMPRESSION TESTS ON CONCRETE CUBE AND CYLINDER SPECIMENS:

H013-01

Upper compression platen foreseen of seat ball, fixing device, lower compression platen and distance pieces test cylinders max dia. 160x320 mm. and cubes 150 mm. max side.

The platens have dia. 216 mm. and are hardened and rectified as requested by Standards.

**H013-02**

Set of Safety Guards for mod. H010 and H011 machines, to 89/392/CEE Directive.

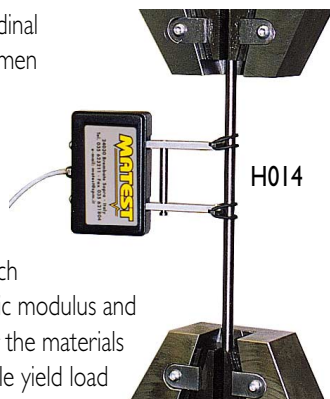
C120

Strip printer for the machine mod. H011.

H014**Electronic extensometer**

(only for mod. H011) MEASURING BASE 50 mm, Deformation range + 1 mm / - 0,2 mm. Max measuring deformation percentage: + 2%

This device records the longitudinal deformations of the steel specimen during the tensile test. It is connected to the digital display of the machine mod. H011, and through the program mod. H016 it supplies a load/deformation graphics from which it is possible to obtain the elastic modulus and the loads: Rp 01-Rp 0,2-Rt1 for the materials that do not show a clearly visible yield load stress. Supplied complete with cables and connectors.

**H016****Load / Deformation program**

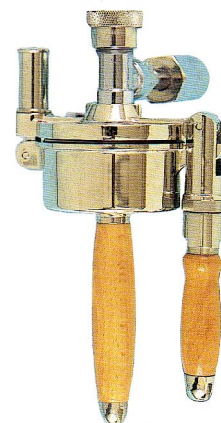
This Program, working on Microsoft Windows, allows the remote control and the visualisation in real time of the load and deformation, with printing of the graphic and test results.

H050**Dry-ice maker**

This device instantaneously produces the quantity of dry ice (solid CO₂) required to reach temperatures down to -80 °C.

The dry-ice maker must be connected to a liquid CO₂ bottle with connecting pipe and it produces 100 g. dry-ice tablets, having mm. 75 diameter and mm. 25 thickness.

Weight: 3 Kg



H050

H052**Cooling bath for resilience tests**

This apparatus is meant for Charpy tests to be carried out at low temperatures.

It is made from double chambered stainless steel with isolating cavity wall from foamed polyurethan, 65 mm. thick.

Complete with double chambered cover and specimen rack.

Internal dimensions: mm. 125x125xh 180

Weight: 12 Kg



H052

H054

H053**Cooling bath for resilience tests**

Similar to mod; H52 but having:

Internal dimensions: mm 335x235xh 210

H054

PLIERS, special-shaped, pliers to take cooled specimens from the bath and place them directly into the Charpy Pendulum.

H065

Bending machine

STANDARDS: 5.11.71 N° 1086 - D.M. 26.3.80 - ASTM A615 - 89

Fixing and changing the mandrels on top of the thrust cylinder is easy and practical and grants the operator a perfect interchangeability of the same.

A device prevents the unlocking of the bar under test from the relevant rollers and the contrasting mandrel both during the bending and the straightening operation.

The machine accepts bars up to Ø 32 mm. and is supplied complete with two series of rollers, having respectively Ø mm. 50 and 100.

The mandrels and the mandrel-holders are not included in the standard supply and have to be ordered separately.

SPECIFICATIONS:

- Max. piston load: 16.000 Kg
- Max. piston stroke: 550 mm
- Power supply: 400V 3F 50 Hz 1500W
- Dimensions: mm 1540x800xh 1300
- Weight: 350 Kg

ACCESSORIES:

H065-01

Safety guards to 89/392/CEE Directive.

section H

H065-01

H065

H065 DETAIL

This equipment has been studied and designed to carry out bending tests on steel bars for reinforced concrete.

The test consists in bending the bar at 180° or to bend the same at 90° and then straighten it of at least 20°.

This bending machine is composed of a rugged frame supporting a beam having a cylinder with relevant load piston fixed on it, being activated by an hydraulic cell complete with speed adjuster for the piston, direction control valve, max. pressure valve, control gauge.

The whole is cased to protect every single component from the dust, and the operator from any possible danger. A small bowl has been fitted under the beam, where the steel bar is bent.

Two contrasting rollers are fitted on the beam. They may easily be adjusted in distance to be in accordance with the Standards concerning bars having diameter between 6 and 32 mm.



DIAMETERS TABLE OF THE AVAILABLE MANDRELS FROM Ø 5 TO Ø 32 ACCORDING TO THE ITALIAN STANDARD

Ø SPECIMEN mm	MATERIAL	SURFACE L=plain AD=adherence	Ø MANDREL mm	MOD.
5	Fe 22 B	L	10	H066-01
	Fe 32 B	L	15	H066-03
	Fe 38 B	AD	15	H066-03
	Fe 44 B	AD	20	H066-06
6	Fe 22 B	L	12	H066-02
	Fe 32 B	L	18	H066-05
	Fe 38 B	AD	18	H066-05
	Fe 44 B	AD	24	H066-07
8	Fe 22 B	L	16	H066-04
	Fe 32 B	L	24	H066-07
	Fe 38 B	AD	24	H066-07
	Fe 44 B	AD	32	H066-10
10	Fe 22 B	L	20	H066-06
	Fe 32 B	L	30	H066-09
	Fe 38 B	AD	30	H066-09
	Fe 44 B	AD	40	H066-12
12	Fe 22 B	L	24	H066-07
	Fe 32 B	L	36	H066-11
	Fe 38 B	AD	36	H066-11
	Fe 44 B	AD	48	H066-15
14	Fe 22 B	L	28	H066-08
	Fe 32 B	L	42	H066-13
	Fe 38 B	AD	84	H066-23
	Fe 44 B	AD	112	H066-28
16	Fe 22 B	L	32	H066-10
	Fe 32 B	L	48	H066-15
	Fe 38 B	AD	96	H066-24
	Fe 44 B	AD	128	H066-30
18	Fe 22 B	L	36	H066-11
	Fe 32 B	L	54	H066-17
	Fe 38 B	AD	108	H066-26
	Fe 44 B	AD	144	H066-33
20	Fe 32 B	L	60	H066-19
	Fe 38 B	AD	160	H066-35
	Fe 44 B	AD	200	H066-38
22	Fe 22 B	L	44	H066-14
	Fe 32 B	L	66	H066-21
	Fe 38 B	AD	176	H066-36
	Fe 44 B	AD	220	H066-39
24	Fe 22 B	L	48	H066-15
	Fe 32 B	L	72	H066-48
	Fe 38 B	AD	192	H066-49
	Fe 44 B	AD	240	H066-50
25	Fe 22 B	L	50	H066-16
	Fe 32 B	L	75	H066-22
	Fe 38 B	AD	200	H066-38
	Fe 44 B	AD	250	H066-41

Ø SPECIMEN mm	MATERIAL	SURFACE L=plain AD=adherence	Ø MANDREL mm	MOD.
26	Fe 22 B	L	52	H066-51
	Fe 32 B	L	78	H066-52
	Fe 38 B	AD	260	H066-53
	Fe 44 B	AD	312	H066-54
28	Fe 22 B	L	56	H066-18
	Fe 32 B	L	84	H066-23
	Fe 38 B	AD	280	H066-43
	Fe 44 B	AD	336	H066-46
30	Fe 22 B	L	60	H066-19
	Fe 32 B	L	90	H066-55
	Fe 38 B	AD	300	H066-56
	Fe 44 B	AD	360	H066-57
32	Fe 22 B	L	64	H066-20
	Fe 32 B	L	96	H066-24
	Fe 38 B	AD	320	H066-45
	Fe 44 B	AD	384	H066-47

DIAMETERS TABLE OF THE AVAILABLE MANDRELS FROM Ø 9,52 TO Ø 35,81 ACCORDING TO ASTM STANDARD

Mod.	Ø Mandrel	Mod.	Ø Mandrel
H066-12	40 mm	H066-32	140 mm
H066-15	48 mm	H066-34	150 mm
H066-20	64 mm	H066-35	160 mm
H066-25	100 mm	H066-37	180 mm
H066-27	110 mm	H066-40	224 mm
H066-29	125 mm	H066-42	256 mm
H066-31	132 mm	H066-44	288 mm

All mandrels have been produced from quality steel and cadmium plated for rust protection, and from Ø 10 mm. up to Ø 96 mm. included have been hardened to make them wearproof.

AVAILABLE MANDREL-HOLDERS

H067-01 Mandrel-holder Ø 10 a 12 mm

H067-02 Mandrel-holder Ø 15 a 20 mm

H067-03 Mandrel-holder Ø 24 a 50 mm

H067-04 Mandrel-holder Ø 54 a 96 mm

From Ø 100 to 384 mm. the mandrel is directly fitted to the piston without using a mandrel-holder.

C35I

Specimen cutting machine

It accepts blades up to dia. 355 mm

Shear capacity: 120 mm

Power supply:

220-240 V 1F 50 Hz 2000W

Dimensions: 560x460x390

Weight: 20 Kg

ACCESSORY: **C350-03** DIAMOND BLADE having dia. 350 mm

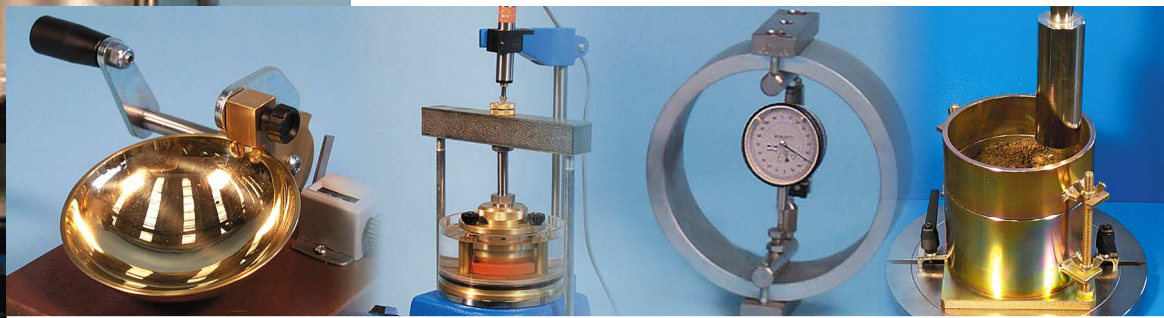


C35I



Section S^{SOIL}

For the realization of civil engineering structures, the engineer during the design stage must base his calculations according to the soil properties where the structure will have to integrate. This section studies and analyses a soil sample to evaluate and to know its characteristics, by proposing a complete range of testing equipment for: sampling, preparation, classification, consolidation, shear strength, triaxial, compaction, penetration, bearing capacity, permeability, density, geotechnical and chemical tests, in compliance with the EN, ASTM, BS and the most known International Standards.



Index section

SOIL

	Mod.	Page		Mod.	Page
Absorption cone and tamper	S148.....	201	Lightweight dynamic penetrometer	S050.....	190
Acidity test kit of water	S135.....	199	Limits of soils	S165/S178.....	204/205
Air compressor, triaxial	S351.....	234	Linear shrinkage mould	S176.....	204
Air/water pressure system, triaxial	S350.....	234	Loads in piles	S228.....	217
Andreasen pipette	S144.....	200	Load proving rings.....	S370.....	246
Augers, hand and powerhead.....	S092/S098.....	195	Moisture density (Proctor test)	S185/S194.....	205/206
Autographic unconfined apparatus.....	S130.....	198	Moisture density gauge, nuclear.....	S060.....	192
Balloon density apparatus	S230/S233.....	220	Null indicator, triaxial.....	S353.....	235
Bearing plate test equipment.....	S222/S226.....	219	Oedometer.....	S260.....	224
Blue methylene test set.....	S157.....	201	Organic matter test set	S138.....	199
Calibration unit for dials			Particle size sedimentation.....	S144/S155.....	200
and extensometers	S390.....	247	Penetrometers, static and dynamic	S050/S063.....	190/191
CBR - California bearing ratio	S200.....	210	Penetrometers, liquid limit.....	S165.....	204
CBR - in situ apparatus.....	S220.....	216	Penetrometers, pocket	S065/S071.....	193
CBR/Marshall testers	S213/S214.....	213/214	Penetrometer, Proctor	S088.....	194
CBR/Proctor compactor	S198.....	209	Penetrometer, proving ring.....	S086.....	194
CBR testing machines	S209/S211.....	212/213	Permeameters	S245/S254.....	222/223
Chloride test kit of water.....	S136.....	199	Plastic limit set	S178.....	205
Cohesionless relative density.....	S238.....	217	Plate bearing test equipment.....	S222/S226.....	218/219
Colour soil and standard charts	S132/S133.....	199	Proctor/CBR compactor	S198.....	209
Compaction moulds and rammers,			Proctor test: moisture/density.....	S185/S194.....	206
Proctor	S185/S194.....	206/207	Proving rings, load.....	S370.....	246
Compaction permeameters	S252.....	223	Pyknometers.....	S147.....	201
Compactor, CBR/Proctor	S198.....	209	Relative density cohesionless	S238.....	217
Cone and tamper, sand absorption.....	S148.....	201	Sampler, hollow punch.....	S118.....	196
Cone penetrometers: liquid limit	S165.....	204	Sampler, soil.....	S053.....	190
Consolidation apparatus: oedometer	S260.....	224	Sampler, core cutter	S084.....	195
Constant head permeameters	S245.....	222	Sand absorption cone + tamper.....	S148.....	201
Conversion frame, CBR.....	S221.....	216	Sand density cone, pouring apparatus	S234/S237.....	221
Core cutter; Soil samplers.....	S084/S085.....	195	Sand equivalent value	S158.....	202
Data acquisition and processing	S349/S364.....	236/245	Seismograph	S079.....	194
De-airing tank.....	S355.....	235	Shear apparatus, direct/residual	S280.....	226/228
Density bottles, Gay Lussac.....	V105.....	201	Shear vane, pocket.....	S075.....	193
Density of soil in place.....	S230/S237.....	220/221	Shrinkage limit set	S175.....	204
Dial indicators.....	S375/S383.....	247	Shrinkage mould.....	S176.....	204
Direct/Residual shear test apparatus	S280.....	226/228	Stabilized soil strength	S195.....	208
Earth resistivity meter	S077.....	194	Triaxial equipment.....	S301/S364.....	229/245
Extruders.....	S112/S114.....	196	Unconfined compression testers.....	S130.....	198
Falling head permeameter.....	S246.....	222	Universal multi-speed load frame	S212/S215.....	214/215
Hardness test kit of water.....	S137.....	199	Vane field tester.....	S058.....	190
Hollow punches and tampers	S122/S123.....	197	Vane, laboratory.....	S080.....	192
In-situ CBR test set	S220.....	216	Vane shear, pocket.....	S075.....	193
Ion exchange device	S140.....	198	Vibrating compaction hammer.....	S197.....	208
Lathe.....	S120.....	197	Water level indicator	S061.....	192





S050

Lightweight dynamic penetrometer

STANDARD: DIN 4049

Used to establish the thickness of different strata, when testing compaction works and to determine the relative density of fills and naturally deposited non-cohesive soils.

In general if the ground is not too compact, penetration tests can be carried out about 8 to 12 metres.

The penetrometer set consists of:

10 Kg. drop rammer, 500 mm. fall and anvil

11 sounding rod Ø 22 mm. x 1 m. length complete with threaded collar and guiding rod

Grooved rod to extract samples

2 drive point 90°, 5 cm² and 10 cm² surface

Lifting device for sounding rod, accessories

Carrying case

Dimensions: 1080x360x220 mm

Weight: 72 Kg

S050



S053



S053-04

S054

S053

Soil sampler

Used to obtain undisturbed soil samples of dia. 1 1/2" (38 mm)

The sampler is formed by:

T handle with extension rod, 900 mm long

Jarring link 3/4"

Stainless sample tube dia. 1 1/2" x 7" (38x175 mm)

Weight: 7 Kg

SPARE-PART AND ACCESSORY:

S053-04

Spare stainless sample tube dia. 1 1/2" x 7"

S054

Hand extruder used to extrude the soil specimens dia. 1 1/2" from the sample tube.

S058

Field vane tester

STANDARDS: BS 1377 - ASTM D 2573

Used to determine shear strength of cohesive very soft, to firm non-fissured soils on site.

The max. torque value is measured on a collar attached to the shaft.

The equipment consists of:

Measuring head comprising a T-handle spring loaded, range 0 to 200 kPa

6 extension rods 500 mm long

3 vanes (dia. x height) 16x32 - 20x40 - 25,4x50,8 mm with vane dummy and tools

Carrying case

Weight: 5 Kg

S058



**S062****Dynamic automatic penetrometer + soil screw sampler**

Used for dynamic penetrometric tests with weights of 20 and 30 Kg. Complete with double action hydraulic cylinder activated by Brigg-Stratton petrol engine 5 Hp, 10 penetration rods, 9 lining tubes, 7 points 10 cm², hydraulic extractor; automatic soil screw sampler dia. 38x1000 mm accessories.

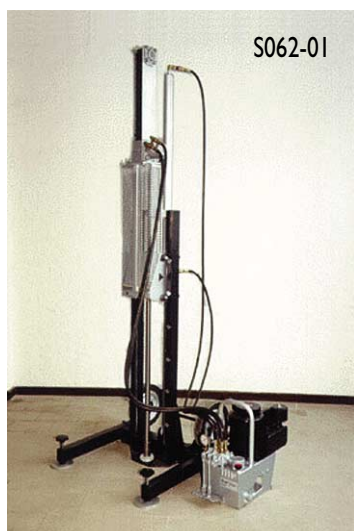
Weight: 157 Kg

**S062-01****Dynamic automatic penetrometer "S.C.P.T." (Standard cone penetration testing)**

Used for dynamic penetrometric tests with 73 Kg weight and 75 cm fall height.

Complete with hydraulic extractor and trailer; double action hydraulic cylinder activated by Brigg-Stratton petrol engine 5 Hp, 10 penetration rods, 10 lining tubes, 7 points 20 cm², accessories.

Weight: 330 Kg

**S063****Static hydraulic penetrometer 50 kN**

Used for static penetrometric tests with a Begemann point and two high precision manometers to measure the RP-RI-RT values.

Complete with hydraulic double action cylinder activated by Brigg-Stratton petrol engine 5 Hp, automatic hydraulic spanner, 4 screw anchors, 1 Begemann point, 10 penetration rods, 10 inside rods, accessories.

Weight: 200 Kg

**S063-01****Static hydraulic penetrometer 120 kN**

Used for static penetrometric tests with a Begemann point and two high precision manometers to measure the RP-RI-RT values.

Complete with hydraulic double action cylinder activated by Brigg-Stratton petrol engine 13 Hp, two automatic hydraulic spanners, 4 screw anchors, 1 Begemann point, 10 penetration rods, 10 inside rods, Trailer; accessories.

Weight: 800 Kg





192

S060

Nuclear moisture density gauge

STANDARDS: ASTM D2922, D2950, D3017 - BS 1337, 1924

It provides a rapid method of on-site determination of moisture density content of soils, aggregates and asphaltic concrete.

The microprocessor displays all functions directly.

Wet and dry density, moisture percent, moisture content, percent compaction for both soils and asphaltic concrete, void ratio and percent air voids.

Surce is 200 mm. with index rods for direct transmission depths in 25 mm. increments. Stores up to 320 field tests, transferable to PC or printer.

Gage dimensions: 400x220x140 mm

Weight: 14 Kg

S060



Water level indicator

Utilized to measure the water level in boreholes, wells and any open underground structures.

A light and audible signal are activated when the probe touches water.

Battery operated, the cable is marked at cm. intervals, drum mounted and the stainless steel tip has diameter of 10 mm

MODELS:

S061 Water level indicator, 50 m cable length

S061-01 Water level indicator, 100 m cable length

S061-02 Water level indicator, 200 m cable length

S061



S080

Laboratory vane apparatus

STANDARD: BS 1377

Used to determine the shear strength of a sample of soil confined within its sample tube. The equipment is supplied with hand operated clutch and the load is applied through the 12,7x12,7 mm. vane by means of any of the four calibrated springs supplied with the instrument.

Dimensions: 300x200x500 mm

Weight: 9 Kg

S080



ACCESSORIES:

S080-03 Vane 12,7 mm diameter x 19 mm long

S080-04 Vane 12,7 mm diameter x 25,4 mm long

S080-05 Attachment to take 38 and 100 mm dia. sample tubes

S080-06 Motorising attachment with feed rate of 10°/min.
220-240V 1ph 50 Hz

SPARE-PARTS:

S080-01 Spare set of four calibrated springs

S080-02 Spare vane 12,7 mm diameter x 12,7 mm long



POCKET PENETROMETERS AND SHEAR VANES

STANDARDS: ASTM D 1558 - D 2573

MODELS:

S065

DIAL POCKET PENETROMETER, for the classification of cohesive soils in terms of consistency, shear strength and approximate unconfined compression strength.

Direct value read in Kg/cm^2 on the dial graduated from 0 to 5 Kg/cm^2 . Peak hold feature; zero setting by push button.

Weight: 300 g

S066

DIAL POCKET PENETROMETER, identical to mod. S065 but with dial range 3-15 Kg/cm^2 , suitable for very compacted soils.

S068

GEOPOCKET DIAL PENETROMETER, designed for a quick determination of the foundation soils, from clay to sandy soils.

It indicates:

- The angle of internal friction (sandy soils)
- The cohesion "C" (clay soils) and the approx. Unconfined Compressive Strength.

Peak hold feature; zero setting by push button.

Complete with 5 plungers \varnothing 6,4 - 10 - 15 - 20 - 25 mm.

Weight: 400 g

S070

POCKET PENETROMETER, designed for the rapid determination of soil consistency, shear strength and approximate Unconfined Compression Strength. Scale range 0-4,5 Kg/cm^2 with direct reading strength values. Plunger dia. 6,35 mm.

Weight: 300 g

S071

POCKET PENETROMETER, identical to mod. S070, but having a range of 0 - 16 Kg/cm^2 . Suitable for very compacted soils.

Weight: 800 g.

S075

POCKET SHEAR VANE DEVICE RANGE: 0-1 KG/CM^2

Designed for the rapid determination in the field or in the laboratory of shear strength of cohesive soils. The dial indicates directly the shearing strength in Kg/cm^2 .

Complete with interchangeable stainless steel vane.

Weight: 300 g.

S076

POCKET SHEAR VANE DEVICE RANGE: 0-2 KG/CM^2

Identical to mod. S075 but dial range 0-2 Kg/cm^2 .

SPARE-PART:

S076-01

Stainless steel vane for S075 and S076 devices.

MELTING POT, to melt wax and to cover soil samples keeping them to the original humidity. See pag. 26



A106



S077

Earth resistivity meter

STANDARD: ASTM G57

Used for ground water researches even to great depths, gravel deposit evaluation, geological surveys for the construction of roads, pipelines etc., study and prevention of landslides.

The system consists of:

- Resistivity measuring instrument
- 3 unpolarizable electrodes
- 2 current electrodes
- 2 cable reels with 300 m of cable
- 2 cable reels with 100 m of cable
- 2 hammers
- set of standard accessories



ACCESSORY:

S078-01

Power energiser

Energy source for geoelectrical surveys (in alternative to dry batteries or generators).

Dimensions: 35x25x24 cm.

Weight: 6 Kg

S079

Enhancement seismograph, three channels

Used for depth determination of bedrock, foundation investigations, evaluation of gravel, sand, clay etc. deposits.

Instruments managed by a micro-processor.

Incorporated printer.

Complete with set of accessories.



S079

S086

Proving ring penetrometer

Used to determine the bearing strength, compaction degree of subgrades, and also for determining the penetration resistance of soil.

Supplied complete with "T" handle, proving ring 100 kgf (1 kN) with maximum load pointer and calibration chart, extension rod 500 mm. long graduated every 100 mm., removable cone point 30° with 1 sq. in. top area.

Cadmium plated against corrosion.

Weight: 5 Kg



S086

MIXERS to prepare soil samples.

See pag. 41 and pag. 159



E094

S088

Proctor penetrometer

STANDARD: ASTM D 1558

Used to determine in field the moisture-penetration resistance relationship of fine grained soils.

Spring load with direct reading in Kg. on the sliding rod.

Complete with 9 interchangeable stainless steel needles dia. 4,52 - 5,23 - 6,40 - 9,07 - 12,83 - 16,54 - 20,22 - 24,79 - 28,55 mm., accessories, carrying case. Chromed finishing.

Weight: 8 Kg



S088

SURFACE SOIL SAMPLER / CORE CUTTER

Used to take field samples of compacted fill or undisturbed soils and to evaluate density of compaction samples as the ground surface.

The set consists of a drop hammer sliding on the drive rod and falling on the drive head where the sampling tube is hold.

Cadmium plated against corrosion.

MODELS:

S084

SURFACE SOIL SAMPLER with sampling tube 73 mm inside diameter x 66 mm long and 5 Kg. drop hammer.

STANDARDS: ASTM D 2937 - CNR N° 22

Weight: 10 Kg

S085

SURFACE SOIL SAMPLER with sampling tube 100 mm diameter, capacity 1/30 cu.ft. and 10 Kg. drop hammer.

STANDARD: BS 1377:9

Weight: 16 Kg

SPARE PARTS:

S084-01 Sampling tube 73 mm diameter x 66 mm long

S085-01 Sampling tube 4" diameter and capacity 1/30 cu.ft.

HAND AUGERS

STANDARDS: ASTM D 420, D 1452 - CNR aVI n° 25
AASHTO T86, T202

Designed for soil investigations and explorations.

Plated against corrosion.

MODELS:

		Weight Kg
S092	Hand Auger, 80 mm dia. x 1 m long	4
S093	Hand Auger, 100 mm dia. x 1 m long	5
S094	Hand Auger, 150 mm dia. x 1 m long	6
S095	Extension rod for above 1 m long	2
S096		



Soil auger powerhead, fitted with two handwheels, to be utilized just by one operator. Lightweight and easy to use. Motor capacity 48 cc. two strokes, electronic starting. Supplied complete, except for the augers. Weight: 10 Kg

S098

Soil auger powerhead, fitted with two handwheels. It must be utilized by two operators. Motor capacity 106 cc. two strokes, electronic starting. Speed inverter to facilitate the extraction of the augers. Supplied complete except for the augers. Weight: 27 Kg

ACCESSORIES:

S097-01 Auger 60 mm dia. x 1 m long

S097-02 Auger 80 mm dia. x 1 m long

S097-03 Auger 100 mm dia. x 1 m long

S097-04 Auger 150 mm dia. x 1 m long

S097-05 Auger 200 mm dia. x 1 m long



SI12

Universal screw extruder - hand operated

STANDARDS: ASTM D698, D1587, D1883 - BS 598, 1377, 1924

Used for a smooth and rapid extrusion of soil samples from tubes also of thin walls with minimal disturbance. The unit extrudes samples from dia. 38 to 100 mm with max. stroke of 650 mm. Supplied complete with adaptors to extrude samples having dia. 38, 60, 100 mm, supporting bench, sample receiving table both adjustable in height and lowerable.

Dimensions: 1700x700x1200 mm

Weight: 90 Kg



SI12

SI13

Universal screw extruder - motorized

Identical to mod. SI12, but actuated by an electric motor that eliminates the hand working of the operator.

Power supply: 220-240V 1ph 50 Hz

Weight: 110 Kg



SI13

SI14

Universal extruder - hand operated

STANDARDS: ASTM D698, D1587, D1883 - BS 598, 1377, 1924

Used to extrude samples having dia. 4", 6", 100 mm, 150 mm. It can therefore extrude CBR, Marshall and Proctor specimens. The extruder is actuated by a 50 kN hydraulic jack, having ram travel of 190 mm + 170 mm screw.

Dimensions: dia. 300x500 mm

Weight: 30 Kg



SI14

SI18

Soil hollow punch / sampler

To compress loose soils and to hollow punch samples to carry out shear, consolidation, triaxial and unconfined tests.

Dimensions: 500x300x900 mm

Weight: 30 Kg



SI18

ACCESSORY for mod. SI12 and SI13:

SI13-01

Adaptor (ring + tamper) to extrude soil sample from dia. 38 to 100 mm. When ordering please specify required diameter.

S120**Soil lathe**

Designed to reduce by trimming the diameter of a soil sample until reaching the desired diameter size by using a wire saw.

The lathe is hand-operated, the height is adjustable up to 230 mm, and it accepts samples from dia. 30 to 115 mm.

Supplied complete with three sets of platens for samples dia. 38 - 50,47 - 60 mm, wire saw and 6 wires.

Dimensions: dia. 460x720 mm

Weight: 20 Kg

ACCESSORY:

S120-01 Upper and Lower trimming platen available from dia. 30 to 115 mm.

When ordering please specify required diameter.

**S125**

Trimming knife to prepare samples.

S124

Wire saw for trimming soil specimens. Complete with six wires.

HOLLOW PUNCHES AND TAMPERS

Used to prepare soil samples and to fit them into the relevant cells to carry out triaxial, consolidation, shear, unconfined tests.

The punch has thin walls with cutting rim, and the tamper expels the specimen from the hollow punch by inserting it directly into the cell without disturbing the same.

Models				Cell	Hollow Punch	Tamper
Ø	50,47	xh	20 mm	Consolidation	S122	S123
Ø	71,40	xh	20 mm	Consolidation	S122-01	S123-01
Ø	79,80	xh	20 mm	Consolidation	S122-02	S123-02
Ø	112,80	xh	25 mm	Consolidation	S122-03	S123-03
Ø	50,47	xh	20 mm	Consolidation Permeability	S122-04	S123
Ø	71,40	xh	20 mm	Consolidation Permeability	S122-05	S123-01
Ø	79,80	xh	20 mm	Consolidation Permeability	S122-06	S123-02
Ø	112,80	xh	25 mm	Consolidation Permeability	S122-07	S123-03
Ø	50	xh	25 mm	Shear	S122-08	S123-08
Ø	60	xh	25 mm	Shear	S122-09	S123-09
Ø	100	xh	25 mm	Shear	S122-10	S123-10
☒	60x60	xh	25 mm	Shear	S122-11	S123-11
☒	100x100	xh	25 mm	Shear	S122-12	S123-12
Ø	38	xh	76 mm	Triaxial and Unconfined	S122-13	S123-13
Ø	50	xh	100 mm	Triaxial	S122-14	S123-14
Ø	70	xh	140 mm	Triaxial	S122-15	S123-15
Ø	100	xh	200 mm	Triaxial	S122-16	S123-16

S122 ÷ S123-16





S130

Autographic unconfined compression apparatus

STANDARDS: ASTM D2166 - AASHTO T208 - BS 1377

Used for the rapid determination of unconfined compression and shear strength on site, drawing a stress/strain curve on the chart fitted to the front of the apparatus.

The unit is designed for testing specimens dia. 38 mm. x 80 mm. height, and is supplied with a pair of flat platens, a set of charts, four calibrated springs: 2 - 4 - 8 - 16N, transparent mask, portable case.

Dimensions: 420x420x920 mm

Weight: 15 Kg



S130

ACCESSORIES for mod. S130 - S131:

S053 Sampler dia. 38 mm (see pag. 190)

S054 Hand extruder

S122-13 Hollow punch dia. 38x76 mm

S123-13 Tamper dia. 38 mm

SPARE PART:

S130-01 Chart stress strain curve, pack of 100

S140

Ion exchange device

This device is used to know the sulphate content of ground water and water soil extracts.

Consisting of a ion exchange glass tube 400 mm long, connector and bottom flask 1500 ml capacity.

The unit is assembled on a stand.

Dimensions: 190x110x600 mm

Weight: 5 Kg

ACCESSORY:

V300-30

Ion exchange resin, 500 g



S140

S131

Unconfined compression tester

STANDARDS: ASTM D2166 - AASHTO T208 - BS 1377

This hand-operated tester, utilized both on site and in laboratory, applies the load by a handwheel and strength is read on a proving ring 200 Kg. capacity.

The apparatus can test samples up to dia. 80 mm. x 200 mm

height and is supplied complete with proving ring, upper and lower plate, dial gauge

Dimensions: 380x460x1380 mm

Weight: 68 Kg



S131

REMARKS:

The frame of the tester mod. S131 supports loads up to 50 kN and it is possible to get a CBR testing machine, by adding the following accessories:

S370-09 Proving ring 50 kN capacity

S212-01 CBR penetration piston

S213-03 Adjustable dial gauge holder

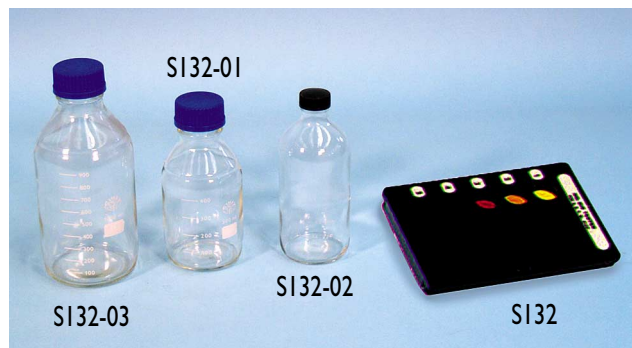
Furthermore the mechanical jack of the tester can be utilized for the in-situ CBR tests, by adding the accessories listed under mod. S220 (see pag.216)

**S132****Colour standard chart**

STANDARDS: ASTM C40 - AASHTO T21 - UNI 8020-14

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

Original Hellige chart with 5 glass reference scales.



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

S133**Soil colour chart**

Colour matching charts for soil identification.

The set consists of 7 constant hue charts with 196 colours.

S133-01

TROPICAL SOIL COLOUR CHART. This consists of 2 charts and colour name diagrams. Charts fit into S133.

**S135**

ACIDITY TEST KIT OF WATER to evaluate the potential corrosive.

The set comprises different graduated containers, reagents, syringe, pipette, instructions.

S136

CHLORIDE TEST KIT OF WATER. The set comprises different

reagents, graduated containers, pipette, syringe, instructions.

S137

HARDNESS TEST KIT OF WATER, for calcium and magnesium percentage determination.

The set comprises different reagents and graduated containers, syringe, pipette, instructions.

S138

ORGANIC MATTER TEST SET.

STANDARD: BS 1377

Formed by different bottles, reagents and accessories to perform about 50 tests for each of the soil factors on the following tests: pH - pH Nitrate - Ammonia - Nitrate Nitrogen etc.

S138



Particle size sedimentation by the pipette method

STANDARD: BS 1377

- S144** ANDREASEN PIPETTE, for an accurate extraction of the soil suspension. Capacity 25 ml.
- S144-01** PIPETTE STAND, to accurately raise and lower the Andreasen Pipette with no transmission of vibrations. Weight: 10 Kg approx.
- S144-02** Sedimentation cylinder 500 ml. capacity
- S144-03** Rubber bung for cylinder
- S144-04** Evaporating dish, glass, dia. 90 by 50 mm. height
- VI72-03** Soil Hydrometer long stem, graduated 0,995 to 1,030 g/ml
- S155-04** Glass tank dimensions: 600x300x380 mm
- S155-08** Heater, thermostat, cooling coil, circulation unit, thermometer.
220-240V 1ph 50 Hz 1000 W

S155

Particle size sedimentation by the hydrometer method

STANDARDS: ASTM D 422 - AASHTO T88 - BS 1377/2

To determine the quantitative granulometric distribution of particle-size in soils passing through the ASTM n° 200 sieve (0,074 mm)

The set consists of:

- S155-01** Sedimentation cylinder 1000 ml capacity (total n° 6 pieces)
- VI72** Soil Hydrometer 151 H, scale: $0,995 \div 1,038$ g/ml with div. 0,001
- S155-04** Glass tank, dimensions: 600x300x380 mm
- VI04-03** Pyrex beaker, 250 ml capacity
- V300-23** Sodium hexametaphosphate, 1000 g
- S156-01** Mechanical analysis stirrer, 10000 rpm, complete with paddle, dispersion cup, anti-splash baffle. Used for dispersing soil samples in water: 220-240V 1ph 50 Hz
- S155-08** Heater; thermostat, cooling coil, circulation unit, thermometer: 220-240V 1ph 50 Hz 1000 W.

Weight of the set: 60 Kg



ACCESSORIES:

- VI72-02** Soil hydrometer 152H, scale: -5 +60 g/litre
- S155-02** Rubber bung for the cylinder S155-01
- S156** Manual stirrer for cylinders 1000 ml capacity. NF P94-057
- S156-03** Manual stirrer for cylinders 2000 ml capacity. NF P94-057



S157**Blue methylene test set**

STANDARDS: EN 933/9 - NF P94-068 - XP P18-592 - UNI 8520
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 support and 70 mm dia. propeller: 200-240 V 1ph 50 Hz

S157-02 Burette 50 x 0,1 ml with stopcock, support and pan

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

S157-04 Glass rod dia. 8x300 mm

S157-05 3000 ml capacity plastic beaker

V300-28 Methylene blue, 100 g

V300-29 Kaolinite, 500 g

Total Weight: 10 Kg

**ACCESSORY:**

S157-10 Automatic dispenser; 0-10 ml x 0,1 ml grad.
Capacity 1000 ml
(as an alternative to the Burette S157-02)

S147**Pyknometer**

STANDARDS: BS 812, 1377 - ASTM D854 - AASHTO T100

For particle density (specific gravity) of sands and fine aggregate, relative density and water absorption for aggregates max. 10 mm size. Glass jar made with aluminium cone and rubber seal.

Capacity: 1000 g.

PYKNOMETERS

STANDARDS: EN 1097/6 - BS 812 - DIN 12039 - ASTM C127, C128

Used to evaluate the bulk density and voids of aggregates.

Pyrex glass made, complete with capillary tube stopper.

MODELS:

Capacity	Mouth Ø 29÷32 mm	Mouth Ø 40÷45 mm
250 ml	V105-03	-
500 ml	V105	V105-04
1000 ml	V105-01	V105-05
2000 ml	V105-02	V105-06

**DENSITY BOTTLES
GAY-LUSSAC TYPE**

STANDARDS: BS 1377, 812

ISO 3507

ASTM D854

EN 1097/7

NF P18-558

AASHTO T100

For determining the particle density (specific gravity) of sand, fine aggregate and filler.
Pyrex glass made, complete with capillary tube stopper.

MODELS:

V108	capacity	25 ml
V108-01	capacity	50 ml
V108-02	capacity	100 ml

S148**Sand absorption cone and tamper**

STANDARDS: BS 812 - ASTM C128 - AASHTO T84 - EN 1097/7

For the determination of the particle density (specific gravity) of fine aggregates, max. 20 mm size.



SAND EQUIVALENT TEST

Used to determine the relevant proportions of clay-like or plastic fines and dusts in granular soils and fine aggregates.

MODELS:

SI58

Sand equivalent (complete set)

STANDARDS: ASTM D2419 - AASHTO T176

The set comprises:

- SI58-01** Plexiglass graduated measuring cylinder (5 pieces)
 - SI58-02** Rubber stopper for cylinder (2 pieces)
 - VI76-02** Graduated rule 500 mm, stainless steel
 - VI36-01** Funnel, wide mouth
 - SI58-04** Measuring can 88 ml capacity
 - VI21** Plastic bottle, 5 litre capacity
 - SI58-06** Irrigator tube with stopcock and syphon assembly
 - SI58-07** Weighted foot assembly for sand level
 - A052-44** Sieve, dia. 200 mm, opening 4,76 mm
 - SI58-09** Concentrated stock solution, 1000 ml
 - VI70** Stop watch, digital
 - SI58-11** Clamp stand set to hold the syphon assembly with bottle
 - SI58-12** Portable carrying case, dimensions: 550x250x400 mm
- Total Weight: 18 Kg

SI58-20

Sand equivalent (complete set)

STANDARD: EN 933-8 - NF XP18-598 - UNI 8520 - CNR N.27
UNE 83131, 7324

The set is identical to mod. SI58 except:

- SI58-03** Plexiglass measuring cylinder graduated at 100 and 380 mm (5 pieces)
- SI58-05** Measuring can 200 ml capacity
- SI58-10** Irrigator tube with stopcock and syphon assembly
- SI58-13** Weighted foot assembly for sand level
- A052-37** Sieve dia. 200 mm, opening 2 mm

SI58



SI59

Sand equivalent (simple set)

STANDARDS: ASTM D2419 - AASHTO T176

The set comprises:

- SI58-01** Plexiglass graduated measuring cylinder (4 pieces)
- SI58-02** Rubber stopper for cylinder (2 pieces)
- VI76-02** Graduated rule 500 mm, stainless steel
- VI36-01** Funnel, wide mouth
- SI58-04** Measuring can 88 ml capacity
- VI21** Plastic bottle 5 litre capacity
- SI58-06** Irrigator tube with stopcock and syphon assembly
- SI58-07** Weighted foot assembly for sand level
- SI58-09** Concentrated stock solution, 1000 ml

Total Weight: 5 Kg

SI59-01

Sand equivalent (simple set)

STANDARD: EN 933-8 - NF XP18-598 - UNI 8520 - CNR N.27
UNE 83131, 7324

The set comprises the same items of mod. SI59, but it conforms to the above Specifications.

SI59



**SI60****Motorized sand equivalent shaker**

STANDARDS: ASTM D2419 - AASHTO T176

The unit provides a constant uniform shaking with automatic cycle test.

Oscillating excursion is 203 mm at 175 strokes/min. rate.

Complete with timer that automatically stops the shaker at the end of the test.

Power supply: 220-240V 1ph 50 Hz 250 W

Dimensions: 700x360x350 mm

Weight: 30 Kg



SI60

SI60-01

Motorized sand equivalent shaker, as described, but equipped with safety cover to 89/392/CEE Directive.



SI60-01

SI61**Sand equivalent shaker hand operated**

STANDARDS: ASTM D2419 - NF XP18-598

AASHTO T176 - EN 933/8

UNI 8520 - UNE 83131, 7324

Hand operated working through hand-wheel. Complete with mechanical strokes counter.

Dimensions: 700x350x420 mm

Weight: 20 Kg



SI61

SI62**Motorized sand equivalent shaker**

STANDARD: EN 933-8 - NF XP18-598 - UNI 8520 - CNR N.27
UNE 83131, 7324

Identical to mod. SI60, but having oscillating excursion of 200 ± 10 mm at 180 strokes/min. rate as requested by above Specifications.

SI62-01**Motorized sand equivalent shaker**

STANDARD: EN 933-8 - NF XP18-598 - UNI 8520 - CNR N.27
UNE 83131, 7324

Same to mod. SI62, but equipped with safety cover to 89/392/CEE Directive, and conforming to above Specifications.



LIQUID LIMIT DETERMINATION: CONE PENETROMETER METHOD

STANDARDS: BS 1337/2 - NF P94-052, I

The test is based on the relationship between the moisture content and the penetration of the cone into the soil sample. The apparatus is composed by: cast aluminium base, 150 mm dia. dial subd. 0,1 mm, calibrated cursor; automatic zeroing device, release button, micro-metric displacement device, penetration test cone, two sample brass cups.

MODELS:

S165

Cone penetrometer

Standard type, supplied complete.

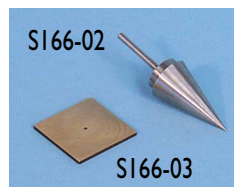
Weight: 13 Kg



S165 + B057-02



S166



S166-02

S166-03

S166

Semi-automatic cone penetrometer

Equipped with built-in five seconds timer to perform greater uniformity test results. Supplied complete.

Power supply: 220-240V 1ph 50 Hz

Weight: 15 Kg

ACCESSORIES:

S166-03

Test gauge, to check the condition of the cone point.

B057-02

Mirror, to facilitate the height adjustment of the cone

SPARE PARTS:

S166-01

Penetration test cone 35 mm long, 30° angle

S166-02

Weight: 30 g.

V122-05

Brass cup dia. 55x35 mm

V122-06

Brass cup dia. 70x45 mm



S176

S176

Linear shrinkage

STANDARD: BS 1377:2

Mould to produce a specimen of 140 mm. long x 12,5 mm radius. This test covers the determination of linear shrinkage of soils and indicates the plastic properties of soils with a low clay content.

Weight: 500 g

S175

Shrinkage limit

STANDARDS: ASTM D 427 - AASHTO T 92 - UNI 10014

UNE 7016 - NF P94 - 060 - BS 1377

Used to determine the maximum moisture content at which the soil does not shrink after drying the sample.

Complete with carrying case.

The set comprises:

V122-04 Shrinkage dish, dia. 45x12,7 mm (2 pieces)

V122-03 Crystallizing dish, dia. 57x32 mm

S175-03 Shrinkage plate, made from plexiglass material with three metal prongs

S175-04 Glass evaporating dish, dia. 120 mm flat bottom

V100-01 Graduated cylinder 25 ml. capacity

V192 Flexible spatula, 100 mm. blade

Weight: 2 Kg



S175

S175-07

SHRINKAGE LIMIT, complete set, without carrying case



205

S170 ÷ S173-06



LIQUID LIMIT: CASAGRANDE METHOD

STANDARDS: ASTM D4318 - AASHTO T89 - BS 1377
CNR/UNI 10014 - NF P94-051 - UNE 7377, 7002

Used to evaluate the relationship between the moisture percentage of a soil sample and the number of blows required to close a groove made into the soil; and therefore to determine when a clay soil changes from a plastic to a liquid state.

The unit comprises a removable brass cup which through a cam device drops on a bakelite base (or hard rubber base). Supplied complete with drops counter, but without grooving tool which has to be ordered separately.

The instrument is available in two versions:

- hand operated through crank
- motor operated at 120 drops/min speed, ensuring better uniformity and accuracy

MODELS:

S170

Liquid limit device, hand operated, Bakelite base.

STANDARDS: CNR/UNI 10014 - NF P94-051

Weight: 3 Kg

S171

Liquid limit device, hand operated, hard rubber base.

STANDARDS: ASTM D4318 - AASHTO T89 - BS 1377

Weight: 3 Kg

S172

Liquid limit device, motor operated, Bakelite base.

STANDARDS: CNR/UNI 10014 - NF P94-051

Power supply: 220-240 V 1ph 50 Hz

Weight: 4,5 Kg

S173

Liquid limit device, motor operated, hard rubber base.

STANDARDS: ASTM D4318 - AASHTO T89 - BS 1377

Weight: 4,5 Kg

ACCESSORIES:

S173-02 Rough brass cup, with central smooth band 10 mm wide, as requested by NF P94-051 Standard, used for soils having low plasticity

S173-03 Grooving tool, conforming to CNR/UNI 10014 - AASHTO T79 Specifications

S173-04 Grooving tool, conforming to ASTM D 4318 Specifications

S173-05 Grooving tool, conforming to NF P94-051 Specifications

S173-06 Grooving tool, conforming to BS 1377 Specifications

SPARE PART:

S173-01

Brass cup.



S178

Plastic limit

STANDARDS: ASTM D4318 - AASHTO T90 - BS 1377
UNI 10014 - NF P94-051

The plastic limit determines the lowest moisture content of a soil, by which a sample can be rolled into threads 3 mm. dia. without breaking the same neither longitudinally or transversely.

The set complete with carrying case comprises:

S178-01 Glass plate 300x250x10 mm

S178-02 Rod caliper 3 mm dia.

V114-03 Mixing porcelain dish 120 mm dia.

V192 Flexible spatula, 100 mm. blade

V122 Aluminium moisture tins dia. 55x35 mm. (6 pieces).

Weight: 5 Kg

V178-05

PLASTIC LIMIT, complete set, but without carrying case.

ACCESSORIES:

S178-06 Glass Plate 105x50 mm graduated each 10 mm with brass spacer 5 mm to measure the diameter of the soil sample to 3 mm \pm 0,5 according to NF P94-051

S179 Glass plate 500x500x10 mm

V300-17 Mercury, 1000 g

PROCTOR TEST: MOISTURE-DENSITY RELATIONSHIP

STANDARDS: ASTM D558, D559, D560, D698, D1557 - AASHTO T99, T134, T135, T136, T180 - BS 1377:4, 1924:2
UNI/CNR N° 69 - NF P94-093, P94-078 - DIN 18127

Proctor mould

Used for determining the relationship between the moisture content and density of compacted soils. Steel made, complete with mould body, collar and base; plated against corrosion.

MODELS:

Code	Description	Standards	Int. dia. mm	Body height mm	Volume ml	Weight Kg
SI85	Standard Proctor Mould	ASTM - AASHTO - NF UNI/CNR	101,6	116,4	944	8
SI86	Modified Proctor Mould	ASTM - AASHTO - UNI/CNR	152,4	116,4	2124	10
SI89	Split Standard Proctor Mould	ASTM - AASHTO - NF UNI/CNR	101,6	116,4	944	8
SI90	Split Modified Proctor Mould	ASTM - AASHTO - UNI/CNR	152,4	116,4	2124	10
SI90-01	Modified Proctor Mould	NF	152	152,5	2765	10,
SI90-02	Split Modified Proctor Mould	NF	152	152,5	2765	10
SI91	Standard Proctor Mould	BS	105	115,5	1000	8
SI94	Standard Proctor Mould	DIN	100	120	942	9
SI94-01	Modified Proctor Mould	DIN	150	125	2208	13
SI94-03	Split Standard Proctor Mould	DIN	100	120	942	9
SI94-04	Split Modified Proctor Mould	DIN	150	125	2208	13



SI85 ÷ SI94-04





PROCTOR RAMMER

Used to compact the soil sample into the mould. The spherical hand knob is from bakelite with metal screw and protection ring nut; guide sleeve with vent holes. Plated against corrosion.

MODELS:

Code	Description	Standards	Rammer dia. mm	Fall height mm	Rammer weight Kg	Total weight Kg
SI87	Standard Proctor rammer	ASTM - AASHTO UNI/CNR	50,8	304,8	2,495	6
SI87-01	Standard Proctor rammer	NF	50	304,8	2,495	6
SI92	Standard Proctor rammer	BS	50	300	2,5	6
SI88	Modified Proctor rammer	ASTM - AASHTO UNI/CNR	50,8	457,2	4,536	8
SI88-01	Modified Proctor rammer	NF	50	457,2	4,536	8
SI93	Modified Proctor rammer	BS	50	450	4,5	8
SI94-05	Proctor rammer	DIN	50	300	2,5	8
SI94-06	Proctor rammer	DIN	50	450	4,5	11
SI94-07	Proctor rammer	DIN	75	450	4,5	11

COMPACTION DISK

STANDARD: DIN 18127

Complete with rod and spherical knob. Plated against corrosion

MODELS:

SI94-09 Compaction disk dia. 99 mm, thickness 10 mm

SI94-10 Compaction disk dia. 149 mm, thickness 10 mm



SI87 ÷ SI94-07





S197

Vibrating compaction hammer

STANDARDS: BS 1377:4 - BS 1924:2

It provides an alternative method for the compaction of soil samples in the determination of dry density/moisture content relation (called Proctor), unconfined compressive strength of stabilized soils and CBR tests. This hammer is also used for the compaction of concrete specimens and asphalt in the percentage refusal density. Supplied without tampers and support frame which must be ordered separately.

Power supply: 220-240 V 1F 50/60 Hz 750 W

Weight: 8 Kg



ACCESSORIES:

S197-01

Supporting frame for vibrating hammer. Steel made, plated against corrosion.

Weight: 45 Kg

S197-02

Tamping foot 145 mm. dia. for CBR and Proctor tests.

Weight: 3 Kg

S197-03

Tamping foot for unconfined compression tests. Centering disk has a distance from the base of 50 mm.

Weight: 3,5 Kg

S197-04

Tamping foot, ditto, but with centering disk having distance from base of 100 mm.

Weight: 3,5 Kg

S197-05

Tamping foot, ditto, but with centering disk having distance from base of 150 mm.

Weight: 3,5 Kg

Determination of strength of stabilized soils

Preparation of materials bound with cementitious binders or aggregates mixes. Preparation by static compression of sand of fine grained soil specimens

STANDARD: NF P 98-230/2

MODELS:

S195-01 Mould dia. 50 by 122 mm to obtain specimen dia. 50 by 50 mm of fine and medium grained soils

S195-02 Mould dia. 50 by 172 mm. to obtain specimen dia. 50 by 100 mm of medium and coarse grained soils

S195-03 Base and upper piston dia. 50 by 36 mm

S195-04 Penetration and demoulding piston dia. 50 by 125 mm

S195-05 Penetration and demoulding piston dia. 50 by 175 mm

S195-06 Two displacing supports dia. 50 by 6 mm

S195-07 Two displacing supports dia. 50 by 12,5 mm

S195-08 Two displacing supports dia. 50 by 25 mm

S195-09 Collecting cylinder dia. 56 by 60 mm

S195-10 Collecting cylinder dia. 56 by 110 mm



**S198****Automatic universal CBR/Proctor compactor**

STANDARDS: ASTM D558, D560, D698, D1557, D1883
 AASHTO T99, T134, T135, T136, T180
 CNR/UNI 10009 - CNR N° 29, 69 - DIN 18127
 NF P94-093, P94-066 - BS 1377, 1924 - DUTCH
 UNE 7365, 7255

Designed to compact Proctor and CBR specimens, it ensures an extremely uniform degree of compaction with completely automatic test cycle through a program managed by microprocessor, according to the following Standards:

NF P94-093:	moulds dia. 4" = 25 blows and dia. 6" = 56 blows
NF P94-066:	mould dia. 6" = 100 blows
ASTM D1883:	moulds dia. 4" = 25 blows and dia. 6" = 56 blows
AASHTO T99, T180:	mould dia. 6" = 25 and 55 blows
BS 1377, 1924:	moulds dia. 105 mm = 27 blows and dia. 152 mm = 30, 62 blows
DIN 18127:	moulds dia. 100 mm = 25 blows and dia. 150 mm = 22, 59 blows
UNE 103-501-94:	mould dia. 6" = 60 blows
UNE 7365, 7255:	moulds dia. 4" = 26, 60 blows and dia. 6" = 55 blows
CNR/UNI 10009:	mould dia. 6" = 12, 26, 56 blows
CNR N° 69:	moulds dia. 4" = 25 blows and dia. 6" = 56 blows
CBR N° 29:	mould dia. 6" = 85 blows
DUTCH RAW:	mould dia. 4" = 25 blows and dia. 6" = 56 blows
DUTCH EPP:	mould dia. 6" = 40 blows
DETCH EPP:	mould dia. 6" = 20 blows

The blows are distributed automatically as requested by relevant Standards, with turntable rotation and rammer displacement through photoelectric cell sensors and microprocessor. The digital control panel is separate from the machine and can be fixed to the wall or mounted on a bench.

The compactor accepts moulds dia. 4" and 6" (100 and 150 mm) both Matest made or of other producers, thanks to its universal mould's fixing system.

Rammer drop height can be selected at 12" or 18" (300 or 450 mm)
 Rammer drop speed: 1 blow each 2 seconds

The machine is supplied **"without rammers"** which must be ordered separately and selected according to the desired Standard (the rammers are interchangeable)

Power supply: 220-240 V 1F 50 HZ 500 W

Dimensions: 550x360x1700 mm

Weight: 240 Kg

S198-01**Automatic universal CBR/Proctor compactor**

Identical to mod. S198 but equipped with Safety Guards to 89/392/CEE Directive

**S198-01****ACCESSORIES:**

S198-11 ASTM, AASHTO Standard Rammer; Ø 2" weight 2490 g

S198-12 ASTM, AASHTO Standard Rammer; Ø 2" weight 4540 g

S198-13 BS, DIN, UNE Standard Rammer; Ø 50 mm weight 2500 g

S198-14 BS, DIN Modified Rammer; dia. 50 mm and weight 4500 g

S198-15 CNR/UNI Standard Rammer; Ø 51 mm and weight 2495 g

S198-16 CNR/UNI Standard Rammer; dia. 51 mm and weight 4539 g

S198-17 NF Standard Rammer; dia. 50,4 and weight 2490 g

S198-18 NF Modified Rammer; dia. 50,4 mm and weight 4535 g

S198-19 UNE Modified Rammer; dia. 50 mm and weight 4540 g

S198-20 DIN Modified Rammer; dia. 75 mm and weight 4500 g

S198-05 Noise reduction cabinet to CE Directive, inside lined with sound-proofing material for noise reduction.

SPARE PARTS:

S198-22 Calibrated rod holding the rammer

S198-23 Set of devices fixing the mould to the table

CALIFORNIA BEARING RATIO - CBR

STANDARDS: ASTM D1883, D3668 - AASHTO T193 - CNR/UNI 10009 - UNE 103:502 - NF P94-078, P94-093 - BS 1377:4, 1924:2

This method has been developed by the California State Highway Department, and is now accepted by almost all the International Standards in force. The test is aimed to the evaluation of the bearing capacity of soil for flexible pavement design in road construction.

section S

S200-01... CBR SET TO ASTM, AASHTO, CNR/UNI, UNE STANDARDS



S201... CBR SET TO NF STANDARDS



S202... CBR SET TO BS STANDARDS



210

The equipment is available in different versions according to the various Standards in use:

Description	Standards	Standards	Standards
CBR mould complete with collar and perforated base: Dia. 6" (152,4 mm) x 7" (177,8 mm) height.....	ASTM, AASHTO CNR/UNI, UNE S200-01	NF P94-078 NF P94-093	BS 1377:4 BS 1924:2
Dia. 152 mm x 152 mm height		S201	
Dia. 152 mm x 127 mm height			S202
Split CBR mould with collar and perforated base: Dia. 6" (152,4 mm) x 7" (177,8 mm) height.....	S200-13		
Dia. 152 mm x 152 mm height.....		S201-01	
Dia. 152 mm x 127 mm height			S202-01
Solid base plate for CBR mould.....	S200-12	S201-12	S202-03
Filter screen, stainless steel dia. 149 mm mesh 0,150 mm (ASTM n° 100)	S200-02	S200-02	S200-02
Spacer disc with "T" handle: Dia. 5 15/16" (150,8 mm) x 2,416" (61,4 mm) height.....	S200-03		
Dia. 151 x 25,4 mm height.....		S201-02	
Dia. 151x36 mm height.....		S201-06	
Dia. 150x50 mm height.....			S202-07
Perforated (sweel) plate with adjustable stem	S200-04	S200-04	S200-04
Tripod (dial gauge support)	S200-05	S200-05	S200-05
Dial gauge 10 mm range, 0,01 mm subd.....	S376		
Dial gauge 25 mm range, 0,01 mm subd.....		S377	S377
Annular surcharge weight 2270 g.....	S200-07		
Annular surcharge weight 2300 g.....		S200-07	
Annular surcharge weight 2000 g.....			S202-08
Slotted surcharge weight 2270 g.....	S200-08		
Split surcharge weight 2300 g.....		S201-04	
Split surcharge weight 2000 g.....			S202-09
Cutting edge	S200-09	S200-09	S200-09
Compaction rammer: Ø 50,8, mm fall height 457,2 mm, weight 4,54 Kg.....	S188		
Ø 50, mm fall height 457,2 mm, weight 4,54 Kg.....		S188-01	
Ø 50, mm fall height 450 mm, weight 4,5 Kg.....			S193
Straight edge 300 mm long with curving rim.....	S200-11	S200-11	S200-11
Filter paper dia. 150 mm (pack of 100).....	S200-14	S200-14	S200-14
Soaking tank 600x400x400 mm.....	S201-05	S201-05	S201-05



The CBR equipment is cadmium plated against corrosion.

CBR TESTING MACHINES

STANDARDS: ASTM D1883, D3668 - BS 1377:4, 1924 - AASHTO T193 - CNR/UNI 10009 - NF P94-078

Used to load the penetration piston into the soil sample at a constant rate of 1,27 mm/min (1 mm/min to BS Spec.), and to measure the applied loads and piston's penetrations at determined intervals.

Matest proposes a wide range of machines: hand operated, motorized, dual speed, universal multispeed; load measurement by load ring, or by electric load cell and digital unit with X/Y graphic recorder of load/penetration through RS 232 port to PC.

section S

S209

CBR loading machine, hand operated, laboratory model

Load is applied through a mechanical jack and handwheel.

Upper beam can be adjusted in height.

Foreseen of fast approach device of the base plate.

The machine is supplied complete with:

- Load Ring 50 kN capacity, calibrated with relevant Calibration Certificate
- Penetration piston
- Dial gauge with dial gauge holder

Dimensions: 430x380x1180 mm

Weight: 80 Kg



S209

S210

CBR loading machine, hand operated, field model

Load is applied through a mechanical jack and handwheel.

This mechanical jack can be used also for in-situ CBR test (see mod. S220).

Upper beam can be adjusted in height.

The machine is supplied complete with:

- Load Ring 50 kN capacity, calibrated with relevant Calibration Certificate
- Penetration piston
- Dial gauge with dial gauge holder

Dimensions: 420x370x1180 mm

Weight: 65 Kg



S210

ACCESSORIES:

S210-02

CBR RATE INDICATOR for CBR hand operated machines.

Used to apply the correct rate of 1,27 mm/min penetration Recommended by LCPC, NF Spec.

Power supply:

220-240 V 1ph 50 Hz



S374

BRAKE DEVICE, it holds the max. applied load on the dial gauge of the load ring, with manual zero setting

The CBR Hand Operated testing machines S209 and S210 can be fitted with accessories for Unconfined or Compression tests, load rings of different capacity etc. See "Accessories" at pag. 215

S211**CBR loading machine motorized, 50 kN
ASTM version**

Load is applied through a screw jack driven by an electric motor at a constant penetration rate of 1,27 mm/min achieved by a built in gear box and assured also under load.

Upper beam can be adjusted in height.

Foreseen of fast approach device of the base plate and electric end of stroke switches of the load plate to save the machine from wrong manipulations.

The machine is supplied complete with:

- Load Ring 50 kN capacity, calibrated with relevant Calibration Certificate
- Penetration piston
- Dial gauge with dial gauge holder

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

Dimensions: 430x380x1180 mm

Weight: 98 Kg

S211

**S211-01****CBR loading machine motorized, 50 kN
BS version**

Identical to mod. S211, but with penetration rate of 1 mm/min. to BS 1377:4 Specifications.

ACCESSORIES per mod. S211 e S211-01

S374 BRAKE DEVICE, it holds the max. applied load on the dial gauge of the load ring, with manual zero setting.

S374-01 STOP SAFETY DEVICE, electrical, fixed on the load ring for automatic stop to the machine when reaching the max. capacity load of the ring, so as to prevent any overload damage.

S213**CBR/Marshall two speeds load frame, 50 kN
ASTM version**

Suitable to perform both CBR and MARSHALL tests.

The frame is provided of two fix speed ranges, easily selectable by a gear:

1,27 mm/min. for CBR tests

50,8 mm/min for Marshall tests.

Upper beam can be adjusted in height.

Foreseen of electric end of stroke switches of the load plate to save the machine from wrong manipulations.

The machine is supplied "without" load ring and accessories which have to be ordered separately (see accessories pag. 215)

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

Dimensions: 450x400x1200 mm

Weight: 130 Kg

S213-01**CBR/Marshall two speeds load frame, 50 kN
BS version**

Identical to mod. S213, but with penetration rate for CBR test of 1 mm/min. to BS 1377:4 Specifications



S213



S212

Universal multi-speeds load frame

This motorized machine with electronic digital control by micro-processor is suitable to perform all the tests where the requested speed rate is within 0,5 to 63 mm/min. with max. load of 50 kN. It can therefore perform:

- Unconfined test with rate of 0,635 mm/min
- CBR test with rate of 1 mm/min (BS Standards)
- CBR test with rate of 1,27 mm/min (ASTM, CNR/UNI, NF, AASHTO)
- Marshall test with rate of 50,8 mm/min.
- Duriez test with rate of 60 mm/min (NF French Spec.)

The speed rate is infinitely variable, easily and promptly selected.

Upper beam can be adjusted in height.

Foreseen of electric end of stroke switches of the load plate to save the machine from wrong manipulations.

The machine is supplied "without" load ring and accessories which have to be ordered separately (see accessories pag. 215)

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

Dimensions: 650x500x1350 mm

Weight: 180 Kg

S212



S214

CBR/Marshall two speed "digital" load frame, 50 kN

ASTM version

The frame is the same as for mod. S213, but the load is measured by an electric 50kN load cell with high precision strain transducers; the deformation (flow) is measured by a displacement transducer 50 mm stroke and +/- 0,1% linearity.

The digital display unit with microprocessor (technical details: see mod. B044, pag. 46) measures and displays at the same time the load (stability) in kN and the deformation (flow) in mm with pick hold features with the possibility to transfer them to a PC and printer through a RS232 port.

Dimensions: 800x400x1200 mm

Weight: 145 Kg

S214



S214-01

CBR/Marshall two speed "digital" load frame, 50 kN

BS version

Identical to mod. S214, but with penetration rate for CBR test of 1 mm/min. to BS 1377:4 Specifications.

**S215****Universal multi-speeds “digital” load frame**

The frame is the same as for mod. S212, but the load is measured by an electric 50kN load cell with high precision strain transducers; the deformation is measured by a displacement transducer 50 mm stroke and +/- 0,1% linearity.

The digital display unit with microprocessor (technical details: see mod. B044 pag. 46) measures and displays at the same time the load (stability) in kN and the deformation (flow) in mm with pick hold feature with the possibility to transfer them to a PC and printer through a RS232 port.

Dimensions: 950x500x1350 mm

Weight: 195 Kg



S215

ACCESSORIES for the Frames mod. S212, S213, S214 and S215 to perform:

CBR tests:

- S212-01** Penetration piston
- * **S376** Dial gauge 10 mm travel x 0,01 mm subd.
- * **S212-03** Dial gauge holder
- * **S370-09** Load Ring 50 kN capacity
- * **S374** Bracket device on load ring
- * **S374-01** Stop safety device

MARSHALL tests:

- S212-05** Load piston
- B046** Stability mould, cast aluminium alloy
- * **B047** Flow meter
- * **B047-01** Dial gauge for flow meter
- * **S370-07** Load Ring 30 kN capacity
- * **S374** Bracket device on load ring
- * **S374-01** Stop safety device

UNCONFINED tests:

- S212-08** Upper compression plate, 100 mm dia.
- * **S212-09** Dial gauge holder
- * **S376** Dial gauge 10 mm travel x 0,01 mm subd.
- * **S370-02** Load Ring 2 kN capacity
- * **S374** Bracket device on load ring
- * **S374-01** Stop safety device

DURIEZ tests:

Equipment required for CBR tests, and in addition: Duriez Equipment dia. 80 mm (see pag. 65)

* Note: only for mod. S212 and S213

ACCESSORY for mod. S214, S214-01 and S215 :

B043-01

Software for “X/Y” Stability/Flow graphics: see section Bitumen, pag. 45



S220

In-situ CBR test set

STANDARDS: BS 1377:7, 1924:2 - ASTM D1883, D4429
AASHTO T193 - CNR/UNI 10009

Used to determine quickly and efficiently the bearing capacity of soils on road constructions, foundations, road subgrades etc.

The set consists of:

Mechanical jack 50 kN capacity

Load ring 40 kN capacity

CBR penetron piston

Set of adaptors and holders

Set of extension rods: 2x100 mm, 1x300, 600, 1000 mm

Datum bar 2 m long with two tripods

Dial gauge 25x0,01 mm

Slotted surcharge weights 4,5 and 9 Kg. and annular 4,5 kg

Wooden carrying case

Weight: 80 Kg approx.

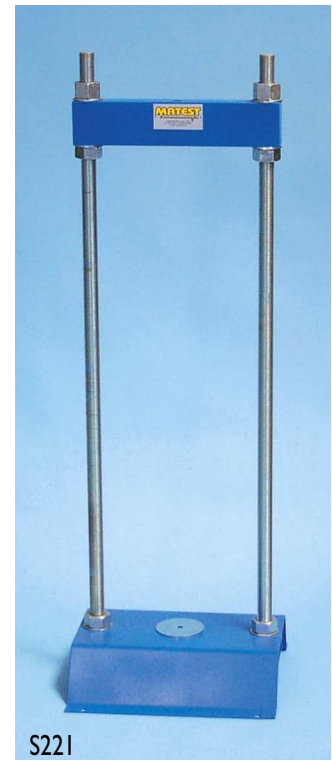


S220

S221

Conversion frame,

for laboratory CBR tests, by using part of the components of the S220 in-situ set.



S221



S221-01

S221-01

Mechanical jack, 50 kN capacity, hand operated through handwheel.



STATIC LOADS ON PILES

STANDARD: ASTM D1153

This equipment is utilized for static axial compressive loads on piles and special foundation structures tests to verify their bearing under known loads, and with accurate and sensitive value measurements. The complete set consists of a loading ram 2000 kN or 3000 kN capacity, motorized or hand operated hydraulic pump with reservoir, precision manometer with max. loading pointer, flexible pipe connector, 2 mt. long, large spherical seat assuring a valid contact with the contrasting structure. The stroke of the piston is 55 mm. approx.

MODELS:

S228

Hydraulic loading equipment, 2000 kN

capacity, hand operated

Weight: 100 Kg

S228-01

Hydraulic loading equipment, 3000 kN

capacity, hand operated

Weight: 140 Kg

S228-03



S228-02

Hydraulic loading equipment, 2000 kN

capacity, motorized.

Power supply: 220-240 V Iph 50 Hz 750 W

Weight: 130 Kg

S228-03

Hydraulic loading equipment, 3000 kN

capacity, motorized.

Power supply: 220-240 V Iph 50 Hz 750 W

Weight: 170 Kg

S238

Relative density of cohesionless soils

STANDARDS: ASTM D4253 - D4254

The equipment consists of: vibrating table 762x762 mm, actuated by a vibrator of 3600 rpm. with adjustable amplitude.

Relative density mould sets 0,1 and 0,5 cu.ft., cylindrical shape, complete with two guide sleeve with clamp assembly, two surcharge base with handle, two surcharge weights.

Dial gauge with measuring device.

Power supply: 220-240 V Iph 50 Hz

Weight: 250 Kg approx.



S238

PLATE BEARING TEST

STANDARDS: ASTM D1194, D1195, D1196 - BS 1377:9 - CNR N° 92, N° 146 - UNE 7391 - DIN 18134

This test is performed for the determination of the bearing capacity of a soil in-situ on road constructions, foundations, road subgrades, airport and highway pavements.

A wide range of plate bearing test equipment are available, together with many accessories according to the different Standards and specific enduser needs:

S222

Plate bearing test equipment 100 kN capacity - 1 dial gauge model

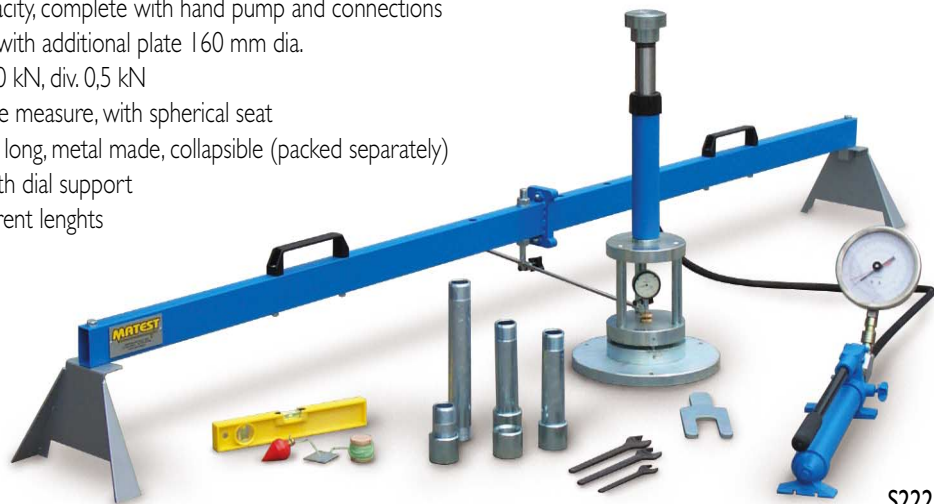
STANDARD: CNR N° 146, Method "A"

Consisting of:

- Hydraulic jack 100 kN capacity, complete with hand pump and connections
- Bearing plate 300 mm dia. with additional plate 160 mm dia.
- Pressure gauge range 0-100 kN, div. 0,5 kN
- Device for centre dial gauge measure, with spherical seat
- Datum bar assembly 2,5 m long, metal made, collapsible (packed separately)
- Dial gauge 25x0,01 mm with dial support
- Set of extension rods, different lengths
- Plumb bob and spirit level

Carrying case

Weight: 60 Kg approx.



S222

S223

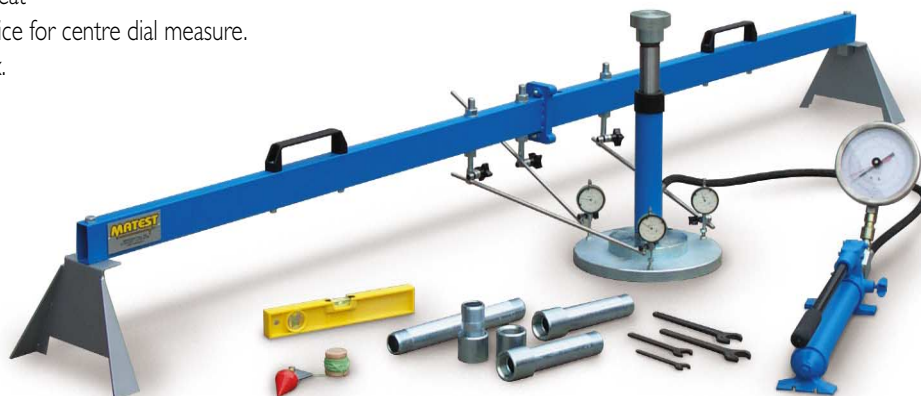
Plate bearing test equipment 100 kN capacity - 3 dial gauges model

STANDARD: CNR N° 146, Method "B" - BS 1377:9

Identical to mod. S222, but with 3 dial gauges 25x0,01 mm complete with dial holders, for three-points measurements of the plate, and upper spherical seat

Supplied without device for centre dial measure.

Weight: 60 Kg approx.



S223

ACCESSORY for mod. S222 and S223

S223-01

PRESSURE GAUGE range 0-50 kN, div. 0,25 kN with large dial dia. 200 mm, complete with fast connector; used for accurate readings at low loads, as for ex. pre-load of 0,5 Kg/cm²



S223-01



**S225****Plate bearing test equipment 200 kN capacity - 3 dial gauges model**

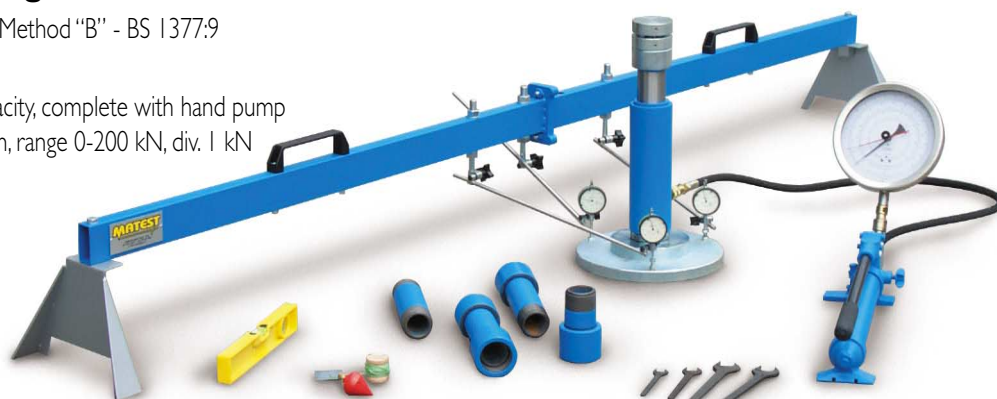
S225

STANDARD: CNR N° 146, Method "B" - BS 1377:9

Identical to mod. S223 but:

- Hydraulic Jack 200 kN capacity, complete with hand pump
- Pressure gauge dia. 200 mm, range 0-200 kN, div. 1 kN

Weight: 70 Kg approx.

**S226****Plate bearing test equipment 500 kN capacity - 3 dial gauges model**

STANDARD: CNR N° 146, Method "B" - BS 1377:9

Identical to mod. S223 but:

- Hydraulic Jack 500 kN capacity, complete with hand pump
- Pressure gauge dia. 200 mm, range 0-500 kN, div. 2 kN

Two carrying cases.

Weight: 110 Kg approx.



S226 + S226-01 + S226-02 + S226-03 + S226-10

ACCESSORIES for mod. S225 and S226, to meet:
CNR N° 92 - ASTM D1195, D1196 Standards

- S226-01** Loading plate dia. 450 mm
- S226-02** Loading plate dia. 600 mm
- S226-03** Loading plate dia. 760 mm
- S226-10** Set of extension rods to get the datum bar assembly 5,5 m long

ACCESSORIES for all the models of Plate Bearing test equipment:

- S226-04** Loading plate, square 305x305 mm
- S226-07** Loading plate dia. 254 mm
- S226-08** Loading plate dia. 309,1 mm

SPARE PARTS:

- S226-11** Datum bar assembly 2,5 m long, metal made, collapsible
- S226-12** Device for centre dial gauge measure
- S226-05** Loading plate dia. 300 mm
- S226-06** Loading plate dia. 160 mm
- S226-13** Upper spherical seat for 100 kN and 200 kN models
- S226-14** Upper spherical seat for 500 kN model

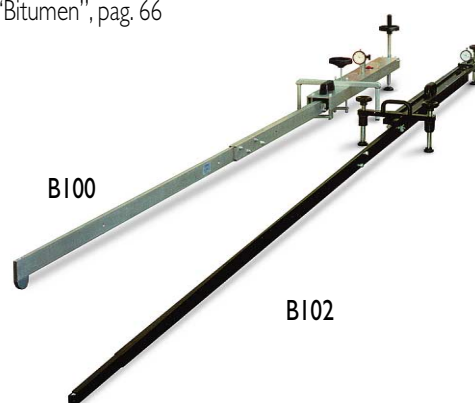
- S226-15** Articulated dial gauge support
- S377** Dial gauge 25x0,01 mm

Benkelman beam apparatus

STANDARDS: NF P94-117 - NF P98-200/2

Utilized in conjunction with the plate bearing test equipment, to determine the static deformation of road pavements EV1 - EV2 and Westergard.

See section "Bitumen", pag. 66





220

S230

Balloon density apparatus, 1600 ml capacity

STANDARDS: ASTM D2167 - AASHTOT205 - CNR N° 22

Used to determine the in-situ density of fine graded compacted or bonded soil. The apparatus is placed over the hole excavated in the soil, and water is pumped into a rubber balloon and forced into the hole. The amount of water displaced into the balloon is measured from the graduation of the scale.

The instrument consists of a graduated plexiglass cylinder 1600 ml capacity housed within an aluminium alloy casting, a rubber pump with stop valve, a density plate and 12 rubber balloons.

Dimensions: 340x340x700 mm

Weight: 8 Kg

SPARE PART:

S230-01

Rubber balloons, pack of 12



S232

Balloon density apparatus, 3000 ml capacity

STANDARD: NF P94-061-2

Used to determine the in-situ density of fine graded compacted or bonded soil, this unit has the same test system of mod. S230, but with a capacity of 3000 ml as requested by French Specification. A hand-driven piston forces the water into the rubber membrane. A dial gauge measures the water pressure so to execute all the test at the same pressure.

An index engraved on the stem of the piston measures the volume of water filling the hole.

The unit is supplied complete with 6 reinforced rubber membranes, 4 locking clamps, base plate, accessories.

Dimensions: 360x360x700 mm

Weight: 10 Kg

SPARE PART:

S232-01

Reinforced rubber membrane, pack of 6



S233

Balloon density apparatus, 6000 ml capacity

Identical to mod. S232, but with capacity of 6 litres.

Weight: 18 Kg

SPARE PART:

S233-01

Reinforced rubber membrane, pack of 6

ACCESSORIES, used for levelling, digging, collecting and maintaining the soil samples:

S240-01 Scraper to level the ground

S240-02 Metal dibber tool

S240-05 Metal pointed rod

VI95 Rubber mallet 50 mm dia.

VI93 Steel hammer 300 g

VI94 Steel hammer 2 Kg.

VI99 Density pick

VI98 Chisel 300 mm long x 25 mm wide

VI86 Density spoon, big sized

VI88 Trowel, 100x200 mm

VI83 Aluminium scoop 325 cc

VI25-02 Tinned can 5 litre cap.



**S234****Sand density cone apparatus
dia. 6 1/2" (165,1 mm)**

STANDARDS: ASTM D1556 - AASHTO T191 - CNR N° 22
UNE 7371, 83109

Used to determine the in-situ density of fine grained compacted soil. The test consists in digging a hole into the ground and then collect, dry and weight the sampled soil. The hole is than filled with dry sand from the cone container. The apparatus consists of a steel double metal cone with valve, two plastic 5 litre jars, metal base with centre hole.

Plated against corrosion.

Dimensions: 305x305x600 mm Weight: 6 Kg

ACCESSORY:

S234-01 Calibrating container

SPARE PARTS:

S234-05 Metal double cone assembly
with valve

S234-06 Metal base with centre hole

V121 Plastic jar, 5 litre

S231**Sand density cone apparatus
dia. 12" (305 mm)**

Identical to mod. S234 but with cone diameter of 12" (305 mm), recommended for coarse grained soil and gravel (over 38 mm diameter)

Weight: 20 Kg

ACCESSORY:

S231-01

Calibrating container

**S236****Sand replacement apparatus dia. 100 mm**

STANDARDS: BS 1377:9, 1924:2

Used to determine the in-situ density of fine grained compacted soil. The apparatus consists of: sand pouring cylinder dia. 100 mm with shutter made of cast aluminium and accurately machined, upper cylinder; metal tray with centre hole, calibrating container.

Weight: 10 Kg

**S237****Sand replacement apparatus dia. 200 mm**

Identical to mod. S236 but having cone dia. 200 mm, recommended for coarse grained soil and gravel.

Weight: 24 Kg

ACCESSORY FOR MOD. S231, S234, S236, S237:

S235 STANDARD SAND for density tests, passing 600 micron and retained on 300 micron. Bag of 50 Kg





Constant head permeameters

STANDARDS: BS 1377:5 - ASTM D2434 - AASHTO T215

Used to determine the permeability of granular, gravel and sand soils. The specimen is formed in an acrylic permeability cell, and water is passed through it from a constant level tank.

The permeability cell has pressure points at different levels which are connected to the manometer tubes fixed on a stand with graduated scale. Two constant head permeability cells are available: 75 mm and 114 mm diameter.



S245-01

Constant head permeability cell

75 mm dia., with three pressure take-off points.

Formed by an acrylic plexiglass body held between two aluminium anodized end plates.

Weight: 3 Kg

S245-02

Constant head permeability cell

114 mm dia., with six pressure take-off points and an additional six blanked-off pressure points. Formed by an acrylic plexiglass body held between two aluminium anodized end plates. When using this cell, two manometer tube stands mod. S245-03 are required. Weight: 7 Kg

S245-03

Manometer tubes and stand

comprising three tubes of constant bore, graduated scale, tubing and connectors.

Dimensions: 210x50x1160 mm

Weight: 5 Kg

S245-04

Constant level tank, made from acrylic plexiglass, wall mounting. The inlet, outlet and overflow pipes can be adjusted for height within the tank.

Weight: 3 Kg

S246

Falling head permeameter

Used to determine the permeability of clay-like or silty soils. The specimen is confined within the permeameter which is connected to the manometer tube filled with water. The sample must be completely saturated with water before the test, and the operator will check the rate of fall of the water in the tube passing through the test specimen.

The set consists of:

- Manometer tubes and stand with three tubes each dia. 3, 4 and 6 mm for the different degrees of permeability
- Permeameter dia. 4" complete with perforated plates and stainless steel gauze (mod. S252)
- Soaking reservoir with cock
- Tubing and connectors

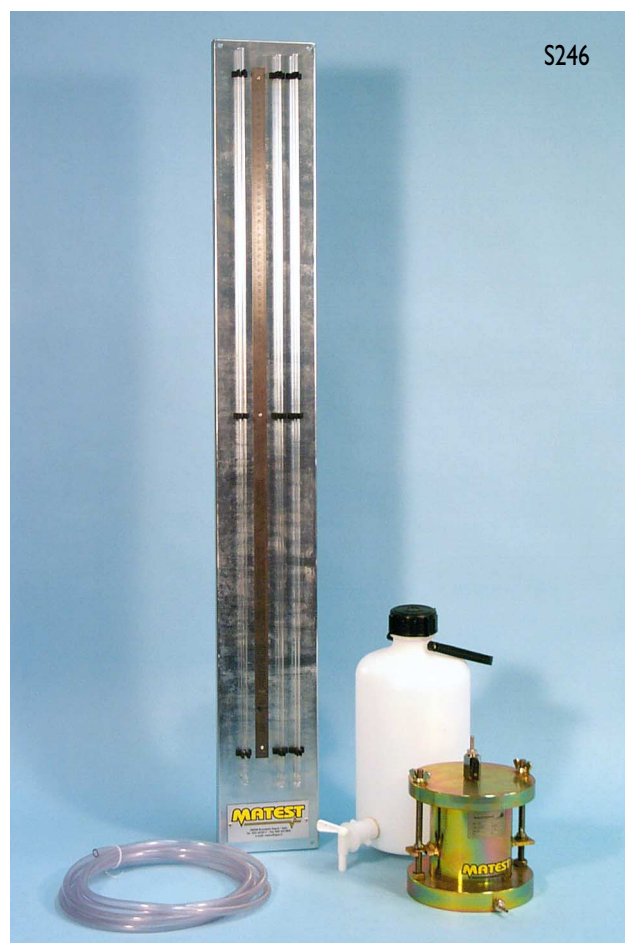
Weight: 18 Kg

ACCESSORIES:

S253 Permeameter dia. 6" complete with perforated plates and stainless steel gauze

S355 De-airing tank 20 litre capacity made from acrylic plexiglass (see pag. 235)

V203 Portable vacuum pump, 220-240V 1ph 50 Hz



S248**Permeameter stand for constant and falling head tests**

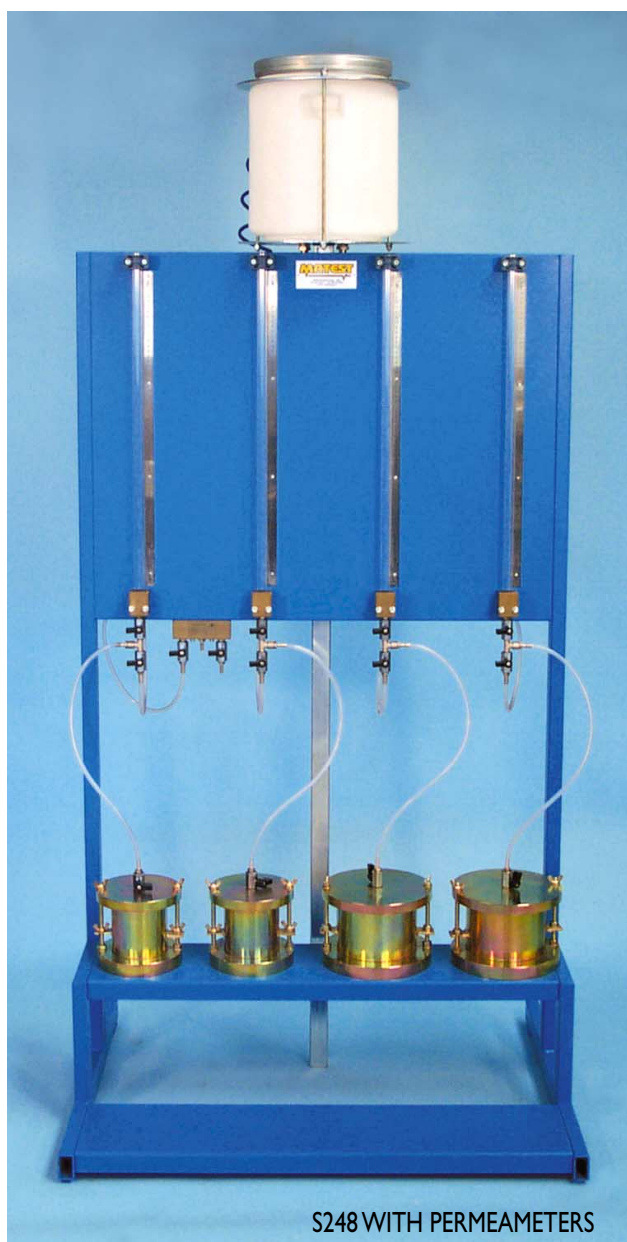
This 4 cells capacity stand is designed to perform both constant head and falling head permeability tests on compacted granular soil samples.

The stand consists of a metal frame with water tank adjustable in height between 1350 and 3450 mm. Supplied complete with tubes, graduated rules, piping, connectors and cocks; but without permeameters to be ordered separately.

The stand can hold up to 4 permeameters having dia. 4", 6" and 12" to perform different types of tests at the same time.

Dimensions: 1050x900x2000/3850 mm

Weight: 75 Kg



S248 WITH PERMEAMETERS

COMPACTION PERMEAMETERS

Used for determining permeability to water of soil gravel, clay, sand samples.

Supplied complete with clamped upper and lower plate giving the possibility to perform permeability tests also on compacted samples, water inlet with valve, water outlet, two perforated upper and lower plates, two stainless steel screens.

Stell made, plated against corrosion.



MODELS:

S252**Compaction permeameter 4" dia.**

(as a Proctor Standard mould). Weight: 8 Kg

S253**Compaction permeameter 6" dia.**

(as a CBR or Proctor Modified mould). Weight: 16 Kg

S254**Compaction permeameter 12" dia. (305 mm).**

Weight: 38 Kg



CONSOLIDATION TEST

The one-dimensional consolidation test of a soil sample enables to ascertain the settlement characteristics over a given period of time. The soil specimen under test is axially loaded and laterally contained.

Loads are applied with progressive increases and the settlement values are read on a dial gauge.

S260

Front loading oedometer (consolidation apparatus)

STANDARDS: ASTM D2435, D4546 - BS 1377:6 - UNE 7392
AASHTO T216

Rigidly manufactured from aluminium alloy casting to provide a high degree of accuracy with minimum frame distortion.

The beam provides three loading ratios: 9:1 10:1 11:1 and the beam assembly is fitted with an adjustable counterbalance weight. Maximum load: 9000 kPa on 20 cm² (Ø 50,47 mm) specimen using 11:1 beam ratio.

The oedometer accepts cells up to 100 cm², and it is supplied without: consolidation cell, weights, dial gauge, holding bench which have to be ordered separately.

Weight: 40 Kg

ACCESSORIES:

HOLDING BENCH, made from sturdy structural painted steel, complete with locking bolts and nuts.

S265 Bench holding one apparatus

S265-01 Bench holding three apparatuses

S260 WITH ACCESSORIES



S265

Consolidation cells - fixed ring

Made from brass, with specimen holding fixed ring having cutting rim so as to be utilized also to sample undisturbed specimens. Accurately manufactured these cells are supplied complete with loading piston, couple of porous stones and plexiglass transparent water jacket.

Model	Specimen diameter mm	Specimen area cm ²	Specimen thickness mm	Spare cutting ring mm	Specimen tamper	Spare couple of porous stones
S268	50,47	20	20	S122	S123	S274
S268-01	71,40	40	20	S122-01	S123-01	S274-01
S268-02	79,80	50	20	S122-02	S123-02	S274-02
S268-03*	112,80	100	25	S122-03	S123-03	S274-03

*The consolidation cell dia. 112,8 mm is made from aluminium.



The hollow punch (cutting ring) and the tamper are used to sample undisturbed soil samples. The hollow punch has one cutting rim and it is utilized also as ring body of the cell.

Consolidation cells with permeability attachment

Similar in manufacture to the fixed ring cells, they are also provided of a pipe connector with cock and graduated glass burette 10 ml capacity allowing to perform permeability tests.

Model	Specimen dia. mm	Specimen area cm ²	Specimen thickness mm	Hollow punch	Tamper	Spare couple of porous stones
S272	50,47	20	20	S122-04	S123	S274-04
S272-01	71,40	40	20	S122-05	S123-01	S274-05
S272-02	79,80	50	20	S122-06	S123-02	S274-06
S272-03*	112,80	100	25	S122-07	S123-03	S274-07

*The consolidation cell dia. 112,8 mm is made from aluminium.

The hollow punch has one cutting rim and is used to sample specimens and to introduce them directly into the cell with undisturbed method.

S275

Permeability attachment, complete with stand, clamps and hose it is connected to the cells mod. S272 to S272-03. Recommended for soil samples having great value of permeability. Burette has 50 ml capacity and subdiv. 0,1 ml.

Weight: 5 Kg

S273

Set of 50 kg. of slotted weights for Oedometer, formed by:

4x10 Kg. - 1x5 Kg. - 2x2 Kg. - 1x1 Kg

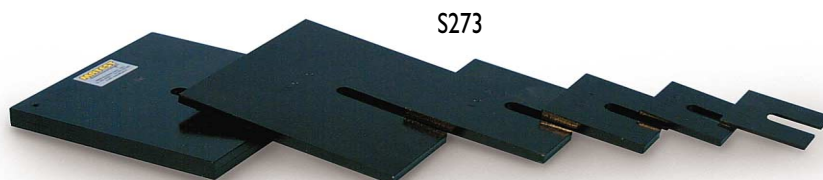
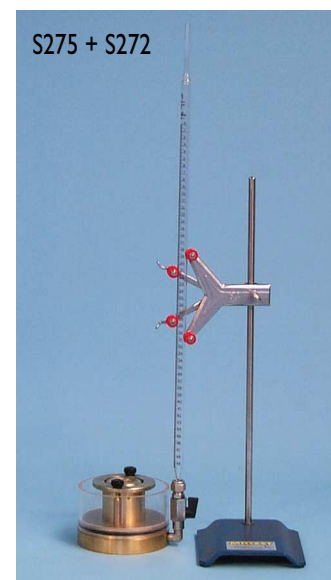
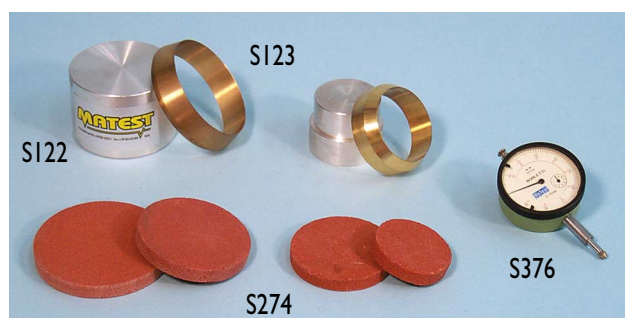
Steel made, painted against corrosion.

SLOTTED WEIGHTS, available models:

S273-06	250	g
S273-05	500	g
S273-04	1	Kg
S273-03	2	Kg
S273-07	4	Kg
S273-02	5	Kg
S273-08	8	Kg
S273-01	10	Kg
S273-09	16	Kg

S376

Dial gauge 10 mm travel x 0,01 mm subd.



Data acquisition and processing system

An alternative to the dial gauge measurement, it is possible to equip the Oedometer with electronic displacement transducer connected to the data acquisition unit complete with suitable software. See mod. S349 and S361, pag. 237



S280

DIRECT/RESIDUAL SHEAR TEST APPARATUS

STANDARDS: ASTM D3080 - BS 1377:7

Used to determine the resistance to shearing of all types of soil specimens both consolidated and drained, undisturbed or remoulded samples.

The machine can accommodate specimens dia. 50, 60, 100 mm and square 60x60, 100x100 mm.

The operating and control system is fully digital by microprocessor.

The equipment performs continuous tests of the selected speed with range between 0,00001 to 9,9999 mm/min. with the possibility to maintain the load capacity (5000 N) on the whole speed range.

At the beginning of each test, the machine performs a complete internal check, a position reset with the elimination of all possible errors in the positioning and all pauses.

The input of test patterns is achieved by the interaction of the keyboard and the alphanumeric display with self-memory, thus granting infinitesimal resolutions in short times.

All data are input and stored when the machine is not working, without affecting the specimen under test with quick machine setting.

Possibility to fix a maximum excursion of the shear box, so as to interrupt automatically the test.

It is possible to input a different return speed (Residual shear) in relation to the one used for the shear test, thus allowing a quick playback to select the residual shear test, saving a lot of time.

section S



226



S280 + S282

Technical features:

- RS 232 output for connection to PC
- Display of both speed and displacement with 0,00001 mm resolution
- Shear speed between 0,00001 to 9,99999 mm/min.
- Max shear effort: 5000 N possible on the whole speed range
- Possibility of direct vertical load, or with a lever arm ratio 10:1
- Max. vertical direct load: 500N, or with lever arm: 5500N
- Display and pilot lamps to signal any bad functioning and alarms
- Box group mounted on ball track with high quality antifriction system
- Read value results are immediate and of extreme accuracy
- Extremely easy and practical use, not requiring any experienced operator

The machine is supplied complete with beam loading device 10:1 ratio, load ring 3000 N capacity, set of 50 Kg. of slotted weights, gauges for vertical load and horizontal displacement; but without shear box; hollow punch and tamper to be ordered separately.
Power supply: 220-240V 1ph 50 Hz 100 W
Dimensions: 1200x550x1100 mm
Weight: 150 Kg

ACCESSORIES:

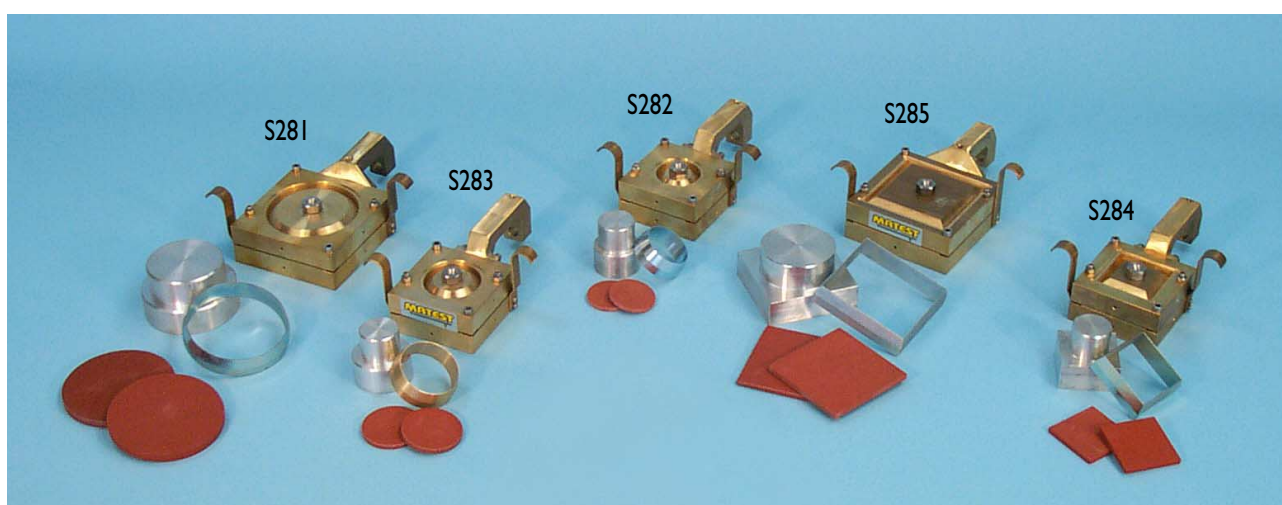
Shear box assemblies, made from brass, accurately machined, complete with carriage, walled round or square hole, base plate, two grids, two perforated grids, two porous stones, adapters to fit the box holder.

Models:	Shear box	Spare couple of porous stones
Round specimens dia. 50 mm	S282	S286-03
Round specimens dia. 60 mm	S283	S286
Round specimens dia. 100 mm	S281	S286-04
Square specimens 60x60 mm	S284	S286-01
Square specimens 100x100 mm	S285	S286-02

Hollow punch (sample cutter) and **Tamper** (extrusion tool)

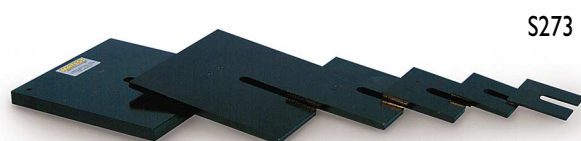
The hollow punch with cutting rim is used to prepare the soil sample, and the tamper ejects the specimen filling it directly into the shear box without disturbing it.

Models:	Hollow punch	Tamper
Dia. 50 x h 25 mm	S122-08	S123-08
Dia. 60 x h 25 mm	S122-09	S123-09
Dia. 100 x h 25 mm	S122-10	S123-10
Square 60x60 x h 25 mm	S122-11	S123-11
Square 100x100 x h 25 mm	S122-12	S123-12



SPARE PARTS:

S273 Set of 50 Kg. of slotted weights formed by: 4x10 Kg - 1x5 Kg - 2x2 Kg - 1x1 Kg
Steel made, painted against corrosion

**Load Rings,**

complete with connector and calibration certificate

S370 Capacity 500 N

S370-01 Capacity 1000 N

S370-02 Capacity 2000 N

S370-03 Capacity 3000 N (spare part)

S370-04 Capacity 5000 N

Slotted weights, available models:

S273-06	250	g
S273-05	500	g
S273-04	1	Kg
S273-03	2	Kg
S273-07	4	Kg
S273-02	5	Kg
S273-08	8	Kg
S273-01	10	Kg
S273-09	16	Kg

S376 Dial gauge 10x0,01 mm for vertical load

S377 Dial gauge 25x0,01 mm for horizontal displacement





S290

Consolidation frame, it accepts up to 3 shear boxes or consolidation cells.

Used to apply a constant load on the specimen in the shear box, so as to shorten the test duration when a lot of specimens have to be tested and just few shear machines are available.

The frame can also be used to consolidate oedometric cells.

Produced in a rugged steel structure, it is supplied complete with three lever arms ratio 10:1 having each max. load up to 550 Kg., centering devices and dial gauge holders.

Supplied without weights, water container, cells and dial gauges to be ordered separately.

Dimensions: 2300x450x900 mm

Weight: 150 Kg approx.



S290 WITH ACCESSORIES

ACCESSORIES:

S291 WATER CONTAINER, made from plexiglass and aluminium, it accommodates the shear box during the consolidation test, by keeping the specimen deep into the water.

Weight: 4 Kg

S273 Set of 50 Kg. of slotted weights

S376 Dial gauge 10x0,01 mm

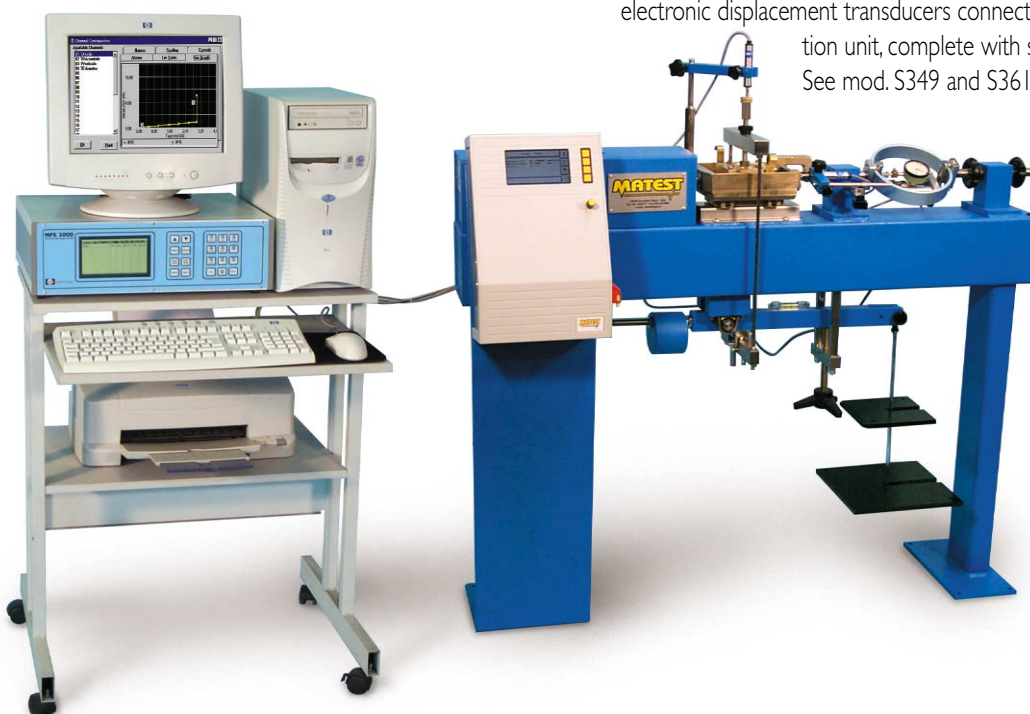
S291



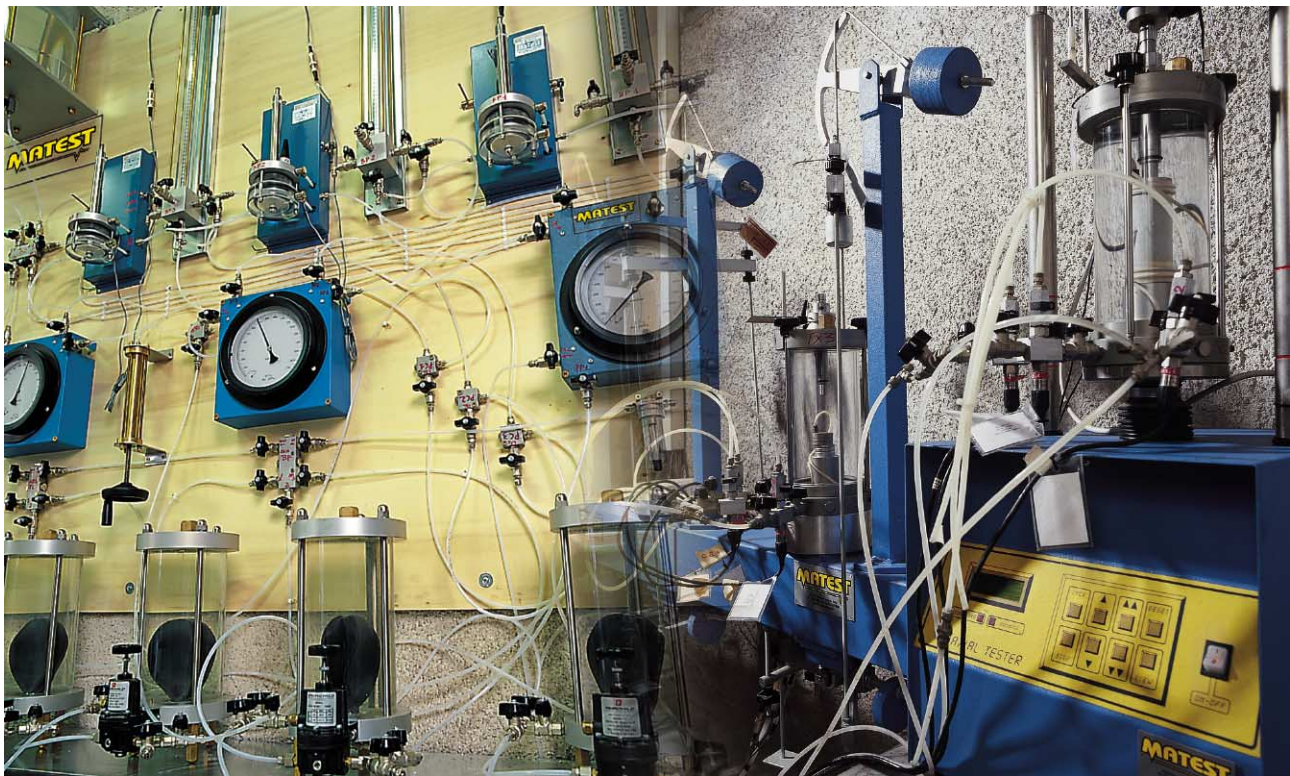
Data acquisition and processing system

As an alternative to the load ring and dial gauges measurements, it is possible to equip the shear machine with electric load cell and electronic displacement transducers connected to the data acquisition unit, complete with suitable software.

See mod. S349 and S361, pag. 237



TRIAXIAL TESTS



section S



229

INTRODUCTION

The application of local loads or pressures on soils determine the deformation, the settlement and the yield of the same. Triaxial tests are normally made to determine the relationship between these loads and the consequent deformations, in order to establish the soil shear strength.

The triaxial tests are made to evaluate:

- Excavation works
- Design of bridges, earth dams, trestle bridges
- Slope stability
- Piled foundation works, anchored walls
- Bearing allowable load capacity for shallow foundations.

An undisturbed soil sample is gradually stressed up, in order to change its condition from null to the maximum shear strength at its breaking.

The soil sample, previously placed in a rubber membrane to avoid any drainage, and placed in the triaxial cell, is subjected to a constant consolidation pressure and to a load/buckling to a known constant speed, through one press.

The triaxial tests can be performed in some different ways; among the most known are the following:

“UU” - Unconsolidated, undrained tests

Determines the shear strength in undrained conditions. No structural variation is allowed. When pressure in the cell has achieved, no specimen volume decrease is allowed. The same specimen is then stressed up to the failure.

Load and settlement values of the specimen, normally required

to evaluate the soil, features in the foundation works, bearing, piled foundations, diaphragms, shear angle, slopes stability, can be determined.

“CU” - Consolidated, isotropic undrained test

Determines the shear strength and enables the volume variation of the specimen up to the stabilization of the consolidation pressure. During the failure, the water drainage from the specimen is stopped and the pore pressure is measured, owing to the increase of the axial load.

“CU” test is performed to define the cohesion parameters and long-term angle of friction (strength values of foundation soils) and to evaluate improved applications of preconsolidation, tempering, compacting, excavations.

“CD” - Consolidated, isotropic drained test

Determines the shear strength and the angle of friction and enables to the specimen the volume variation during the axial load.

The test execution is very slow, in order to avoid the increase of the pore pressure inside the specimen.

This kind of test reproduces, in the best ways, the different geotechnical aspects and soil conditions and is particularly indicated to evaluate sandy or highly permeable soils.



230

S301

Digital triaxial load frame - 50 kN

STANDARDS: ASTM D2850 - BS 1377:8

This sturdy construction machine has been developed to meet all the requirements of a soil laboratory.

Thanks to its large structure it can accommodate all standard Triaxial Cells for testing soil specimens up to 100 mm. dia. by 200 mm. length.

Machine is very simple; the test feed speed can easily be set thanks to a microprocessor and conversation system with alphanumeric display and keyboard with self-learning.

Infinitesimal resolutions are, in this way, granted in real time.

The machine comprises limit switch of position security upper and lower platen.

- Maximum load capacity 50kN
- Infinitesimal testing speed from 0,00001 to 6 mm.min.
- Speed accuracy: $\pm 0,5\%$
- RS 232 port for connection to PC
- Vertical daylight: 0-790 mm. (0-530 mm. with ring)
- Distance between columns: 305 mm
- Platen diameter: 177 mm
- Power supply: 220-240V 1ph 50 Hz 750 W
- Dimensions: 420x580x1410 mm
- Weight: 105 Kg

Note: The machine is supplied complete with load piston and sphere, but without proving rings, triaxial cell, dial gauges which must be ordered separately.

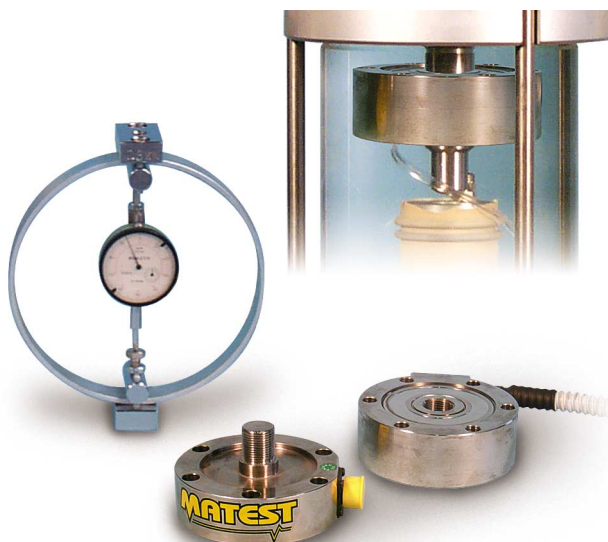
Data acquisition and processing system

As an alternative to the load ring and dial gauges measurements, it is possible to equip the triaxial system with electric load cell and electronic axial strain transducers connected to the data acquisition unit, complete with suitable software.

See mod. S349 and S361, pag. 237



S301 WITH ACCESSORIES



MEASUREMENT OF THE IMPOSED LOAD OF THE TRIAXIAL MACHINE THROUGH:

- Load rings: see pag. 246
- Summersible electric load cells: see pag. 240
- Electric load cells: see pag. 239

TRIAXIAL CELLS

The top and low caps are made from aluminium corodal alloy.
The cell cylinder is manufactured from high resistant clear acrylic material.
Easily assembling and disassembling through quick clamping rods.
The load piston is finely worked to reduce as much as possible the friction during the slip.
The base of the cell includes four valves:
back pressure, low drainage, pore pressure, cell pressure inlet.
Supplied complete with an adjustable dial gauge or displacement transducer holder to measure the axial deformation of the specimen.

Note: The triaxial cell is supplied without accessories like: caps, plinths, membranes, membrane sealing rings, porous stones, dial gauges, etc. which must be ordered separately.

Models:	S305	S306
Max. specimen size mm	Ø 70x140	Ø 100x200
Max. cell pressure	1700 kPa	1700 kPa
Overall dimensions mm	Ø 280x480	Ø 310x540
Weight Kg	8	16



Note: cell mod. S305 can be also used for specimens dia. 50x100 and 38x76 mm. with accessories of suitable diameter. Cell mod. S306 can be also used for specimens dia. 70x140, 50x100 and 38x76 mm. with accessories of suitable diameter.

ACCESSORIES FOR TRIAXIAL CELLS:

	Ø 38x76 mm	Ø 50x100 mm	Ø 70x140 mm	Ø 100x200 mm
Rubber membrane (pack of 10)	S310	S310-01	S310-02	S310-03
Membrane sealing ring (pack of 10)	S311	S311-01	S311-02	S311-03
Membrane stretcher	S312	S312-01	S312-02	S312-03
Slipt former	S313	S313-01	S313-02	S313-03
Top cap with drain	S314	S314-01	S314-02	S314-03
Plinth	S315	S315-01	S315-02	S315-03
Porous disc (2 pcs)	S316	S316-01	S316-02	S316-03
Perspex plain disc (2 pcs)	S317	S317-01	S317-02	S317-03
"O" ring for plinth	S318	S318-01	S318-02	S318-03
Filter paper drain (50 pcs)	S319	S319-01	S319-02	S319-03
Filter paper for base (100 pcs)	S320	S320-01	S320-02	S320-03
Stainless core cutter	S122-13	S122-14	S122-15	S122-16
Extraction plate	S123-13	S123-14	S123-15	S123-16



S310 ÷ S331



232

ACCESSORIES FOR TRIAXIAL CELLS (follows):

- S321** Drain burette, 10 ml. cap.
- S322** Drain burette, 50 ml. cap.
- S325** Nylon tube dia. 6x4 (25 mt.)
- S326** Terminal for connection tube (10 pcs)
- S327** Flaring tool
- S328** Vaseline oil (1 Kg)
- S329** Water-repellent grease (1 Kg)
- S330** Grease pump
- S331** Null displacement valve (spare)
- S377** DIAL GAUGE, 25x0,01 mm sens. for specimens up to dia. 50x100 mm
- S379** DIAL GAUGE, 50x0,01 mm sens. for specimens from dia. 70x140 mm

RUBBER MEMBRANE, to become the specimen waterproof.

MEMBRANE SEALING RING, to block the membrane on the top cap of the plinth.

MEMBRANE STRETCHER, to stretch the membrane and make the specimen lock easier, avoiding to disturb it.

SPLIT FORMER, to prepare non cohesive soil specimens like sand. Made of aluminium, it is composed by two halves.

TOP CAP WITH DRAINAGE, for load homogeneous application on the whole section of the specimen. Made of anodized aluminium, complete with connector.

PLINTH, in aluminium used to adapt the triaxial cell to the specimen diameter.

POROUS DISCS, in phosphor bronze, to filter and uniformly distribute water on the whole section of the specimen. Two pieces are required each cell.

FULL DISC, in perspex, with 10 mm. thickness, to place into the plinth and top cap replacing the porous disc, used for undrained tests. Two pieces are required each cell.

FILTER PAPER, for lateral drain on short permeability specimens like clays, etc.

FILTER PAPER, to avoid the soil clog in the porous stones during the test.

CORE CUTTER, to cut, in the predetermined diameter, soil cohesive samples having higher dimensions. Made from stainless steel and cutting edge.

PLATE, to extrude the specimen from the core cutter.

DRAINAGE BURETTE, to prepare non cohesive specimens applying negative pressure to the base of the specimen and to measure the drainage inside and outside the specimen during the test with specimen open to the atmosphere. Two models are available: 10 ml.

for specimens up to 70 mm. dia. and 50 mm. for specimens 100 mm. dia. Supplied complete with cell rod and couplings.

“O” RING, to facilitate the clamping of the membrane sealing ring to the membrane, avoiding to disturb the soil specimen.

TOOL, to cut and prepare the ends of the nylon connection tubing in order to be fixed to the suitable connector.

DIAL INDICATORS, to measure the deformation of the sample during the axial load tests.

Pressure measuring panel

Used to measure the cell pressure, the back pressure and other pressure measurements.

The panel is composed by a metallic support with, inside an accurating gauge dia. mm. 200, having scale 0-1700 kPa.

TWO MODELS ARE AVAILABLE:

S340

Pressure measuring panel at 4 inlet/outlet null displacement valves. Supplied complete.

Dimensions: 410x350x110 mm

Weight: 6 Kg



S340



S341

S341

Pressure measuring panel at 8 inlet/outlet null displacement valves which enable the best versatility for connecting the pressure of the system, of the pressure measuring points and of the different units, commonly used (screw pump, vacuum pump, de-airing water tank, mercury gauge, etc.) Supplied complete.

Dimensions: 410x460x110 mm

Weight: 8 Kg

S345

Screw pump, connected to the pressure measuring panel, is used to measure and to balance the pore pressure indicated by the null indicator; to create and to measure the cell pressure and the back pressure.

Weight: 3 Kg

**S345****S348**

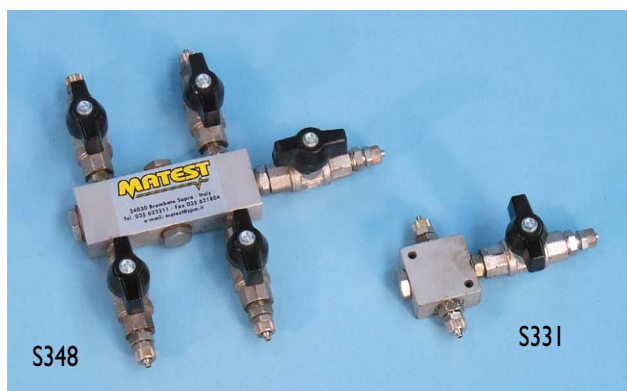
Distribution panel, delivers water or pressure to various systems.

Provided with 5 inlet/outlet valves with null variation of volume.

Assembled on an aluminium support.

Dimensions: 200x200x55 mm

Weight: 3 Kg

**S348****S331****VOLUME CHANGE MEASUREMENT**

Used to measure the continuous volume changes, during triaxial tests.

Composed by a measuring burette, cap. 100 ml. and 0,2 ml. sens., placed inside a perspex tube, reversing valve and by-pass valve which allows to exclude the volume change measurement.

**S357****S358**

MODELS:

S357**Single burette apparatus**

Dimensions: 180x270x860 mm

Weight: 4 Kg

S358**Double burette apparatus**

Dimensions: 230x270x860 mm

Weight: 5 Kg





234

S356

Differential mercury manometer, scale: -100 kPa +100 kPa

The measure of low, positive and negative pore pressures, effected with standard manometers dia. 200 mm., does not result sufficiently accurate. The use of a mercury manometer offers a simple and effective system in order to take, accurately, the low pressures. Composed by a "U" manometer full of mercury, calibrated for directed kPa readings. Mounted on metallic panel to fix on a wall. Complete with TRAP for mercury, collects the eventual mercury pushed out from the manometer. Supplied without mercury.



S356

ACCESSORY:

V300-17

MERCURY, pack of 1 Kg

S350

Air/Water pressure system,

to distribute pressure water up to 1700 kPa. Simple, practical and extremely accurate to select tests pressure, it can also offer the possibility to further system expansions. The cell membrane enables the use of deaerated water. A suitable compressor, which can grant a pressure source, is necessary for using the air/water membrane cell.

The cell set includes a high pressure air inlet attachment, a high accurate regulator which enables to set the work pressure and 4 valves for pressure water outlet, water and air drain.

Maximum pressure 1700 kPa

Dimensions: 270x300x425 mm

Weight: 9 Kg



S350

ACCESSORY:

S350-03

Filter unit, composed by filtering device and interchangeable cartridge. Complete with fixing holes.

SPARE PARTS:

S350-01

Two-way distribution valve for air or water

S350-04

Membrane for air/water cell.

Pack of 2 pieces.

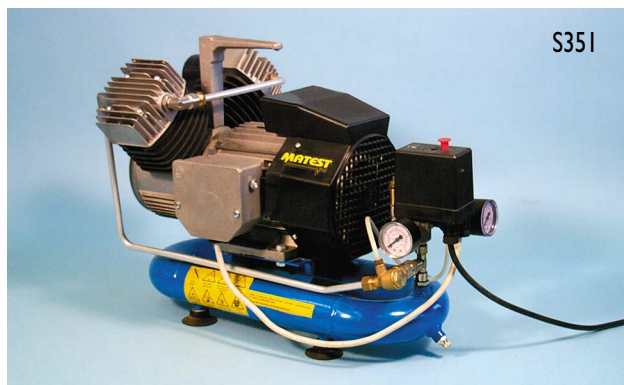
S351

Laboratory air compressor, max. pressure 17 bar, to be used with the air/water membrane cell. Supplied complete with tubings and couplings for cell connection.

Dimensions: 520x310x400 mm

Power supply: 220-240 V 1 ph 50 Hz

Weight: 35 Kg



S351

A145

Oil/Water constant pressure system

This unit provides an infinitely variable constant pressure from 0 to 3500 kPa by using a motorized hydraulic pump, an oil/water interchange vessel, piston/spring, valves, high viscosity oil. Supplied without test pressure gauge.

Power supply: 220-240V 1 ph 50 Hz

Weight: 20 Kg

ACCESSORY:

A145-01 Gauge 0-3500 kPa for pressure test



A145



235

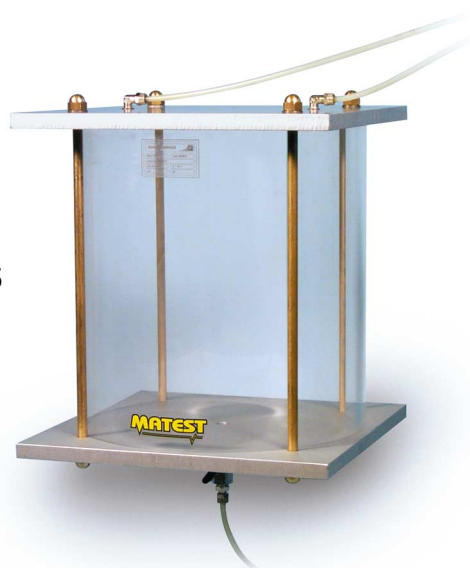
S353**Null Indicator**

Used as a balancing device to measure the pore pressure of the specimen.

The unit is made from acrylic material, and is realized in one piece only; assembled on the triaxial cell, avoiding eventual tubing expansions.



S355

**S355**

De-airing tank, connected to the vacuum pump, it produces de-airing water; specially used to measure the pore pressures. Consists of a perspex cylinder where a spray water inlet and an air outlet is fitted.

Water, coming into the spray, is leaked inside the cylinder; while a vacuum pump is connected with an air outlet.

The outlet of the de-airing water is placed in the lower part of the tank.

Tank capacity: 20 litres.

Dimensions: 320x320x520 mm

Weight: 15 Kg

ACCESSORIES:

V204

VACUUM PUMP, portable, one stage, it produces a final vacuum of 730 mm/Hg

Volume sucked: 5 Cu-m/h

Power supply: 220-240 V 1ph 50 Hz

Dimensions: 260x220x190 mm

Weight: 12 Kg

S355-01

WATER TRAP collects condensed water.

S359**Three-place consolidation load frame**

Used to apply a constant load to the piston of the triaxial cell.

Load can be applied through a hanger with a direct ratio: 1:1, or through lever with ratio 5:1.

Maximum load of 250 Kg. each place.

The frame, resistant metallic construction, accepts up to 3 triaxial cells and is provided with suitable centering plate cells.

Supplied without cells, weight and dial gauges, which must be ordered separately.

Dimensions: 2300x400x1800 mm

Weight: 150 Kg

ACCESSORIES:

S273 Set of slotted weights 50 Kg.

S377 Dial gauge 25 mm. stroke and 0,01 mm. div. for specimens up to dia. 50x100

S379 Dial gauge 50 mm. stroke and 0,01 mm. div. for specimens from dia. 70x140



S359 WITH ACCESSORIES

DATA ACQUISITION & PROCESSING

INTRODUCTION:

In a world where everybody is pushed for time and technology is growing at a rapid rate our Data Acquisition System, which has been specially designed for the modern laboratory, whether for commercial purposes, or teaching purposes is second to none. This system is so versatile you can customise it to your requirements by ordering the modules you require and adding to the system at a later date as you expand.

section S

General advantages offered by the system:

- Low cost and high productivity yield.
- Elimination of human error.
- Logging enables greater utilisation of man power.
- Elimination of overtime - Hence wages kept to a minimum.
- User friendly windows software.



236



- Can control our load frame and pressure controls - Hence complete automation and control of test.
- Complete and accurate management of test data.
- Live data displayed on logger display as well as computer.
- Password protected channel calibration with Linearisation.
- Data can be exported into excel if required.

The computer required should have the following specification:

- Pentium III, 400 MHz or higher
- Windows 98
- 64 Meg Ram or higher
- 17" SVGA colour screen
- 2 serial and 1 parallel ports
- BUS mouse
- At least 20 mega bytes of free hard disc space.

Advantage of the host acquisition software program:

- Complete and accurate management of test data.
- Printing of test data or download to PC.
- Live data displayed on logger display as well as computer.
- Password protected channel calibration with linearisation.
- Data can be exported into excel.

Advantage of processing software programs:

- Results calculated and processed without having to analyse results separately.



**S349****4-Channel analogue data logger**

Simple to use four channel stand alone data logging system, it is the ideal solution for small laboratories as this can come as a logger or as a read-out unit.

Data collection for tests such as Triaxial, Oedometer and Shear can be fully automated.

Configuring the system is made easy by using a 4x4 membrane keypad and a 4x20 character LCD display.

The system provides number of functions to facilitate the use:

On-board battery backed memory for data storage and calibration

Real time clock with battery backup

Upto 250 readings per channel with time stamp

Logging mode includes:

- Linear; configurable from 1 sec to HH:MM:SS
- Logarithmic times
- Square root times

Automatic triggering of logging process:

- Delay, configurable from 1 second to HH:MM:SS
- Greater than a reference channel value

View logged data

Password protected configuration and calibration

Transducer excitation supply of $\pm 5V$ dc

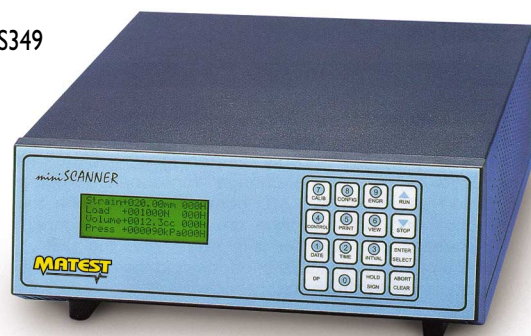
RS232 serial interface for computer or Printer

Printout of logged data

Power supply: 110-240V 1ph 50/60 Hz

Main features include:

- Up to 64 input channels, and up to 64 tests can be run fully independently
- Automatic data collection
- Fast logging (10 readings/second) capability for Marshall tests
- Automatic test start and stop conditions
- User programmable time intervals for data collection
- On board large graphics display and keypad
- Menu driven command selection
- Battery backed data storage and real time clock
- Non-volatile storage of channel calibration data
- On screen live displays of graph and data tabulation
- Built in transducer excitation supply
- Supplied with host acquisition software Windows program, (unless processing software is purchased)

S361**S349****SPECIFICATIONS:**

Analogue channel input:..... LSCT, pressure or load cell
(0-1000 mV)

Transducer excitation supply:..... +5 / -5V DC

Digital channel:..... Digital dial gauge input (can be used for load, strain or volume).

Local display:..... Large graphics display
(240x128 pixels)

Key pad:..... 20 Key.

Data storage: Up to 12000 readings for a single channel test.

Host PC link:..... Via RS232, 9600 baud, 8 data bits and 1 stop bit.

Network link:..... Via RS232, 19200 baud, 8 data bits and 1 stop bit.

Power supply:..... 110-240V 1ph 50/60 Hz.

Dimensions: 150x450x370 mm.

Weight: 8 Kg

S361**Data acquisition system**

Ideally suited to the soil mechanics laboratories, these state of the art data loggers are simple to use and flexible in operation.

Furthermore these systems can make a considerable improvement in laboratory productivity and cost effectiveness by automating test data collection. The laboratory technician can perform other duties whilst the test is being conducted.

The data logger is supplied without any channel signal conditioning or A to D processing.

Channels are added by inserting modular cards or net working junction boxes.



EXPANSION MODULES

S361-01

8-CHANNEL INTERNAL ANALOGUE CARD, enables the S361 system to be used with 8 analogue inputs (S362 to S362-02 linear strain transducers). The S361 system can accept a maximum of four S361-01 cards.

N° 4 X S361-01



S361-02

EXTERNAL ANALOGUE MODULE (junction box), which enables four additional analogue inputs to be used with the S361 system. A maximum of eight S361-02 modules can be used with the S361 system. Each S361-02 module requires daisy chain cable. Please refer to mod. S361-11 to S361-14.

S361-03

EXTERNAL DIGITAL MODULE (junction box), which enables the S361 system to be used with S362-30 to S362-35 digital gauges. Each S361-03 module accepts up to four S362-30 to S362-35 digital gauges. Each S361-03 module requires a daisy chain. Please refer to mod. S361-11 to S361-14 range of cables.

The S361 system can use a maximum of eight S361-03 modules; i.e. 32 digital channels.

Explanation of analogue & digital

An analogue channel reading is where you would use a load cell, linear strain transducer or pore pressure transducer and the logger has to convert the measurement into a digital signal to display or process the measurements taken. Analogue readings are affected by temperature and external electrical noise.

A digital reading is generated by an optical method that reads measured intervals, hence a direct reading in mm/inches is produced on the digital gauge and thus requires no calibration.

Note:

Any combination of the external analogue and digital modules can be connected to the S361 system with a maximum of 8 external modules. Each module will require one of the following extension cables, to be used with external module whether digital or analogue:

S361-11 Cable 10 metres long

S361-12 Cable 5 metres long

S361-13 Cable 3 metres long

S361-14 Cable 1 metres long

There are 2 ports on the S361 logger, which accept the above cables. It is possible to connect a maximum of 25 metres of cable to each port.

ANALOGUE MEASUREMENT DEVICES

Linear strain transducers:

- Input required is 10 volts dc, output is typically 65 mV full output
- Non-linearity better than $\pm 0,1\%$ of full scale deflection
- High resolution
- Strain gauge devices extremely accurate and reliable
- Very low spring force on spindle
- Stainless steel casing
- Operating temperatures between 0 and 70 Deg C



MODELS:

S362 Linear strain transducer 10 mm travel

S362-01 Linear strain transducer 25 mm travel

S362-02 Linear strain transducer 50 mm travel

All models come complete with a calibration certificate.

Extension cables for the linear strain transducers:

S362-21 Cable 10 metres long

S362-22 Cable 5 metres long

S362-23 Cable 2 metres long

It is recommended not using more than 10 metres of extension cable with the linear strain transducers.



DIGITAL GAUGES

These CE marked digital gauges can be used as stand-alone units, or used with the S361 data logger via the 4-Channel external digital module S361-03. Our digital gauges can be fitted to most places where you would have a mechanical dial gauge or analogue measuring devices such as linear strain transducers. You can fit them in load rings, on our volume change apparatus or even items such as concrete compressometers. The application where they can be used is endless.

The advantages of the digital gauges over the linear Strain Transducers are:

- No temperature drift
- No calibration required (direct reading in mm)
- Local display (you do not need this with a linear strain transducer or load cells)
- Travel reverse
- Maximum hold function

Features:

- Inch-Metric display conversion
- Travel reverse
- Rotating bezel
- Low battery warning
- Large LCD display
- Maximum hold
- Accuracy: \pm one resolution
- Complete with 2 metres cable

MODELS:

- S362-30** Digital gauge 15 mm travel \times 0,002 mm
- S362-31** Digital gauge 15 mm travel \times 0,001 mm
- S362-32** Digital gauge 25 mm travel \times 0,002 mm
- S362-33** Digital gauge 25 mm travel \times 0,001 mm
- S362-34** Digital gauge 50 mm travel \times 0,002 mm
- S362-35** Digital gauge 50 mm travel \times 0,001 mm

NEEDED ACCESSORIES:

S361-03

EXTERNAL DIGITAL MODULE (Junction box) which enables the S361 to be used with the digital gauges.

S362-38

MOUNTING BLOCK for the digital gauges to the load rings.



SUBMERSIBLE TRIAXIAL LOAD CELLS

Designed for measuring compressive loads from 1 kN to 50 kN, connected to the S349 and S361 data logger they can be fitted into new or existing triaxial cells.

Manufactured from high quality materials, fully sealed waterproof device, with excellent inherent resistance to side forces.

Being insensitive to cell confining pressure, the load cell can be used inside the triaxial cell; the load also being measured within the cell eliminates the effect of piston friction.

Used as an alternative to the load rings or electric load cells.

Rated output: 2 mV/V nominal

Non-linearity: 0,05% FS

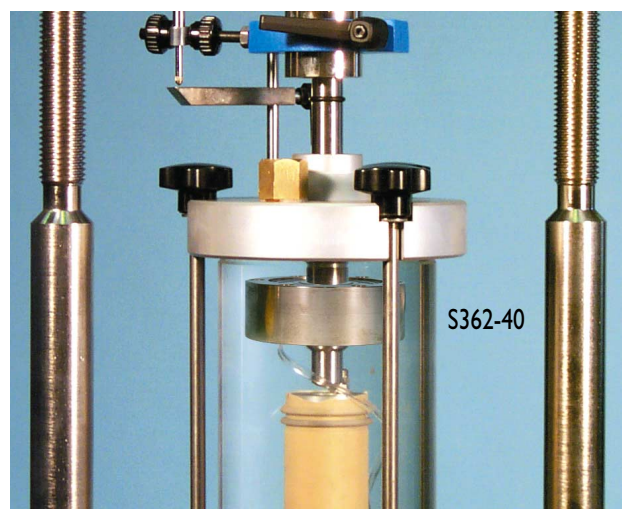
Hysteresis: 0,1% FS

MODELS:

- S362-40** Submersible load cell 1 kN capacity
- S362-41** Submersible load cell 3 kN capacity
- S362-42** Submersible load cell 5 kN capacity
- S362-43** Submersible load cell 10 kN capacity
- S362-44** Submersible load cell 25 kN capacity
- S362-45** Submersible load cell 50 kN capacity

ACCESSORIES:

- S362-48** Ram, 15,5 mm for the submersible load cell
- S362-49** Ram, 25 mm for the submersible load cell



ELECTRIC LOAD CELLS

Designed for measuring compressive loads, connected to the S349 and S361 data logger, as an alternative to the load rings or submersible load cells.

Rated output: 2 mV/V nominal

Hysteresis: 0,1% FS

MODELS:

S362-60 Load cell 2,5 kN capacity

S362-61 Load cell 5 kN capacity

S362-62 Load cell 10 kN capacity

C140 Load cell 25 kN capacity

C140-01 Load cell 50 kN capacity



S362-60 ÷ C140-01

PORE PRESSURE TRANSDUCERS

Suitable for pore pressure measurement but requires a de-airing block.

- Requires an input voltage of 10 volts dc, giving an output of up to 100 m Volts
- High accuracy and reliability
- Protected against corrosive pore water pressure
- Supplied with 2 metres of cable and 5 pin din plug
- Threaded 0,25 "BSP"
- Operating temperatures between 0 and 70° C.

MODELS:

S362-11

Pressure transducer
1000 kPa

S362-12

Pressure transducer
1700 kPa

ACCESSORY:

S362-15

De-airing block
for pore pressure
transducer



S362-11 ÷ S362-15

S362-05

Automatic volume change instrument

Specifically designed to use with our range of triaxial cells for continuous measurements of volume change during the test. The unit consists of a top volume change cylinder, which has a capacity of 100 ml and the bottom change over valve box, which provides unlimited capacity.

MAIN FEATURES:

- It can be used with digital dial gauge
- It can be used with LSCT transducer
- The accuracy is better than 0,1 ml
- Easy de-airing of top and bottom chamber
- Supplied with push fittings (6 mm) for easy connections, but without measurement device and mounting block.

Dimensions: 360x270x210 mm

Weight: 7,6 Kg

S362-05



S362-06

Volume change instrument

Designed to use with triaxial cells for measurements of volume change during the test.

The unit consists of a volume change cylinder with capacity of 100 ml.

It can be used with linear strain transducer, or digital dial gauge. Accuracy is better than 0,1 ml.

Easy de-airing of bottom and top chamber

Supplied without measurement device and mounting block

Dimensions: 180x180x240 mm

Weight: 4,7 Kg

ACCESSORIES to S362-05 and
S362-06 instruments:

S362-01

Linear strain transducer 25 mm
travel

S362-32

Digital gauge 25 mm travel x 0,002
mm (other models of digital gauge:
see pag. 239)

S362-38

Mounting block for the linear strain transducer

S362-39

Extension spindle to increase the length of the digital dial gauge
(S362-32) spindle.



S362-06



SOFTWARE FOR SOIL LABORATORIES

Our Windows based programs are specifically designed to use with S349 and S361 Data Loggers.

As most PC users are familiar with Windows, this makes the Software straight forward and easy to follow.

The acquisition software program mod. S363 provides an attractive and easy to use front end user interface for live monitoring and control, which allows the collected data to be download direct to a Printer or PC.

The processing software program mod. S364 are a collection of data processing packages for live monitoring and display of the following tests:

Triaxial, Oedometer, Direct Shear, Permeability; all programs comply with BS 1377:1990. These programs can be bought individually or as a group.

S363

ACQUISITION SOFTWARE PROGRAM (already included in mod. S361 data acquisition system). Main features include:

- Channel / Test configuration
- Password protected calibration
- Ten point linearisation
- Calibration printout
- Data export to popular spread sheets
- Individual channel view
- Test view
- Channel alarm view
- Live channel graphs and data table
- Logged data printouts

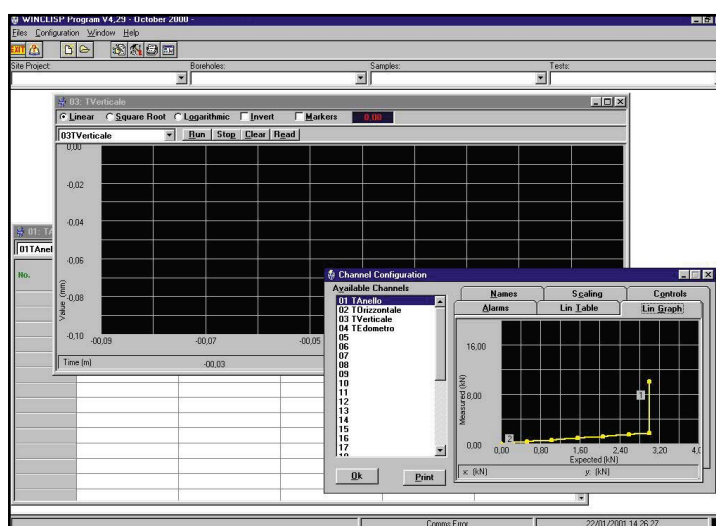
S364

Processing Software program for:

- Quick Undrained test
- Effective triaxial test
- Oedometer test
- Direct shear test
- Permeability test

Main feature include:

- Multiple job file support
- On-screen cursor measurements
- Live graphs and data table on all consolidation and stress/strain plots
- Complies with BS 1377:1990



S364-01

PROCESSING SOFTWARE PROGRAM FOR TRIAXIAL TESTS ONLY

S364-02

PROCESSING SOFTWARE PROGRAM FOR CONSOLIDATION (OEDOMETER) TESTS ONLY

S364-03

PROCESSING SOFTWARE PROGRAM FOR DIRECT SHEAR TESTS ONLY

S364-04

PROCESSING SOFTWARE PROGRAM FOR PERMEABILITY TESTS ONLY

COMPOSITION EXAMPLES OF COMPLETE TRIAXIAL EQUIPMENT

TYPE "A"

Triaxial system for **UU** tests (1 cell)
for specimens dia. mm 38

MANUAL DATA ACQUISITION

TYPE "B"

Triaxial system for **UU** tests (1 cell)
for specimens dia. mm 38

AUTOMATIC DATA ACQUISITION

section S



242

Model	Description	Q.ty	Model	Description	Q.ty
S301	Triaxial machine 50 kN cap.	1	S301	Triaxial machine 50 kN cap.	1
S377	Dial gauge, 25 mm. stroke	1	S370-02	Proving ring, 2 kN	1
S370-02	Proving ring, 2 kN	1	S370-04	Proving ring, 5 kN	1
S370-04	Proving ring, 5 kN	1	S305	Triaxial cell	1
S305	Triaxial cell	1	S315	Plinth	1
S315	Plinth	1	S314	Top cap	1
S314	Top cap	1	S317	Perspex porous disc (2 pcs)	1
S317	Perspex porous disc (2 pcs)	1	S310	Rubber membrane (10 pcs)	1
S310	Rubber membrane (10 pcs)	1	S311	Membrane sealing ring (10 pcs)	1
S311	Membrane sealing ring (10 pcs)	1	S318	"O" ring for plinth	1
S318	"O" ring for plinth	1	S312	Membrane stretcher	1
S312	Membrane stretcher	1	S313	Split former	1
S313	Split former	1	S323	Core cutter	3
S323	Core cutter	3	S324	Extraction plate	1
S324	Extraction plate	1	S340	Pressure measuring panel	1
S340	Pressure measuring panel	1	S345	Screw pump	1
S345	Screw pump	1	S350	Air/water constant pressure system	1
S350	Air/water constant pressure system	1	S350-03	Air filter unit	2
S350-03	Air filter unit	2	S351	Laboratory air compressor	1
S351	Laboratory air compressor	1	S355	De-airing tank	1
S355	De-airing tank	1	S350-01	Water distribution valve	3
S350-01	Water distribution valve	3	V204	Vacuum pump	1
V204	Vacuum pump	1	S325	Nylon tubing (25 m. coil)	1
S325	Nylon tubing (25 m. coil)	2	S327	Flaring tool	1
S327	Flaring tool	1	S362-02	Displacement trasducer 50 mm	1
S332	Set of suggested spares and wearable accessories	1	S362	Displacement transducer 10 mm	2
			S362-12	Pressure transducer 1700 kPa	1
			S362-15	De-airing block	1
			S362-22	Cable 5 metres long	3
			S349	4-channel analogue data logger	1
			S332-01	Set of suggested spares and wearable accessories	1

COMPOSITION EXAMPLES OF COMPLETE TRIAXIAL EQUIPMENT

TYPE "C"

Triaxial system for **UU, CU** and **CD** tests (1 cell)
for specimens dia. mm 38

MANUAL DATA ACQUISITION

Model	Description	Q.ty
S301	Triaxial machine 50 kN cap.	1
S377	Dial gauge, 25 mm. stroke	1
S370-02	Proving ring, 2 kN	1
S370-04	Proving ring, 5 kN	1
S305	Triaxial cell	1
S315	Plinth	1
S314	Top cap	1
S317	Perspex porous disc (2 pcs)	1
S316	Porous disk (2 pcs)	1
S310	Rubber membrane (10 pcs)	1
S319	Filter paper drain (50 pcs)	1
S320	Filter paper (100 pcs)	1
S311	Membrane sealing ring (10 pcs)	1
S318	"O" ring for plinth	1
S312	Membrane stretcher	1
S313	Split former	1
S323	Core cutter	3
S324	Extraction plate	1
S340	Pressure measuring panel	2
S345	Screw pump	3
S350-01	Two-way distribution valve	6
S357	Volume change device	1
S350	Air/water constant pressure system	2
S350-03	Air filter unit	2
S351	Laboratory air compressor	1
S355	De-airing tank	1
S348	Five-way distribution panel	1
V204	Vacuum pump	1
S325	Nylon tubing (25 m. coil)	3
S327	Flaring tool	1
S353	Null indicator	1
S356	Differential manometer	1
V300-17	Mercury 1 Kg.	1
S332-02	Set of suggested spares and wearable accessories	1

TYPE "D"

Triaxial system for **UU, CU** and **CD** tests (1 cell)
for specimens dia. mm 38

SEMI-AUTOMATIC DATA ACQUISITION

Model	Description	Q.ty
S301	Triaxial machine 50 kN cap.	1
S377	Dial gauge, 25 mm stroke	1
S370-02	Proving ring, 2 kN	1
S370-04	Proving ring, 5 kN	1
S305	Triaxial cell	1
S315	Plinth	1
S314	Top cap	1
S317	Perspex porous disc (2 pcs)	1
S316	Porous disk (2 pcs)	1
S310	Rubber membrane (10 pcs)	1
S319	Filter paper drain (50 pcs)	1
S320	Filter paper (100 pcs)	1
S311	Membrane sealing ring (10 pcs)	1
S318	"O" ring for plinth	1
S312	Membrane stretcher	1
S313	Split former	1
S323	Core cutter	3
S324	Extraction plate	1
S340	Pressure measuring panel	2
S345	Screw pump	2
S350-01	Two-way distribution valve	6
S357	Volume change device	1
S350	Air/water constant pressure system	2
S350-03	Air filter unit	2
S351	Laboratory air compressor	1
S355	De-airing tank	1
V204	Vacuum pump	1
S325	Nylon tubing (25 m. coil)	3
S327	Flaring tool	1
S349	4-channel analogue data logger	1
S362-02	Displacement transducer 50 mm	1
S362	Displacement transducer 10 mm	2
S362-12	Pressure transducer 1700 kPa	1
S362-15	De-airing block	1
S362-22	Cable 5 metres long	4
S332-03	Set of suggested spares and wearable accessories	1



COMPOSITION EXAMPLES OF COMPLETE TRIAXIAL EQUIPMENT

TYPE "E"

Triaxial system for **UU, CU** and **CD** tests (1 cell)
for specimens dia. mm 38

AUTOMATIC DATA ACQUISITION

TYPE "F"

Triaxial system for **UU, CU** and **CD** tests (3 cells)
for specimens dia. mm 38

MANUAL DATA ACQUISITION

section S



244

Model	Description	Q.ty	Model	Description	Q.ty
S301	Triaxial machine 50 kN cap.	1	S301	Triaxial machine 50 kN cap.	1
S370-02	Proving ring, 2 kN	1	S377	Dial gauge, 25 mm. stroke	4
S370-04	Proving ring, 5 kN	1	S370-02	Proving ring, 2 kN	1
S305	Triaxial cell	1	S370-04	Proving ring, 5 kN	1
S315	Plinth	1	S305	Triaxial cell	3
S314	Top cap	1	S315	Plinth	3
S317	Perspex porous disc (2 pcs)	1	S314	Top cap	3
S316	Porous disc (2 pcs)	1	S317	Perspex porous disc (2 pcs)	3
S310	Rubber membrane (10 pcs)	1	S316	Porous disc (2 pcs)	3
S319	Filter paper drain (50 pcs)	1	S310	Rubber membrane (10 pcs)	4
S320	Filter paper (100 pcs)	1	S319	Filter paper drain (50 pcs)	4
S311	Membrane sealing ring (10 pcs)	1	S320	Filter paper (100 pcs)	3
S318	"O" ring for plinth	1	S311	Membrane sealing ring (10 pcs)	3
S312	Membrane stretcher	1	S318	"O" ring for plinth	1
S313	Split former	1	S312	Membrane stretcher	1
S323	Core cutter	3	S313	Split former	1
S324	Extraction plate	1	S323	Core cutter	3
S340	Pressure measuring panel	2	S324	Extraction plate	1
S345	Screw pump	2	S340	Pressure measuring panel	3
S350-01	Two-way distribution valve	6	S345	Screw pump	5
S357	Volume change device	1	S350-01	Two-way distribution valve	18
S350	Air/water constant pressure system	2	S357	Volume change device	3
S350-03	Air filter unit	2	S350	Air/water constant pressure system	6
S351	Laboratory air compressor	1	S350-03	Air filter unit	2
S355	De-airing tank	1	S351	Laboratory air compressor	1
V204	Vacuum pump	1	S348	Five-way distribution panel	6
S325	Nylong tubing (25 m. coil)	3	S355	De-airing tank	1
S327	Flaring tool	1	S355-01	Water trap	1
S362-02	Displacement transducer 50 mm	1	V204	Vacuum pump	1
S362	Displacement transducer 10 mm	2	S325	Nylon tubing (25 m. coil)	9
S362-12	Pressure transducer 1700 kPa	3	S327	Flaring tool	1
S362-15	De-airing block	1	S353	Null indicator	3
S362-06	Volume change unit	1	S356	Differential manometer	3
S362-01	Displacement transducer 25 mm	1	V300-17	Mercury 1 Kg.	3
S362-32	Digital gauge 25 mm	1	S359	Consolidation frame	1
S361	Data acquisition system	1	S273	Set of 50 Kg of weights	3
S361-01	Expansion module 8-channels	1	S332-05	Set of suggested spares and wearable accessories	1
S362-22	Cable 5 metres long	7			
S364-01	Software triaxial program	1			
S332-04	Set of suggested spares and wearable accessories	1			

COMPOSITION EXAMPLES OF COMPLETE TRIAXIAL EQUIPMENT

TYPE "G"

Triaxial system for **UU, CU** and **CD** tests (3 cells)
for specimens dia. mm 38

SEMI-AUTOMATIC DATA ACQUISITION

Model	Description	Q.ty
S301	Triaxial machine 50 kN cap.	1
S377	Dial gauge, 25 mm. stroke	4
S370-02	Proving ring, 2 kN	1
S370-04	Proving ring, 5 kN	1
S305	Triaxial cell	3
S315	Plinth	3
S314	Top cap	3
S317	Perspex porous disc (2 pcs)	3
S316	Porous disc (2 pcs)	3
S310	Rubber membrane (10 pcs)	4
S319	Filter paper drain (50 pcs)	4
S320	Filter paper (100 pcs)	3
S311	Membrane sealing ring (10 pcs)	3
S318	"O" ring for plinth	1
S312	Membrane stretcher	1
S313	Split former	1
S323	Core cutter	3
S324	Extraction plate	1
S340	Pressure measuring panel	3
S345	Screw pump	2
S350-01	Two-way distribution valve	15
S357	Volume change device	3
S350	Air/water constant pressure system	6
S350-03	Air filter unit	2
S351	Laboratory air compressor	1
S348	Five-way distribution panel	3
S355	De-airing tank	1
V204	Vacuum pump	1
S355-01	Water trap	1
S325	Nylon tubing (25 m. coil)	9
S327	Flaring tool	1
S359	Consolidation frame	1
S373	Set of 50 Kg. of weights	3
S362-01	Displacement transducer 25 mm	3
S362-02	Displacement transducer 50 mm	1
S362	Displacement transducer 10 mm	2
S362-12	Pressure transducer 1700 kPa	9
S362-15	De-airing block	3
S362-22	Cable 5 metres long	15
S361	Data acquisition system	1
S361-01	Expansion module 8-channels	2
S332-06	Set of suggested spares and wearable accessories	1

TYPE "H"

Triaxial system for **UU, CU** and **CID** tests (3 cells)
for specimens dia. mm 38

AUTOMATIC DATA ACQUISITION

Model	Description	Q.ty
S301	Triaxial machine 50 kN cap.	1
S377	Dial gauge, 25 mm. stroke	1
S370-02	Proving ring, 2 kN	1
S370-04	Proving ring, 5 kN	1
S305	Triaxial cell	3
S315	Plith	3
S314	Top cap	3
S317	Perspex porous disc (2 pcs)	3
S316	Porous disk (2 pcs)	3
S310	Rubber membrane (10 pcs)	4
S319	Filter paper drain (50 pcs)	4
S320	Filter paper (100 pcs)	3
S311	Membrane sealing ring (10 pcs)	3
S318	"O" ring for plinth	1
S312	Mebrane stretcher	1
S313	Split former	1
S323	Core cutter	3
S324	Extraction plate	1
S340	Pressure measuring panel	3
S345	Screw pump	2
S350-01	Two-way distribution valve	15
S357	Volume change device	3
S350	Air/water constant pressure system	6
S350-03	Air filter unit	2
S351	Laboratory air compressor	1
S348	Five-way distribution panel	3
S355	De-airing tank	1
V204	Vacuum pump	1
S355-01	Water trap	1
S325	Nylon tubing (25 m. coil)	9
S327	Flaring tool	1
S359	Consolidation frame	1
S273	Set of 50 Kg of weights	3
S362-02	Displacement transducer 50 mm	1
S362	Displacement transducer 10 mm	2
S362-01	Displacement transducer 25 mm	3
S362-12	Pressure transducer 1700 kPa	9
S362-06	Volume chance unit	3
S362-32	Digital gauge 25 mm	3
S361	Data acquisition system	1
S361-01	Expansion module 8-channels	3
S364-01	Software triaxial program	1
S362-15	De-airing block	3
S362-22	Cable 5 metres long	17
S332-07	Set of suggested spares and wearable accessories	1



LOAD PROVING RINGS

Used for load compression measurement applied by the testing machine.

Made from hardened alloy steel, complete with upper and lower coupling blocks having M10 female gas thread.

The accuracy is $\pm 1\%$ of applied load and repeatability is within 0,2%

Each ring is supplied complete with calibration chart made by PC

Large range from 0,5 kN to 400 kN in the following versions:

S370 Serie with dial gauge 0,01 mm graduation

S371 Serie with dial gauge 0,001 mm graduations

S372 Serie with digital gauge 0,001 mm graduation, including battery

section S



246

Max. Capacity kN	Dial gauge 0,01 mm	Dial gauge 0,001 mm	Digital gauge 0,001 mm	Height mm	Weight Kg
0,5	S370	S371	S372	210	1,6
1	S370-01	S371-01	S372-01	210	1,7
2	S370-02	S371-02	S372-02	210	1,8
3	S370-03	S371-03	S372-03	210	1,9
5	S370-04	S371-04	S372-04	210	2
10	S370-05	S371-05	S372-05	210	2,2
15	S370-06	S371-06	S372-06	210	2,5
20	S370-07	S371-07	S372-07	210	3
30	S370-08	S371-08	S372-08	210	3,5
40	S370-09	S371-09	S372-09	210	3,9
50	S370-10	S371-10	S372-10	210	7,2
60	S370-11	S371-11	S372-11	210	7,7
100	S370-12	S371-12	S372-12	210	10,2
250	S370-13	S371-13	S372-13	318	16
400	S370-14	S371-14	S372-14	318	21



ACCESSORIES:

S374

Stem Brake Device, it holds the max. reached value on the dial gauge, with manual zero setting.

S374-01

Stop Safety Device, electrical, to stop the machine when reaching the max. capacity of the ring, to prevent any overload damage.

S374-02

Ball seat, complete with connector, for an articulated coupling to the testing machine.

Dial indicators

Diameter of the dial: 60 mm, with clockwise rotation.

Model	Travel mm	Division mm
S375	5	0,001
S376	10	0,01
S377	25	0,01
S378	30	0,01
S379	50	0,01

Digital dial indicators, including battery

Model	Travel mm	Division mm	RS 232 port
S381	12	0,01	Yes
S382	12,7	0,001	No
S382-01	12,7	0,001	Yes
S383	25	0,001	Yes

Note: RS 232 port is used for PC connection.

ACCESSORIES:

S380

Magnetic dial holder, comprising a fix rod and an adjustable rod.
Magnetic base force 25 Kg

S374

Stem brake device, to hold the max. reached value on the dial gauge, with manual zero setting.

S380-01

Rear mount of the dial indicator.

S390

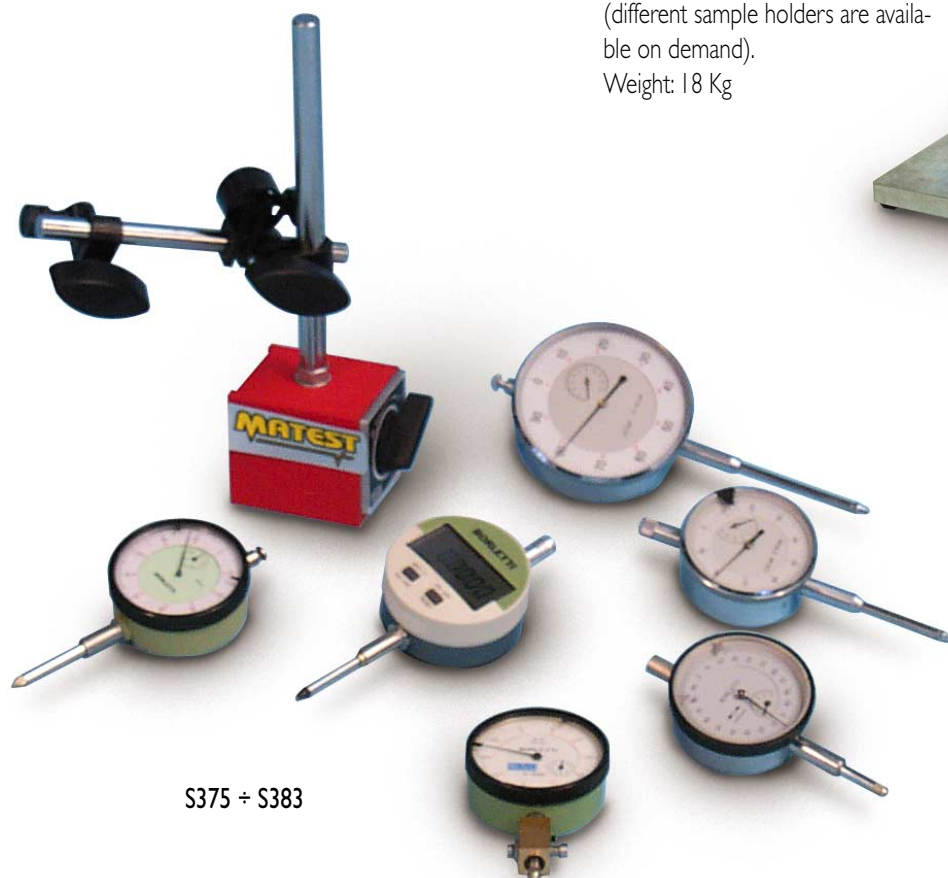
Calibration unit for extensometers and dial gauges

This Appliance can be used to check the displacement calibration of extensometers, dial gauges, transducers etc.

Composed by:
Aluminium frame,
Delicate moving saddle,
Digital micrometric head 50 mm. travel, resolution 0,001 mm, error limit $\pm 0,003$ mm.

Sample holder to fit dial gauges with stem having 8 mm. diameter (different sample holders are available on demand).

Weight: 18 Kg



S375 ÷ S383

S390





Section V

GENERAL EQUIPMENT

This section proposes a wide range of laboratory equipment and accessories that cannot be located in a specific application, but they are utilized for general purposes and are suitable to perform properly different measuring procedures of liquids and solids, weighing, temperature, containers, still, pH, chemicals, reagents etc.



Index section

GENERAL EQUIPMENT

	Mod.	Page		Mod.	Page
Air compressor.....	V206.....	270	Mortar and pestle, stainless.....	VI 12-05.....	267
Anemometer.....	VI 48-01.....	264	Ohaus balances.....	V014/V018.....	250
Bags, plastic.....	VI 45.....	261	Pans, metallic.....	VI 82.....	267
Balances.....	V014/V093.....	250/255	Petri dish.....	VI 23.....	258
Basket, density.....	V041.....	251	PH meters.....	V214.....	271
Beakers.....	VI 04.....	256	Picks.....	VI 97.....	269
Bottles, plastic.....	VI 18.....	261	Pipettes, graduated.....	VI 42.....	259
Boxes, plastic.....	VI 27.....	261	Plastic products.....	VI 02/VI 45.....	261
Bristles.....	VI 79.....	266	Porcelain products.....	VI 12/VI 40.....	260
Brushes.....	VI 78.....	266	Pyknometers.....	VI 03.....	256
Buchner funnel.....	VI 40.....	260	Rain gauges.....	VI 67.....	264
Bunsen burner.....	VI 73.....	266	Reagent bottles.....	VI 08-10.....	257
Burettes, graduated.....	VI 43.....	259	Rubber heated pestle.....	VI 13.....	260
Burner, butane.....	V201-01.....	270	Rules.....	VI 76.....	266
Calipers, vernier.....	VI 75.....	266	Sand bath.....	V241.....	273
Chattaway spatula.....	VI 92-08.....	268	Scoops.....	VI 83.....	268
Chemical products.....	V300.....	273	Shovel.....	VI 96.....	269
Chisel.....	VI 98.....	269	Spatulas.....	VI 92.....	268
Conductivity meter.....	VI 64.....	265	Specific gravity bottles.....	VI 08.....	257
Containers, metallic.....	VI 16.....	267	Specific gravity frame.....	V084.....	253
Crucibles, porcelain and platinum.....	VI 17.....	260	Spoon.....	VI 86.....	269
Cylinders, graduated.....	V098.....	256	Sand bath.....	V241.....	273
Decanters, plastic.....	VI 02.....	261	Stands, metal.....	V219.....	272
Desiccators.....	A035.....	259	Stirrer/heater, magnetic.....	B073-01.....	269
Dropping bottle.....	VI 24.....	258	Stirring rods.....	VI 47.....	259
Drier, warm air.....	V201.....	270	Thermo-hygrograph.....	VI 68.....	264
Erlenmeyer flasks.....	VI 06.....	256	Thermo-hygrometer.....	VI 65.....	265
Evaporating dishes, porcelain.....	VI 14.....	260	Thermometers.....	VI 50.....	262/263
Filter funnel.....	VI 38.....	259	Timing device.....	VI 71.....	265
Filter paper.....	V218.....	271	Tins, metallic.....	VI 22.....	267
Flasks, glassware.....	VI 06/VI 09.....	256/257	Tongs, crucible.....	VI 74.....	266
Funnels, glass.....	VI 19.....	258	Tool kit.....	V222.....	272
Funnels, plastic.....	VI 35/VI 37.....	261	Trolley.....	V224.....	272
Gay Lussac bottles.....	VI 08.....	257	Trowels.....	VI 88.....	269
Glassware.....	V098/VI 47.....	256/259	Tubing, rubber.....	V230.....	272
Gloves.....	VI 77.....	266	Vacuum pumps.....	V203.....	270
Hammers.....	VI 93.....	269	Vibration-free assembly.....	V068.....	253
Hoffman screw clamp.....	V220.....	272	Volumetric flasks.....	VI 09.....	257
Hot plates.....	V200.....	269	Wash bottles.....	VI 20.....	261
Hubbard-Carmick bottles.....	VI 11.....	258	Watch glass.....	VI 15.....	258
Hydrometers.....	VI 72.....	265	Watch, stop.....	VI 70.....	265
Hygrometer, hair.....	VI 69.....	264	Water baths.....	B052.....	273
Impurities test bottles.....	SI 32-01.....	258	Water stills.....	V212.....	271
Ladle.....	VI 86-01.....	269	Weather station.....	VI 48.....	264
Mallets, rubber and steel.....	VI 95.....	269	Weighting bottles.....	VI 10.....	258
Mixing bowls.....	VI 16.....	267	Whatman paper.....	V218.....	271
Mortar and pestle, porcelain.....	VI 12.....	260	Wheelbarrow.....	V226.....	272



MECHANICAL BALANCES, ORIGINAL "OHAUS"

MODELS:

V014

DIAL-O-GRAM Balance 310 g. capacity \times 0,01 g sensitivity, triple beam with vernier. Includes stainless steel pan, zero adjustment. Weight 3 Kg



V016-02

BALANCE, 16 Kg capacity \times 5 g sensitivity. Bearing plate dia. 254 mm. Complete with set of weights. Weight 15 Kg



V015

CENT-O-GRAM Balance 311 g. capacity \times 0,01 g. sensitivity, four beams. Includes stainless steel pan, zero adjustment. Weight 3 Kg

V016

TRIPLE BEAM Balance 2610 capacity \times 0,1 g sensitivity. Includes stainless steel pan, set of weights. Weight 4 Kg



V017

HEAVY DUTY SOLUTION Balance 20 Kg. capacity \times 1 g sensitivity. Complete with set of weights, sliding weight for tare up to 2270 g, holding plate 280 mm diameter. Weight 20 Kg



V018

HARVARD TRIP DUAL PAN Balance 2000 g. capacity \times 0,1 g sensitivity. The plates are stainless steel. Complete with set of weights. Weight 6 Kg



V016-01

TRIPLE BEAM Balance 2610 capacity \times 0,1 g sensitivity, with vernier. Weight 4 Kg





V023-01

Moisture determination balance

160 g. capacity \times 0,001/0,01 g. sensitivity with tare up to 10 g.
Samples are dried by a infrared lamp with adjustable heat control.
A built-in-timer 0-61 min. switches off the heater at the end of the drying cycle which is signaled by a bell. Moisture loss percentage and residual mass are read directly from the lighted scale.

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

V023-01



V023-02

Moisture determination balance

Capacity: 10 g. of material
Dial range 0 -20% and 20 - 40%
Accuracy 0,1%
Direct reading of moisture on a wide dial

Timer 0 - 30 minutes
Power supply:
220-240 V 1ph 50/60 Hz

V023-02



Semi-automatic zero-centering balance

This scale with central zero is particularly suitable for predetermined weights. It has two pans; the sample is placed on the main pan and the weights are placed on the other until the pointer indicates the dial.

Weights are not included and should be ordered separately.

MODELS:

- V031** Capacity 10 Kg. sens. 1 g. Dial -100 +100 g
V034 Capacity 30 Kg. sens. 5 g. Dial -250 +250 g



V031

WEIGHTS FOR BALANCES:

V036

SET OF BRASS WEIGHTS comprised in a wooden box.
Total weight reaching 1000 g. The set is formed by: 1x500 g, 1x200 g, 2x100 g, 1x50 g, 1x20 g, 2x10 g, 1x5 g, 2x2 g, 1x1 g

V036-02 Weight 0,5 Kg, cast iron, calibrated

V037 Weight 1 Kg, cast iron, calibrated

V038 Weight 2 Kg, cast iron, calibrated

V039 Weight 5 Kg, cast iron, calibrated

V040 Weight 10 Kg, cast iron, calibrated

V040-01 Weight 20 Kg, cast iron, calibrated

V036-02 ÷ V040-01



V036

V041

DENSITY BASKET

STANDARDS: ASTM C127 - AASHTO T85

Used for specific gravity tests, stainless steel made, dia. 200x200 mm, mesh size 3,35 mm

Weight 1,5 Kg



V041

B017-01

B017-01

Density Basket, stainless steel made, dia. 150x135 mm, mesh size 0,074 mm. Weight 500 g

B017-02

Density Basket, stainless steel made, dia. 150x135 mm, mesh size 0,400 mm. Weight 600 g

B017-04

Density Basket, stainless steel made, dia. 150x135 mm, dual mesh size 0,074 and 0,400 mm. Weight 700 g

V042

Density tank, dimensions 370x370x330 mm
Weight: 3 Kg

ROTARY AUTOMATIC SCALES

Five pointer turns allow a larger amplitude of the subdivision.
Double quadrant and under quadrant sacking for multiples.
Oil oscillation shock-absorber, with exterior adjustment.
Displacement of the head in all positions without angulation limit.
Pan, mass-produced, stainless steel.

Models	Capacity	Sensitivity
V044	5 Kg	2 g
V046	20 Kg	5 g
V047	30 Kg	10 g
V057	60 Kg	20 g
V059	150 Kg	50 g
V060	300 Kg	100 g



V047



V057

BATCHING SCALE

Completely produced in painted metal, double oscillation, case in strong profiled, platform in reinforced steel. The sliding weight and accessories are brass made while the rod is from chromed steel.
Supplied complete with set of weights.

Models	Capacity	Sensitivity
V050	100 Kg	100 g
V052	300 Kg	100 g
V053	500 Kg	100 g



V050

SEMI-AUTOMATIC SPECIFIC GRAVITY BALANCES

Used both for general laboratory purposes and for specific gravity determination of liquids and solids. Supplied complete with plexi-glass tank, wire basket, set of weights and standard pan for normal weighting operations.

Model	Capacity	Sens.	Scale range	Volumes up to
V091	2 Kg	0,2 g	20 g	1000 ml
V092	5 Kg	0,2 g	20 g	1000 ml
V093	10 Kg	0,5 g	100 g	4000 ml



V092



V064

Analytical balance

Single pan, optical reading. Capacity 200 g. and sensitivity 0,1 mg. Ideal for very accurate weightings and for heat of hydration cement tests. Weightings by subtraction. Pre-weighting device to avoid damages to knives.

Outer handling of all weights up to 199,9 g. Stainless steel pan, 100 mm. dia., hangers height 167 mm. Wide screen up to 100 mg. Direct optical reading of the 2nd and 3rd decimal figure and vernier for the 4th. Levelling feet and air bubble. Dust-proof plastic cover.

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

Dimensions: 310x400x450 mm

Weight: 11 Kg



V064

V068

V068

Vibration-free assembly

Wholly plastic coated table 90x70x80 cm, with sand and rubber dampers totally independent from the inner damping frame. Marble support for the instrument 38x44 cm. and small drawer. Inner iron rack consisting of four hollow legs filled up with thin sand and rubber; to absorb all kinds of vibration. This unit is specially needed by analytical and high precision balances, so as to grant steady support and to avoid external vibrations.

V084

Specific gravity frame (Bouyancy balance system)

STANDARDS: BS 812:2 - 1881:114 - EN 12390:7 - UNI 6394

Used for specific gravity determination of concrete, aggregates etc. It must be utilized with a suitable electronic balance fitted with an under - hook facility (see table at pag. 255).

Robust steel frame made, it incorporates on its lower part a platform adjustable in height, holding a water container; and allowing the specific gravity test. Complete with cradle for holding concrete cube and cylinder specimens. The balance is not included and must be ordered separately.

Dimensions: 510x510x1150 mm Weight: 50 Kg

V065

Analytical balance

Single pan, digital reading. Capacity 210 g. and sensitivity 0,1 mg. Ideal for very accurate weightings and for heat of hydration cement tests. Weighting by subtraction. Pre-weighting device. Outer handling of all weights up to 199,9 g. Direct reading on a wide 7- segment led display up to the 4th decimal figure. Reading hold up for any interval of time. BCD output for the printer (accessory).

Dust-proof plastic cover. Levelling feet and air bubble.

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

Weight: 13 Kg

V065-01

ANALYTICAL BALANCE, identical to mod. V65 but having capacity 120 g and sens. 0,1 mg. Supplied complete.



V065



V072-02

V084

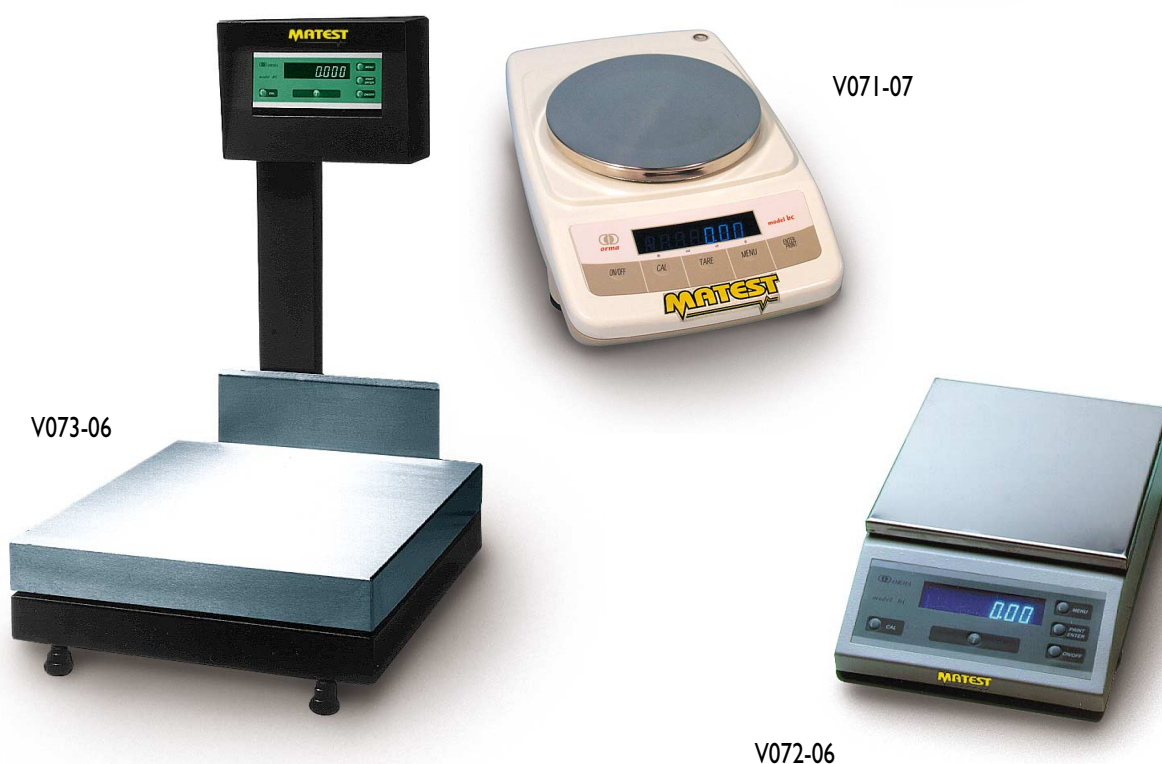


ELECTRONIC PRECISION TOP LOADING AND PLATFORM BALANCES

Immediate zeroing and tare, automatic stabilization, automatic changeover of scale sensitivity (dual range models only).

Power supply (electric models): 220-240V 1ph 50/60 Hz

section V





Model	Capacity	Sensitivity	Pan dimensions mm	Note:	Accessories
V070-01	150 g	0,005 g	124x144	C + G	
V070-02	160 g	0,001 g	Ø 110	A + F	G + H
V070-03	300 g	0,01 g	Ø 110	C + G	
V070-04	300 g	0,1 g	132x160	C	
V070-05	330 g	0,001 g	Ø 110	A + F	G + H
V070-06	500 g	0,001 g	Ø 110	A + F	G + H
V070-07	600 g	0,02 g	Ø 110	C + G	
V070-08	600 g	0,2 g	132 x 160	C	
V070-09	800 g	0,01 g	Ø 160	A + F	G + H
V071-01	1000 g	1 g	180x180	B	
V071-02	1500 g	0,05 g	140x170	C + G	
V071-03	1500 g	0,5 g	132x160	C	
V071-04	1700 g	0,01 g	Ø 160	A + F	G + H
V071-05	3000 g	0,1 g	140x170	C + G	
V071-06	3000 g	1 g	232x232	C	
V071-07	3500 g	0,01 g	Ø 160	A + F	G + H
V071-08	4500 g	0,1 g	Ø 160	A + F	G + H
V071-09	5000 g	1 g	150x160	A	
V072-01	5000 g	5 g	180x180	B	
V072-02	800/5500 g	0,01/0,1 g	Ø 160	A + F	G + H
V072-03	7500 g	0,1 g	340x210	A	
V072-04	1000/10000 g	0,1/1 g	190x210	A + F	G + H
V072-05	10 Kg	0,5 g	250x210	D + G	
V072-06	12 Kg	0,1 g	320x210	A + F	G + H
V072-07	15 Kg	0,5 g	210x210	D	
V072-08	15 Kg	5 g	232x232	C + G	
V072-09	4500/16000 g	0,1/1 g	320x210	A + F	G + H
V073-01	16 Kg	0,1 g	320x210	A + F	G + H
V073-02	20 Kg	1 g	250x210	D + G	
V073-03	30 Kg	0,5 g	450x500	A	G + H
V073-04	4500/30000 g	0,1/1 g	320x210	A + F	G + H
V073-05	30 Kg	10 g	290x246	E	
V073-06	60 Kg	1 g	450x500	A	G + H
V073-07	60 Kg	20 g	360x450	C	
V073-08	60 Kg	5 g	430x530	E + G	
V074-01	100 Kg	10 g	430x530	E + G	
V074-02	200 Kg	20 g	430x530	E + G	
V074-03	300 Kg	50 g	430x530	E + G	

NOTE: Standard equipment

A = Power supply only 220-240V 1ph 50/60 Hz

B = Power supply only alkaline batteries

C = Power supply alkaline batteries
+ 220-240V 1ph 50/60 Hz

D = Power supply: only rechargeable batteries

E = Power supply: rechargeable batteries
+ 220-240V 1ph 50/60 Hz

F = Under balance weighting facility for specific gravity tests

G = RS 232 port

ACCESSORIES:

G = V074-11

H = V074-12

RS 232 port with connection cable

Printer complete with connection cable

LABORATORY GLASSWARE

Measuring cylinders, available in the following models:

Capacità	transparent plastic spouted	glass with stopper	opaque plastic spouted	transparent glass spouted
10 ml.	V098	V099	V100	V101
25 ml.	V098-01	V099-01	V100-01	V101-01
50 ml.	V098-02	V099-02	V100-02	V101-02
100 ml.	V098-03	V099-03	V100-03	V101-03
250 ml.	V098-04	V099-04	V100-04	V101-04
500 ml.	V098-05	V099-05	V100-05	V101-05
1000 ml.	V098-06	V099-06	V100-06	V101-06
2000 ml.	V098-07	V099-07	V100-07	V101-07



Pyknometers, pyrex glass, with ground-in-perforated stopper

Capacity	Mouth dia. 29/32 mm	Mouth dia. 40/45 mm
250 ml	V105-03	=
500 ml	V105	V105-04
1000 ml	V105-01	V105-05
2000 ml	V105-02	V105-06



Beakers, pyrex glass with spout. Squat form.

Model	Capacity
V104	25 ml.
V104-01	50 ml.
V104-02	100 ml.
V104-03	250 ml.
V104-04	600 ml.
V104-05	1000 ml.
V104-06	2000 ml.
V104-07	5000 ml.



Pyknometers, borosilicate glass.

Complete with capillary tube, stopper and funnel, used to determine the voids and bulk density of aggregates

Model	Capacity
V103	500 ml
V103-01	1000 ml

Conical flasks, Erlenmeyer, pyrex glass wide mouth

Model	Capacity
V106	100 ml.
V106-01	250 ml.
V106-02	500 ml.
V106-03	1000 ml.
V106-04	2000 ml.





257



V107...

V106...

V103

V109-04...

V109...

Filter flasks, pyrex glass, for Vacuum filtering

Model	Capacity
V107	250 ml.
V107-01	500 ml.
V107-02	1000 ml.
V107-03	2000 ml.
V107-04	Perforated stopper with glass tube for the filter flask

Specific gravity Gay-Lussac bottles

Model	Capacity
V108	25 ml.
V108-01	50 ml.
V108-02	100 ml.



V108...

Volumetric flask, stoppered, borosilicate glass

STANDARDS: BS-ISO 1042 - ASTM D854

Model	Capacity
V109	100 ml.
V109-01	250 ml.
V109-02	500 ml.
V109-03	1000 ml.

Reagent bottles

Model	Capacity
V108-10	250 ml
V108-11	500 ml
V108-12	1000 ml



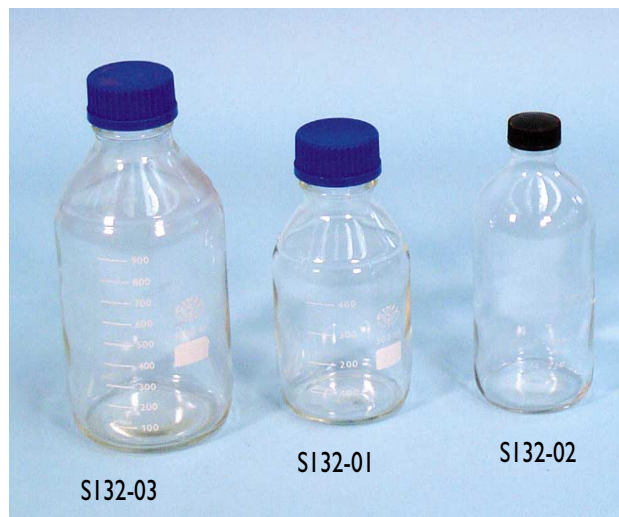
V108-10...

Volumetric flask, unstoppered, borosilicate glass

Model	Capacity
V109-04	100 ml.
V109-05	250 ml.
V109-06	500 ml.
V109-07	1000 ml.

Graduated impurities test bottles, stoppered, pyrex glass

Model	Capacity	Standard
SI32-01	500 ml	ASTM C40
SI32-02	500 ml	UNI 8020-14
SI32-03	1000 ml	ASTM C40



section V



258

Weighting bottles, glass, with cover

Model	Dimensions
VI10	dia. 50 x h. 30 mm
VI10-01	dia. 25 x h. 40 mm
VI10-02	dia. 70 x h. 50 mm
VI10-03	dia. 40 x h. 60 mm

Glass funnels

Model	Diameter
VI19	25 mm
VI19-01	50 mm
VI19-02	100 mm
VI19-03	150 mm

Hubbard-Carmick specific gravity bottle STANDARD: ASTM D70

Model	Capacity
VIII	24 ml.
VIII-01	25 ml.



Watch glass (beaker cover)

Model	Diameter
VI15	100 mm
VI15-01	130 mm

VI23
Petri dish, with cover, dia. 100 mm, pyrex glass

VI24 **Dropping bottle**, 100 ml capacity



Graduated pipettes, MOHR type, soda glass

Model	Capacity	Sub-divisions
VI42	1 ml	0,01 ml
VI42-01	5 ml	0,1 ml
VI42-02	10 ml	0,1 ml
VI42-03	25 ml	0,1 ml
VI42-04	50 ml	0,1 ml
VI42-05	100 ml	0,2 ml

Graduated burettes, soda glass with stopcock

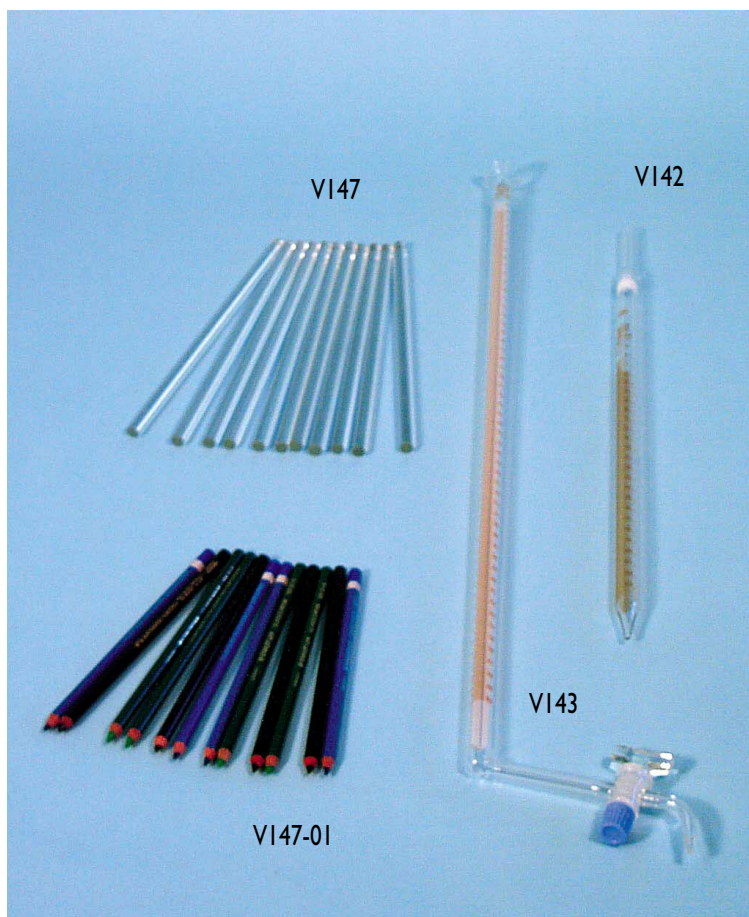
Model	Capacity	Sub-divisions
VI43	25 ml	0,1 ml
VI43-01	50 ml	0,1 ml
VI43-02	100 ml	0,2 ml

VI47

Stirring rod, glass, 8 mm dia. x 250 mm long.
Pack of 10

VI47-01

Marking pencil, glass, pack of 12



Desiccators

Complete with perforated plate

Model	Diameter
A035	200 mm
A036	250 mm
A036-01	300 mm

Vacuum type desiccators

Complete with perforated plate

Model	Diameter
A039	200 mm
A040	250 mm
A040-01	300 mm



VI38

Filter funnel, pyrex glass, dia. 90 mm. for particle analysis
tests to BS 1377

PORCELAIN PRODUCTS

Mortar and Pestle, porcelain

Model	Diameter	Height
VII2	100 mm	60 mm
VII2-01	125 mm	65 mm
VII2-02	150 mm	76 mm
VII2-03	180 mm	92 mm
VII2-04	200 mm	100 mm



VII3
Rubber heated pestle

Evaporating dishes, porcelain, with sput

Model	Diameter
VII4	60 mm
VII4-01	80 mm
VII4-02	100 mm
VII4-03	120 mm
VII4-04	160 mm
VII4-05	210 mm
VII4-06	245 mm
VII4-07	300 mm

- VII7** Porcelain Crucible, 30 ml. squat form
- VII7-01** Porcelain Lid for VII7
- VII7-02** Porcelain Crucible, 50 ml. squat form
- VII7-03** Porcelain Lid for VII7-02
- VII7-04** Platinum crucible 25 ml

VI40
Buchner funnel, porcelain, 115 mm. diameter for use with 110 mm. dia. filter paper:



PLASTIC PRODUCTS



Decanters, polypropylene made

Model	Capacity
VI02	250 ml.
VI02-01	500 ml.
VI02-02	1000 ml.
VI02-03	2000 ml.
VI02-04	3000 ml.

Wash bottles, plastic

Model	Capacity
VI20	100 ml.
VI20-01	250 ml.
VI20-02	500 ml.
VI20-03	1000 ml.

Funnels, plastic

Model	Diameter
VI35	100 ml.
VI35-01	140 ml.
VI35-02	210 ml.

Funnels, wide mouth, plastic

Model	Diameter	
VI36	max. 80 mm	min. 15 mm
VI36-01	max. 120 mm	min. 30 mm
VI36-02	max. 150 mm	min. 35 mm

Funnels, long stem, plastic

Model	Diameter
VI37	60 mm
VI37-01	80 mm
VI37-02	100 mm

Bottles, plastic, stoppered

Model	Capacity
VI18	250 ml.
VI18-01	500 ml.
VI18-02	1000 ml.
VI18-03	2000 ml.
VI21	5 litres
VI21-01	10 litres



Buckets, plastic, with handle

Model	Capacity
VI28	9 litres
VI28-01	12 litres
VI28-02	17 litres



Boxes

plastic, stacking

Model	Dimensions	Capacity
VI27	380x280x200 mm	20 litres
VI27-01	580x330x250 mm	46 litres
VI27-02	660x400x200 mm	72 litres



Sample bags, heavy plastic

Model	Dimensions
VI45	25x35 cm
VI45-01	40x60 cm





DIGITAL THERMOMETERS, complete with depth stainless steel probe, for temperature measurements of liquid, fluid, semisolid, granular materials, air. The probe is directly connected to the digital unit.

Model	Temp. range °C	Resolution °C	Accuracy °C	Probe dimensions dia. x length
VI50	-50 +150	0,1	± 0,3	3x105 mm
VI51	-50 +220	0,1	± 0,3	5x125 mm
VI52	-40 +550	1	± 2	3x130 mm



VI53

Digital thermometer, including remote probe connected to the instrument with a cable 1 metre long.

Temperature range: -50 +150 °C

Resolution: 0,1 °C. Accuracy: ± 0,3 °C

Stainless steel probe dia. 3x160 mm



VI54

Digital microprocessor thermometer

Rugged, easy to use portable instrument with K type sensor for high temperature measurements, it is equipped with a membrane keyboard and microprocessor with memory functions of: hold, min/max temperatures measured in the cycle, °C/F readings.

Dual temperature range: -50 a +150 °C risoluz. 0,1 °C

-50 a +950 °C risoluz. 1 °C

Accuracy: ± 0,5% full scale

Power supply: 1x9V battery with 500 hours use

Supplied **"without"** probe to be selected and ordered separately.

ACCESSORIES:

Stainless steel probe, K type thermocouple, complete with 1 metre cable and connector

VI54-01 Penetration probe dia. 3x120 mm.

Max temperature: 900 °C

VI54-02 Surface probe, dia. 16x260 mm.

Max temperature: 650 °

VI54-03 Air probe, dia. 3x245 mm. Max temperature: 300 °C

VI54-04 General purpose probe, dia. 5x220 mm.

Max temperature: 900 °C



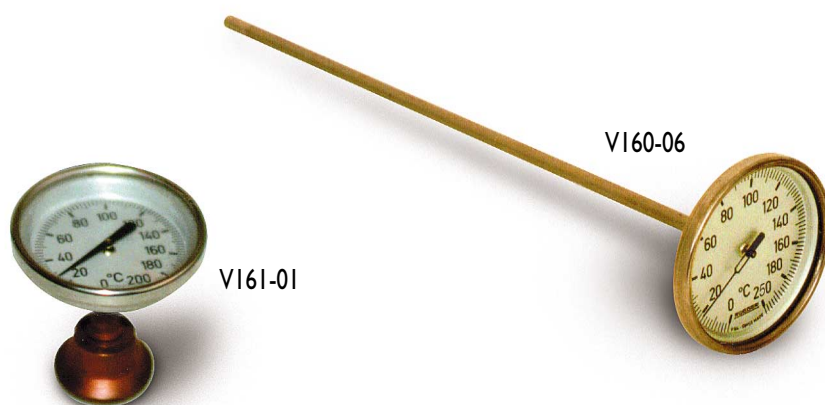
VI54

VI54-01...

DIAL THERMOMETERS, for general purpose use, and temperature measurement of freshly mixed concrete, bituminous mixtures. Stainless steel made.



Model	Range	Sub-divisions	Dial dia.	Stem lenght
VI60	-40 +40 °C	1 °C	50 mm	250
VI60-01	0 +60 °C	1 °C	50 mm	250
VI60-02	0 +100 °C	2 °C	50 mm	250
VI60-03	0 +250 °C	5 °C	50 mm	250
VI60-04	0 +400 °C	10 °C	50 mm	250
VI60-05	0 +60 °C	1 °C	75 mm	600
VI60-06	0 +250 °C	5 °C	75 mm	600
VI61	-30 +70 °C surface measurements			
VI61-01	0 +200 °C surface measurements			



ARMOURED THERMOMETERS

Model	Range	Sub-divisions
VI62	0 ÷ 100 °C	1 °C
VI62-01	0 ÷ 200 °C	2 °C



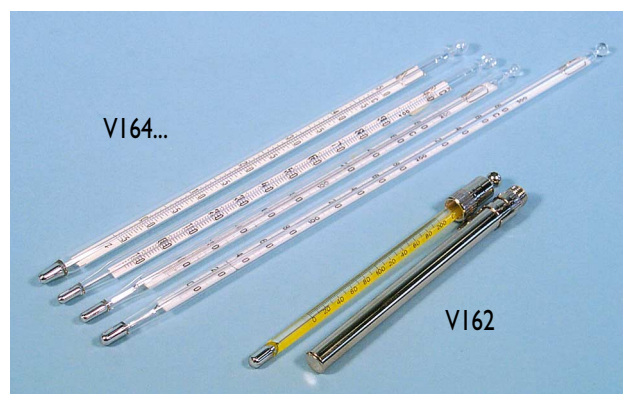
VI63

Max./Min. Thermometer, range -30°C +50 °C

THERMOMETERS,

glass stem and mercury system, for general laboratory use.

Model	Range	Sub-divisions
VI64	-10 +50 °C	0,5 °C
VI64-01	-10 + 100 °C	1 °C
VI64-02	-10 + 200 °C	1 °C
VI64-03	-10 + 300 °C	1 °C



VI48

Weather station for external use.

Comprising: aneroid barometer; min/max thermometer; hair hygrometer.

Dimensions: 260x180 mm

VI48-01

Anemometer

for wind speed and temperature measurements.

Ranges: 6 to 50 knot and -5 +50 °C

VI67

Rain gauge.

for measuring rain fall. Simple model in plastic material

VI67-01

Rain gauge, for measuring rain fall; professional model, brass made. Capacity 250 cc corresponding to 25 ml of rain with 0,1 mm resolution.

VI68

Thermohygrograph, for external use

Simultaneous recording of temperature and humidity on the same chart.

Temperature range: -35 °C +45 °C

Humidity range: 0 - 100%

Time scale: 24 hours or 7 days.

Spring operated. Supplied complete

Weight: 6 Kg

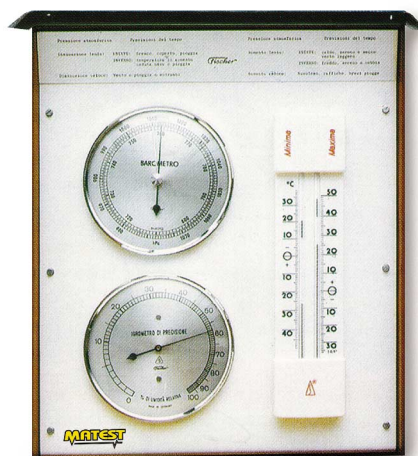


VI68

VI68-01

Thermohygrograph, internal use, same to mod.VI68 but with temperature range 0 +40 °C.

Battery operated



VI48



VI48-01



VI67



VI67-01

SPARE PARTS:

VI68-02 Diagrams for thermohygrograph mod.VI68.

Pack of 55

VI68-03 Diagrams for thermohygrograph mod.VI68-01.

Pack of 55

VI68-04 Writing pen for thermohygrograph.

Pack of 4

VI69 Hair hygrometer, range 0 to 100%



VI69



V170

Stop watch, digital, non magnetic, having also watch functions.
Precision 0,1 second.

V170-01

Stop watch, mechanical dial type, non magnetic.
Precision 0,1 second.

V171

Timing device, 0 to 60 minutes, with alarm.



V166

Conductivity meter, digital, portable, multirange
Used for site and laboratory measurements of the conductivity in soils, through a potentiometric probe at 4 ranges.

Measuring scale: 0,0 to 199,9 $\mu\text{S}/\text{cm}$ - resolution 0,01/0,1 $\mu\text{S}/\text{cm}$ - accuracy 1% FS

Temperature compensation: 0-50 $^{\circ}\text{C}$ automatic

Use conditions: 0 to 50 $^{\circ}\text{C}$ - R.H. 95%

Battery: 1x9V

Dimensions: 185x82x45 mm

Weight: 400 g



V166

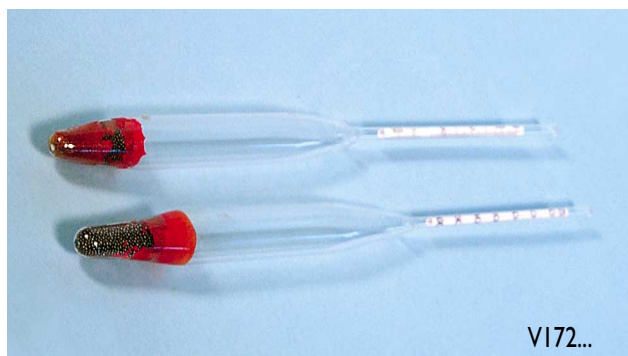
Soil hydrometers

V172 Range 0,995 - 1,038 g/ml, div. 0,001 - 151 H

V172-02 Range -5 + 60 g/litre - 152 H

V172-03 Range 0,995 - 1,030 g/ml - BS 1377 - long stem

V172-04 Range 1,000 to 1,200 g/ml for additives



V172...

V165

Thermo-hygrometer, digital, portable, with detachable probe, it measures and displays in a short time both relative humidity and temperature.

Scala: R.H. 10,0 to 95,0% - resolution 0,1% - accuracy $\pm 2\%$
 $^{\circ}\text{C}$ 0,0 to 60,0 - resolution 0,1 $^{\circ}\text{C}$ - accuracy $\pm 0,4$ $^{\circ}\text{C}$

Battery: 1x9V

Dimensions: 185x82x45 mm

Weight: 400 g



V165

General equipment

section V

V173 BUNSEN BURNER, with air control, complete with tripod and iron wire gauze with ceramic centre

V173-01 Bunsen burner only, with air control

V173-02 Tripod only

V173-03 Iron wire gauze with ceramic centre

V174 CRUCIBLE TONGS

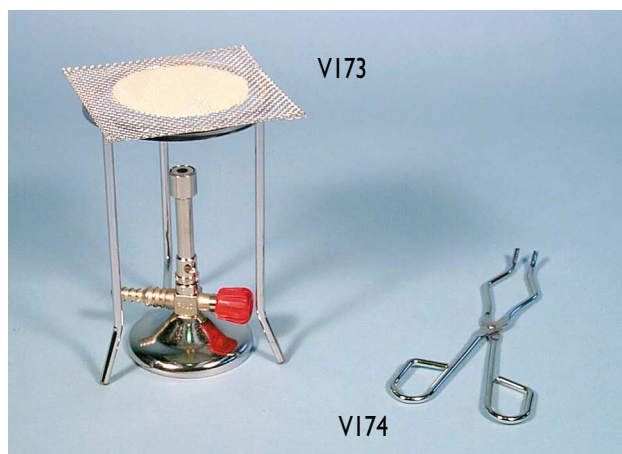
V175 VERNIER CALIPER, 0-160 mm x 0,02 mm

V175-01 VERNIER CALIPER, 0-205 mm x 0,02 mm

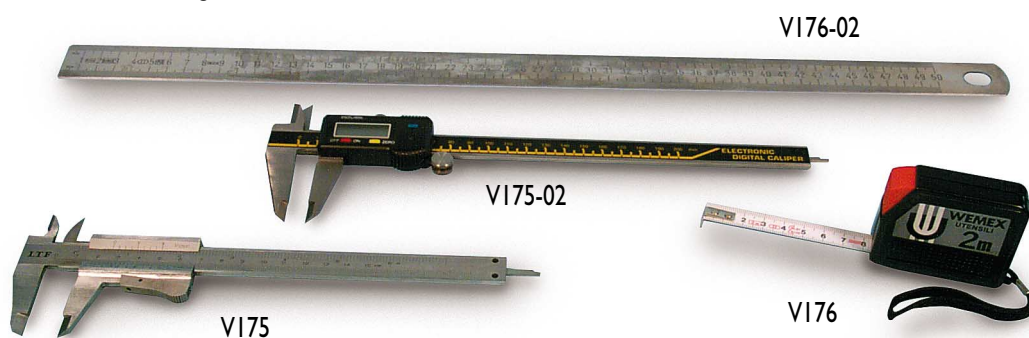
V175-02 DIGITAL VERNIER CALIPER, 0-200 mm x 0,01 mm. Readings in mm and inch.

V176 STEEL FOLDING RULE, 2 metres long

V176-02 STEEL RULE, 500 long, metric and inch.



266



V177 HEAT RESISTANT GLOVES

V177-01 NEOPRENE GLOVES



V178 SOFT BRUSH, for cleaning sieves etc.

V178-01 FINE WIRE BRUSH

V178-03 BOTTLE BRUSH dia. 50 mm

V179 BRISTLE, round, 35 mm. dia. soft hair

V179-01 BRISTLE, flat 62 mm. soft hair

V179-02 SIEVE BRUSH, double-ended, brass/nylon

V179-03 SIEVE BRUSH, double-ended, soft/hard nylon

V179-04 SIEVE BRUSH, fine brass

V178 ÷ V179-04



METAL CONTAINERS AND PRODUCTS:

Mixing bowls, stainless steel

Model	Diameter
V116	240 mm
V116-01	300 mm
V116-02	350 mm

V112-05

Mortar and Pestle, stainless steel, dia. 135 mm..

Tins, with or without cover

- V122** Dia. 55 x 35 mm aluminium, with cover
V122-01 Dia. 55 x 65 mm aluminium, with cover
V122-02 Dia. 75 x 50 mm aluminium, with cover
V122-03 Dia. 57 x 32 mm aluminium, without cover
V122-04 Dia. 45 x 13 mm aluminium, without cover
V122-05 Dia. 55 x 35 mm brass, without cover
V122-06 Dia. 70 x 45 mm brass, without cover
V122-07 Dia. 90 x 20 mm di aluminium, with cover

V182...



SAMPLE CONTAINERS, tinned steel, airtight lid

Model	Capacity
V125	0,5 litre
V125-01	1 litre
V125-02	3 litres
V125-03	5 litres
V125-04	10 litres

V125...



PANS: ALUMINIUM, GALVANIZED AND STAINLESS STEEL MADE

Model	Dimensions mm	Material
V182	600x600x80	galvanized steel
V182-03	500x400x120	galvanized steel
V182-04	250x120x80	galvanized steel
V182-06	306x306x38	galvanized steel
V182-07	460x460x50	galvanized steel
V182-08	910x910x76	galvanized steel
V182-01	370x260x50	alluminium
V182-02	330x220x50	alluminium
V182-05	270x180x50	alluminium
V182-10	250x180x47	stainless steel
V182-11	300x220x50	stainless steel
V182-12	350x250x57	stainless steel
V182-13	400x280x60	stainless steel

V182-10...



V182-01...

ROUND ALUMINIUM SCOOPS

Model	Dimensions mm	Capacity ml
VI83	245x80	325
VI84	260x90	500
VI84-01	335x120	1000
VI84-02	380x145	1550
VI84-03	420x160	2600

FLAT ALUMINIUM SCOOPS

Model	Dimensions mm	Capacity ml
VI84-04	210x70	165
VI84-05	310x110	450
VI84-06	350x135	755
VI84-07	400x155	1550

ROUND STAINLESS STEEL SCOOPS

Model	Dimensions mm	Capacity ml
VI85	100x185	500 ml
VI85-01	120x200	1000 ml
VI85-02	150x270	2000 ml

VI85-03 125x250 5 Kg of concrete
STANDARDS: EN 12350/1 - UNI 9416
BS 1881:101

FLEXIBLE SPATULAS

stainless steel

Model	Blade length mm
VI92	100
VI92-01	150
VI92-02	200
VI92-03	300

RIGID SPATULAS, stainless steel

Model	Blade width mm
VI92-04	20
VI92-05	50
VI92-06	70
VI92-07	100

VI92-08 CHATTAWAY SPATULA



VI83 ÷ VI84-03



VI84-04...



VI85 ÷ VI85-02

VI85-03



VI92 ÷ VI92-07

VI92-08



V186 SAMPLING SPOON, large sized

V186-01 LADLE, stainless steel

V187 RECTANGULAR TROWEL 120x260 mm
stainless steel

V188 TROWEL 100x200 mm - stainless steel

V189 TROWEL 60x140 mm - stainless steel

V193 STEEL HAMMER, 300 g

V194 STEEL MALLET, 1000 g

V195 RUBBER MALLET, head dia. 55 mm

V196 SHOVEL, with handle

V197 PICK MATTOCK, with handle

V198 DENSITY CHISEL, 300 mm
long x 25 mm wide

V199 DENSITY PICK, small sized



Hot plates, complete with thermoregulator
Power supply: 220-240 V 1 ph 50/60 Hz

MODELS:

V200 Round dia. 185 mm - 1200 W

B073 Round dia. 160 mm - 1000 W

B074 Round dia. 160 mm - 1000 W

V200-01 Rectangular 200x300 mm - 1500 W

V200-03 Rectangular 300x400 mm - 2400 W

V200-05 Rectangular 400x500 mm - 3400 W

V200-06 Rectangular 400x600 mm - 4000 W



V200



V200-03



B073



B073-01

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: 220-240 V 1 ph 50 Hz 400 W





V201

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

Power supply: 220-240V 1 ph 50 Hz 1200 W



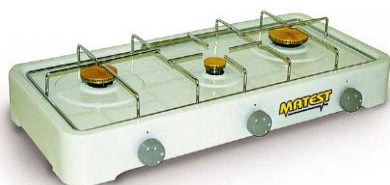
V201

V201-01

Butane three-burner field heater; to be used with a common butane cylinder

Dimensions: 600x320x90 mm

Weight: 5 Kg



V201-01

V202

Aspirator pump, used with current water having approx. pressure of 0,7 Kg/cm² to create a moderate vacuum.



V202

S351

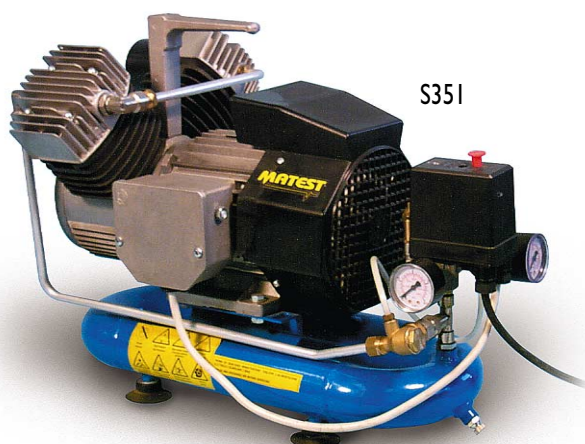
Air compressor

Max pressure: 17 bar

Power supply: 220-240V 1 ph 50 Hz

Dimensions: 520x310x400 mm

Weight: 35 Kg



S351

V203

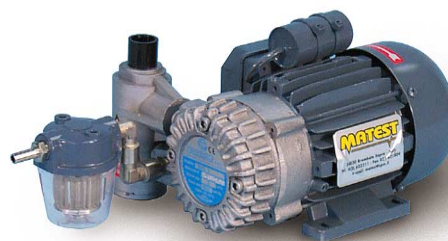
Vacuum pump portable, one stage type, it produces an ultimate vacuum of 650 mm. Hg.

Volume sucked: 2 Cu.m/h

Power supply: 220-240V 1 ph 50 Hz

Dimensions: 180x180x220 mm

Weight: 5 Kg



V203

V204

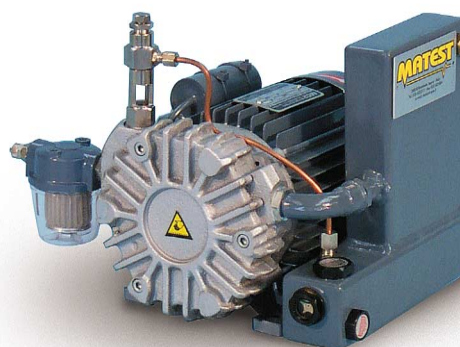
Vacuum pump portable, volume sucked: 5 Cu.m/h

Ultimate vacuum 730 mm/Hg

Power supply: 220-240V 1 ph 50 Hz

Dimensions: 220x260x190 mm

Weight: 12 Kg



V204

V206

Air compressor

Receiver capacity is 24 litres and it delivers 70 litres of air per minute at 6 ATM.

Max pressure is 8 Kg/sq.cm.

Power supply: 220-240V 1 ph 50 Hz

Weight: 30 Kg



V206

V212

Water still 5 litre/hour

Used to produce distilled water, it is equipped of an automatic device to keep the water at a constant level. All stainless steel made it can be easily dismantled for cleaning and maintenance.

Power supply: 220-240V 1ph 50/60 Hz 4000 W

Dimensions: 550x300x650 mm

Weight: 16 Kg



V212

V214

Digital pH meter and thermometer

Accurate, compact model, in plastic carrying case, designed for fast but precise operations also on field conditions.

Measuring range: 0 - 14 pH with resolution of 0,01 pH

Temperature range: -50 +150 °C subdiv. 0,1 °C

Temperature compensation: 0 to 100 °C

Feeding: common 9V battery

Supplied complete with combination electrode, temperature probe, buffer solution powders pH 4 and 7, plastic beakers, accessories.

Weight: 3 Kg



V214

V213

Water still 10 litre/hour

Basically similar to mod.V212.

Power supply: 220-240V 1ph 50/60 Hz 8000 W

Dimensions: 600x360x750 mm

Weight: 20 Kg

V216

pH meter, Digital, Portable

Measuring range: 0 - 14 pH with resolution 0,01 pH

Supplied complete with electrode, buffer solutions pH 4 and 7

Battery fed, included.

Weight: 1 Kg. approx.



V216

Filter paper, pack of 100 pieces

Model	Whatman n°
V218-01	1 x 110 mm dia.
V218-02	1 x 150 mm dia.
V218-03	2 x 110 mm dia.
V218-04	5 x 150 mm dia.
V218-05	40 x 150 mm dia.
V218-06	44 x 150 mm dia.
V218-07	44 x 110 mm dia.
V218-08	50 x 110 mm dia.
V218-09	54 x 150 mm dia.
V218-10	540 x 150 mm dia.
V218-11	541 x 110 mm dia.

V218...



271



Metal stands, with rod

- V219** Metal stand, base 165x140. Rod dia. 10x500 mm. Weight: 3 Kg
- V219-01** Metal stand, base 200x260. Rod dia. 12x800 mm. Weight: 5 Kg
- V220** Hoffman screw clamp, max opening 25 mm
- V220-01** Mohr clamp
- V220-02** Double sleeve metal/metal. Dia. 10÷25 mm
- V220-03** Double sleeve metal/metal. Dia. 10÷20 mm
- V220-04** Simple clamp. Dia. 10÷20 mm
- V220-05** Simple clamp. Dia. 20÷30 mm



V222

Tool kit, for general purpose uses and normal maintenance of laboratory equipment.
Weight: 10 Kg



Laboratory trolley, used for laboratory displacement of heavy pieces like moulds, soil and concrete samples etc.
Steel made, mounted on rubber wheels.

- V224** Trolley platform size 600x400 mm. Weight: 20 Kg
- V224-01** Trolley platform size 1000x600 mm. Weight: 50 Kg
- V225** Trolley at double shelf size 800x450 mm. Weight: 20 Kg



V226

Wheelbarrow, pneumatic type 0,5 m3 capacity



Rubber tubing

Model	Inside dia.	Length
V230	5 mm	5 metres
V230-01	6,5 mm	5 metres
V230-02	8 mm	5 metres



V241

Sand bath, for the homogeneous heating or evaporation of the content of beakers flasks et.

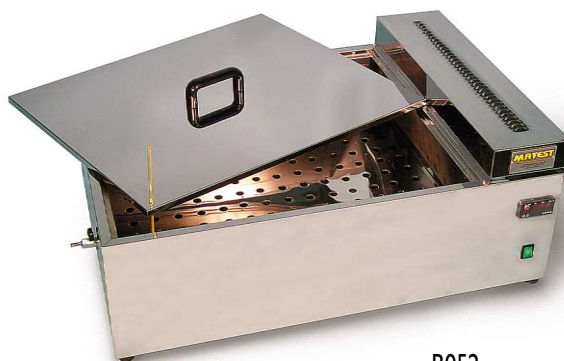
Inside dimensions: 300x240x90 mm Volume: 7 litres

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

Weight Kg. 17



V241



B052

Thermostatic water baths

See Sections: Asphalt/Bitumen, pag. 47

Cement/Mortars, pag. 162

Soils, pag. 200

CHEMICALS

Model	Description	Q.ty
V300-01	Hydrochloric acid	1000 ml
V300-02	Hydrofluoric acid	1000 ml
V300-03	Nitric acid	1000 ml
V300-04	Sulfuric acid	1000 ml
V300-05	Distilled water	1000 ml
V300-06	Hydrogen peroxide	1000 ml
V300-07	Ferric alum, indicator solution	1000 g
V300-08	Ammonia	1000 ml
V300-09	Ammonium carbonate	1000 g
V300-10	Ammonium chloride	1000 g
V300-11	Anhydride phosphoric	500 g
V300-12	Silver nitrate 10 N	1000 ml
V300-13	Barium chloride	1000 g
V300-14	Calcium chloride	1000 g
V300-15	Silica gel	1000 g

Model	Description	Q.ty
V300-16	Glycerine	1000 ml
V300-17	Mercury (pure)	1000 g
V300-18	Vaseline oil	1000 ml
V300-19	Paraffin wax	1000 g
V300-20	Potassium bichromate	1000 g
V300-21	Sodium carbonate	1000 g
V300-22	Sodium chloride	1000 g
V300-23	Sodium hexametaphosphate	1000 g
V300-24	Sodium hydroxide	1000 g
V300-25	Sodium sulfate	1000 g
V300-26	Tricloroetilene	40 Kg
V300-27	Zinc chloride	1000 g
V300-28	Blue of methylene	100 ml
V300-29	Kaolinite	500 g
V300-30	Ion exchange resin	500 g



V300...

A	Mod.	Page
Abrasimeter/Tribometer	A112.....	27
Abrasion machine, Dorry	A111.....	29
Abrasion machine, Los Angeles.....	A075.....	21
Abrasion machine on stones, tribometer	A109.....	27
Absorption cone and tamper.....	S148.....	201
Accelerated curing of concrete.....	C307.....	121
Accelerated polishing machine, BS812.....	A128.....	28
Acidity test kit of water.....	S135.....	199
Adhesion tester, plaster.....	E142-02.....	164
Adhesion test Vialit apparatus.....	B053.....	54
Aggregate crushing value, BS812.....	A082.....	24
Aggregate impact value.....	A080.....	23
Air bath, bitumen.....	B016.....	39
Air compressors.....	V206.....	270
Air compressor, triaxial.....	S351.....	234
Air content of mortar : measurers	E029.....	146
Air drier.....	V201.....	270
Air entrainment meter, cement.....	E027.....	145
Air entrainment meter, concrete.....	C195.....	111
Air permeability apparatus, Blaine.....	E010.....	144
Air/water pressure system, triaxial.....	S350.....	234
Ammonia.....	V300-08.....	273
Ammonium carbonate	V300-09.....	273
Ammonium chloride.....	V300-10.....	273
Analytical balances	V064.....	253
Anemometer	VI48-01.....	264
Andreasen pipette	S144.....	200
Anhydride phosphoric.....	V300-11.....	273
Anvil for test hammers, concrete.....	C390.....	133
Armoured thermometers.....	VI62.....	263
Ash content.....	A022.....	9
Asphalt content, furnace.....	B005.....	36
Asphalt testing apparatus : Matta.....	B049.....	50
Aspirator pump	V202.....	270
Assessment of fines: methylene blue.....	S157.....	201
Augers, hand and powerhead	S092/S098.....	195
Autoclave for soundness, cement	E070.....	152
Autographic unconfined apparatus, soil	S130.....	198
Automatic servocontrolled system for testing machines	C124.....	95

B	Mod.	Page
Bacon sampler	B060.....	57
Bags, plastic.....	VI45.....	261
Balances.....	V014/V093.....	250/255
Balance, moisture determination	V023-01.....	251
Balance, mud, Baroid.....	E037-01.....	147
Ball penetration measuring apparatus	E031.....	146
Balloon density apparatus.....	S230/S233.....	220
Barium chloride	V300-13.....	273
Barton comb	A122.....	29
Basket, density.....	V041.....	251
Batching scales.....	V050.....	252
Bath, air, bitumen	B016.....	39

Baths, bitumen.....	B050.....	47
Bath, cooling for resilience tests, steel.....	H052.....	185
Baths, curing, cement	E136.....	162
Bath, Le Chatelier	E064.....	154
Beakers, pyrex.....	VI04.....	256
Beam moulds, concrete.....	C254.....	115
Bearing plate equipment, soil	S222/S226.....	219
Bending machine, steel	H065.....	186
Bending test on metals, accessory.....	H003-12.....	173
Benkelman beam apparatus	B100.....	66
Binder, automatic extraction.....	B008.....	37
Bits, diamond, for drilling machines.....	C340-05.....	127
Blaine air apparatus	E010.....	144
Blue of methylene	V300-28.....	273
Blue methylene test set.....	S157.....	201
Bond strength	E142-02.....	164
Bottles, plastic.....	VI18.....	261
Bottle roller.....	A102.....	26
Boxes, plastic.....	VI27.....	261
Breaking point, Fraas	B077.....	61
Briquette mould, cement.....	E108.....	161
Bristles.....	VI79.....	266
Broaching machine, steel	H057.....	183
Brushes.....	VI78.....	266
Buchner funnel	VI40.....	260
Buckets.....	VI28.....	261
Bulk cement samplers.....	E020.....	145
Bulk density of cement.....	E025.....	145
Bulk density of lime	E091.....	155
Bulk density measures, aggregates.....	A069.....	20
Bunsen burner.....	VI73.....	266
Burettes, graduated.....	VI43.....	259
Burner, butane.....	V201-01.....	270

C	Mod.	Page
Cabinet, freeze and thaw.....	C314.....	123
Cabinet with aspirator.....	B079.....	61
Calibration anvil for test hammers	C390.....	131
Calibration equipment for testing machines.....	C139/C155.....	104/106
Calibration unit for dials and extensometers	S390.....	247
Calcimeter, Dietrich Fruhling.....	A042.....	11
Calcium chloride	V300-14.....	273
Calipers, vernier.....	VI75.....	266
Calorimeter, heat of hydration.....	E062.....	151
Canin, corrosion equipment.....	C411.....	137
Capping equipment of concrete, sulphur method	C290.....	118
Carbide moisture meters.....	A025.....	10
Casagrande liquid limit.....	S170.....	205
CBR, moulding equipment.....	S200.....	210
CBR in situ apparatus.....	S220.....	216
CBR/Marshall testers.....	S213/S214.....	213/214
CBR/Proctor compactor	S198.....	209
CBR testing machines.....	S209/S211.....	212/213

Centrifuge extractors, bitumen	B011	38
Ceramic tiles abrasion tester	A109	27
Chapman flask	A029	11
Charpy pendulum impact tester	H060	183
Chattaway spatula	V192-08	268
Chemical products	V300	273
Chisel	V198	269
Chloride test kit of water	S136	199
Chloride titrator strips	A019-01	9
Cleansing bath, ultrasonic	A104	26
Cleveland flash point tester	B085	63
Climatic chamber freeze/thaw tests	C314	123
Cohesionless relative density, soil	S238	217
Cold bend testing machine, steel	H065	186
Colour soil and standard charts	S132/S133	199
Compacting factor apparatus	C185	109
Compaction apparatus, filler, BS812	A124	31
Compaction moulds and rammers, Proctor	S185/S194	206/207
Compaction permeameters, soil	S252	223
Compactor, CBR/Proctor	S198	209
Compactors, Marshall	B033	43
Compression/Flexural devices, cement	E170/E172	167
Compression/Flexural machines, cement	E151/E182	156/169
Compression machines: accessories, concrete	C097/C123	96/101
Compression testing machines, concrete	C011/C089	70/90
Compression testing machines, concrete, high stability	C089	80/90
Compression test on metals, accessori	H003-13	173
Compression machine 55kN, portable	C094	102
Compressometer, elasticity modulus, concrete	C130	103
Compressor, air	V206	270
Concrete test hammers	C380	133
Concrete workability meter	C189	110
Conductivity meter	V164	265
Cone and tamper, sand absorption	S148	201
Cone penetrometers, liquid limit	S165	204
Consistometer, Vébé	C183	108
Consolidation apparatus, oedometer	S260	224
Constant head permeameter, soil	S245	222
Containers, metallic	V116	267
Conversion frame, CBR	S221	216
Cooling bath for resilience test, metals	H052	185
Core cutter, Soil samplers	S084/S085	195
Core drill machine, rocks	A140	32
Corrosion instruments on reinforced bars	C411/C415	137/138
Cover to reinforcement, concrete	C396/C401	134
Crack detection microscope	C399	137
Cracking test mould, NF P15-434	E067	154
Crack width gauge	C408	136
Crucibles, porcelain and platinum	V117	260
Crucible tongs	V174	266
Crusher, aggregates	A092	25
Crushing coefficient machine, aggregates	A108	27

Crushing value apparatus, BS812	A082	24
Cube moulds, cement	E110/E133	161
Cube moulds, concrete	C228/C256	114/115
Curing baths and cabinets, cement	E134/E139	162/163
Curing room vaporisers	C311	122
Curing tanks, concrete	C305/C308	120/121
Cut back asphalt, distillation	B069	59
Cutting machines	C348/C351	128
Cutting machine, rocks	C351	30
Cutting machine, metals	C351	187
Cylinders, graduated	V098	256
Cylinder moulds, concrete	C228/C258	114/115

D	Mod.	Page
Data acquisition and processing, soil	S349/S364	236/245
De-airing tank, triaxial	S355	235
Dean stark	B076	61
Decanters, plastic	V102	261
Deflectometers, concrete	C402/C407	135/136
Demoulding oil	C265	115
Density baskets	V041	251
Density bottles, Gay Lussac	V105	201
Density chisel	V198	269
Density meter "non nuclear", bitumen	B110	67
Density of hardened concrete	V084	111
Density of soil in place	S230/S237	220/221
Density pick	V199	269
Desiccators	A035	11/259
Deval testing machine	A079	23
Dial indicators	S375/S383	247
Diamond bits for drilling machines	C340-05	127
Diamond blade for cutting machines	C350-12	128
Digital display unit for testing machines	C099	91
Direct/Residual shear machine	S280	226/228
Distillation of cut-back asphalts	B069	59
Distilled water	V300-05	273
Drier, warm air	V201	270
Drilling machines	C318/C324	124/127
Dropping ball apparatus, cement	E031	146
Dropping bottle	V124	258
Drying ovens	A001	8
Dry-ice maker, metals	H050	185
Ductilometer	B054	55
Duriez moulds	B095	65
Dynamometers, pull-off, bond strength	E142-02	164

E	Mod.	Page
Earth resistivity meter	S077	194
Electro-welded wire net test, accessory	H003-14	173
Elongation index of aggregates	A049	12
Emulsified asphalt distillation	B063	57
End-Over-End shaker	A116	29
Engler viscometer	B080	62
Erlenmeyer flasks	V106	256
Evaporating dishes, porcelain	V114	260

Extensometer, electronic, metals.....	H014.....	181
Extensometer, plasters.....	E080.....	155
Extraction of binder, centrifuge.....	B014.....	38
Extruder, Marshall moulds.....	SI 14.....	43
Extruders, soil.....	SI 12/SI 14.....	196

F	Mod.	Page
Falling head permeameter, soil.....	S246.....	222
Fatigue testing of asphalt beams.....	B049-30.....	53
Ferric alum, indicator solution.....	V300-07.....	273
Filler compaction apparatus, BS812.....	A124.....	31
Filter funnel.....	VI 38.....	259
Filter paper.....	V218.....	271
Fineness of cement: Blaine.....	E010.....	144
Fineness of fly ash by wet sieving.....	E017.....	144
Flakiness gauge.....	A070.....	19
Flakiness sieves.....	A049.....	12
Flame photometer.....	E063.....	151
Flash and fire tester, Cleveland.....	B085.....	63
Flasks, glassware.....	VI 06/VI 09.....	256/257
Flatness index grids.....	A048.....	12
Flexural/Compression machines, cement....	E160/E182.....	166/169
Flexural devices, cement.....	E172-01.....	167
Flexural device, concrete.....	C106.....	98
Flexural testing machines, concrete.....	C090/C093.....	85/88
Flexure device on concrete, accessory.....	H003-22.....	173
Flexure test on metals, accessory.....	H003-11.....	173
Flowing water sieve, cement.....	E016.....	144
Flow cone apparatus, cement.....	E038.....	147
Flow tables cement.....	E084/E090.....	156/157
Flow tables, concrete.....	C208.....	113
Fly ash fineness by wet sieving.....	E017.....	144
Footometer stability verification tester.....	C155.....	106
Fraas apparatus.....	B077.....	61
Free expansion, in plastic period, cement....	E060.....	150
Furnace, ignition method, asphalt.....	B005.....	36
Funnel groove, UNI 8997.....	E059.....	150
Funnels, glass.....	VI 19.....	258
Funnels, plastic.....	VI 35/VI 37.....	261
Funnel viscometer, Marsh, cement.....	E037.....	146

G	Mod.	Page
Gasometer, Dietrich-Fruhling.....	A042.....	11
Gauges, flakiness, length, shape.....	A070.....	19
Gay Lussac bottles.....	VI 08.....	257
Generator, electric, portable.....	C322.....	127
Geological hammer.....	A132.....	31
Gillmore apparatus.....	E058.....	147
Glassware.....	V098/VI 47.....	256/259
Glycerine.....	V300-16.....	273
Gloves.....	VI 77.....	266
Grinder – Polisher.....	A095.....	26
Grinding machine, concrete.....	C300.....	119
Gyratory compactor, Servopac.....	B048.....	49

H	Mod.	Pagina
Half cell corrosion meter, concrete.....	C411/C415.....	137/138
Hammers, steel and rubber.....	VI 93.....	269
Hammers, test of concrete.....	C380.....	133
Hammer, test on rocks.....	C381.....	30
Hardness test kit of water.....	SI 37.....	199
Heat of hydration calorimeter.....	E062.....	151
Hoek cells, rocks.....	A136.....	32
Hoffman screw clamp.....	V220.....	272
Hollow punches and tampers.....	SI 22/SI 23.....	197
Hot extraction apparatus, bitumen.....	B017.....	39
Hot plates.....	V200.....	269
Hubbard-Carmick bottles.....	VI 11.....	64/258
Hydration calorimeter, cement.....	E062.....	151
Hydraulic shrinkage determination of concrete.....	C365.....	130
Hydrochloric acid.....	V300-01.....	273
Hydrofluoric acid.....	V300-02.....	273
Hydrogen peroxide.....	V300-06.....	273
Hydrometers.....	VI 72.....	265
Hygrometer for moisture tests, concrete....	C375.....	130
Hygrometer, hair.....	VI 69.....	264

K	Mod.	Page
Kaolinite.....	V300-29.....	273
Kelly ball.....	C186.....	109
Knife, trimming.....	SI 25.....	197
K-Slump tester.....	C187.....	109
Kumagawa extractor.....	B061.....	40

I	Mod.	Page
Ignition method, furnace, asphalt.....	B005.....	36
Impact failure on tiles.....	C096.....	103
Impact pendulum tester, metals.....	H060.....	183
Impact testing machine, aggregates.....	A080.....	23
Impermeability tester, concrete.....	C435.....	140
Impurities test bottle.....	SI 32-01.....	199/258
In-situ CBR test set.....	S220.....	216
Ion exchange device.....	SI 40.....	198
Ion exchange resin.....	V300-30.....	273

J	Mod.	Page
Jar mills.....	A091.....	25
Joisel apparatus.....	C211.....	112
Jolting apparatus, cement.....	E130.....	161

L	Mod.	Page
Ladle.....	VI 86-01.....	269
Lathe, soil.....	SI 20.....	197
Le Chatelier flask.....	E014.....	144
Le Chatelier mould.....	E065.....	154
Le Chatelier water bath.....	E064.....	154

GENERAL INDEX

Length comparator, cement.....	E078.....	153
Length gauge, aggregates.....	A071.....	19
Lightweight dynamic penetrometer.....	S050.....	190
Limits of soils.....	S165/S178.....	204/205
Linear shrinkage mould, soil.....	S176.....	204
Loads in piles.....	S228.....	217
Load proving rings.....	S370.....	246
Los Angeles abrasion machine.....	A075.....	21
Loss on heating oven, asphalt.....	B064.....	58

M	Mod.	Page
Magnetic stirrer/heater.....	B073-01.....	269
Mallets, rubber and steel.....	V195.....	269
Marking-off machine, metals.....	H020.....	183
Marking pencil.....	V147-01.....	259
Marshall compactors.....	B033.....	43
Marshall load frames.....	B042.....	44
Marshall moulding equipment.....	B029.....	42
Marshall water baths.....	B050.....	47
Marsh funnel viscometer, cement.....	E037.....	146
Matta, asphalt testing apparatus.....	B049.....	50
Max. Min. thermometer.....	V163.....	263
Measures, unit weight, concrete.....	C199/C205.....	112
Measuring graduated cylinders.....	V098.....	256
Mercury (pure).....	V300-17.....	273
Metal detectors.....	C396/C401.....	134
Methylene blue test set.....	S157.....	201
Micro-Covermeter.....	C401.....	134
Micro Deval machine.....	A078.....	22
Microlance moisture-temperature tester.....	A021.....	11
Microscope, crack detection.....	C399.....	137
Mill jar.....	A091.....	25
Mixers, bitumen.....	B025.....	41
Mixer, dry.....	A093.....	25
Mixers, concrete.....	C160/C165.....	107
Mixers, mortar.....	E093/E095.....	158/159
Mixing bowls.....	V116.....	267
Mobile laboratories.....	- - -.....	141
Modem for connection to telephone net.....	H009-02.....	181
Modified Proctor test.....	S186.....	206
Mohs stone hardness kit.....	A115.....	28
Moisture balances.....	V023-01.....	251
Moisture density (Proctor test).....	S185/S194.....	205/206
Moisture density gauge, nuclear.....	S060.....	192
Moisture meter, Microlance.....	A021.....	11
Moisture testers, aggregates.....	A025.....	10
Mortar and pestle, porcelain.....	V112.....	260
Mortar and pestle, stainless.....	V112-05.....	267
Mot straight edge.....	B099.....	65
Moulds, cement, prisms, briquettes.....	E100/E112.....	160/161
Moulds, cement, shrinkage and expansion.....	E072/E115.....	152/153
Moulds, concrete.....	C228/C258.....	114/115
Mould: Le Chatelier.....	E065.....	154
Mould, Marshall.....	B029.....	42
Mud Baroid balance.....	E037-01.....	147
Muffle ovens.....	A022.....	9

N	Mod.	Page
Needle vibrators, poker, concrete.....	C271.....	116
Nitric acid.....	V300-03.....	273
Null indicator, triaxial.....	S353.....	235

O	Mod.	Page
Oedometer.....	S260.....	224
Oil, demoulding moulds.....	C265.....	115
Ohaus balances.....	V014/V018.....	250
Organic matter test set.....	S138.....	199
Ovens, laboratory.....	A001.....	8
Oven, loss on heating, thin film.....	B064.....	58
Oven, rolling thin film.....	B066.....	59

P	Mod.	Page
Pans, metallic.....	V182.....	267
Paraffin wax.....	V300-19.....	273
Particle size sedimentation.....	S144/S155.....	200
Pat test.....	E082.....	155
Pavement density meter.....	B110.....	67
Pendulum impact resilience tester, metals.....	H060.....	183
Pendulum skid tester.....	A110.....	28
Penetrometers, bitumen.....	B056.....	56
Penetrometers, concrete.....	C194/C213.....	110
Penetrometers, liquid limit, soil.....	S165.....	204
Penetrometers, pocket, soil.....	S065/S071.....	193
Penetrometer, Proctor.....	S088.....	194
Penetrometer, proving ring, soil.....	S086.....	194
Penetrometers, static and dynamic.....	S050/S063.....	190/191
Pensky Martens tester.....	B094.....	64
Percentage refusal, PRD.....	B097.....	65
Permeability, air, Blaine.....	E010.....	144
Permeability apparatus, concrete.....	C430/C431.....	139/140
Permeability of rocks.....	A145.....	33
Permeameter, bitumen.....	B024.....	40
Permeameters, soil.....	S245/S254.....	222/223
Personal Computer for steel testing machines.....	H009-01.....	181
Petri dish.....	V123.....	258
PH meters.....	V214.....	271
Photometer, flame.....	E063.....	151
Picks.....	V197.....	269
Pipettes, graduated.....	V142.....	259
Plaster extensometer.....	E080.....	155
Plasticity meter, concrete.....	C190.....	110
Plastic limit set, soil.....	S178.....	205
Plastic products.....	V102/V145.....	261
Plate bearing test, bitumen.....	B101.....	66
Plate bearing test, soil.....	S222/S226.....	218/219
Plunger penetration apparatus, cement.....	E083.....	154
Polisher – Grinder.....	A095.....	26
Polishing machine accelerated.....	A128.....	28
Porcelain products.....	V112/V140.....	260
Porosimeters, cement.....	E027.....	145

Porosimeters, concrete.....	C195.....	111
Potassium bichromate.....	V300-20.....	273
Printer for steel testing machines.....	H009-03.....	181
Prism moulds, cement.....	E100/E112.....	160/161
Prism moulds, concrete.....	C254.....	115
Proctor/CBR compactor.....	S198.....	209
Proctor test: moisture/density.....	S185/S194.....	206
Profometer, metal detector.....	C396.....	134
Proving rings, load.....	S370.....	246
Pull-Off, bond strength testers.....	E142-02.....	164
Pull-Out tester.....	C376.....	129
Pyknometers, glass.....	V103.....	256
Pyknometers, soil.....	S147.....	201
Pyknometer, 10 litres, vacuum, bitumen.....	B067.....	48

Q	Mod.	Page
Quantab chloride strips.....	A019-01.....	9
Quartering canvas.....	A085.....	24

R	Mod.	Page
Rain gauges.....	V167.....	264
Ram, rapid analysis machine.....	C215.....	113
Reaction container.....	A030.....	11
Reagent bottles.....	V108-10.....	257
Reagent products.....	V300.....	273
Recovery solvent, still.....	B021.....	40
Redwood viscometer.....	B083.....	62
Reflux extractor.....	B019.....	39
Refusal percentage density test.....	B097.....	65
Relative density cohesionless, soil.....	S238.....	217
Residue of specified penetration, bitumen.....	B062.....	58
Resilience test pendulum impact tester; steel.....	H060.....	183
Resistivity meter, concrete.....	C413.....	138
Retention water apparatus, cement.....	E039.....	147
Riffle boxes.....	A062.....	20
Ring and ball apparatus.....	B072.....	60
Rock triaxial Hoek cells.....	A136.....	32
Roller bottle.....	A102.....	26
Rolling thin film oven.....	B066.....	59
Rubber heated pestle.....	V113.....	260
Rules.....	V176.....	266

S	Mod.	Page
Sampler, Bacon.....	B060.....	57
Samplers, bulk and packaged, cement.....	E020/E021.....	145
Sampler, hollow punch, soil.....	S118.....	196
Sampler dia. 38mm, soil.....	S053.....	190
Sampler, core cutter, soil.....	S084.....	195
Sample splitters, aggregates.....	A062.....	20
Sand absorption cone + tamper.....	S148.....	201
Sand bath.....	V241.....	273
Sand density cone, pouring apparatus.....	S234/S237.....	221

Sand equivalent value.....	S158.....	202
Saybolt viscometer.....	B087.....	63
Schmidt test hammers.....	C382.....	133
Scoops.....	V183.....	268
Seismograph.....	S079.....	194
Servo-Unit power system for testing machines.....	C098.....	91
Setting time of cement.....	E040/E054.....	148/150
Shaker, end-over-end.....	A116.....	29
Shakers for sieves.....	A060.....	17
Shape gauge, aggregates.....	A072.....	19
Shear apparatus direct/residual, soil.....	S280.....	226/228
Shear box assembly, rocks.....	A129.....	31
Shear vane, pocket, soil.....	S075.....	193
Shrinkage limit set, soil.....	S175.....	204
Shrinkage mould, soil.....	S176.....	204
Shrinkage of concrete.....	C366.....	130
Shovel.....	V196.....	269
Silica gel.....	V300-15.....	273
Silver nitrate 10 N.....	V300-12.....	273
Simrup apparatus.....	C135.....	103
Sieves.....	A052.....	13
Sieve grids, flakiness.....	A048.....	12
Sieve shakers.....	A060.....	17
Siphon can apparatus.....	A084.....	24
Skid tester.....	A110.....	28
Slump cone, Abrams.....	C180.....	108
Slump flow table, concrete.....	C192.....	109
Sodium carbonate.....	V300-21.....	273
Sodium chloride.....	V300-22.....	273
Sodium hexametaphosphate.....	V300-23.....	273
Sodium hydroxide.....	V300-24.....	273
Sodium sulfate.....	V300-25.....	273
Softening point, bitumen.....	B072.....	60
Software for steel testing machines.....	H009.....	177/180
Solvent recovery still.....	B021.....	40
Soundness of cement: Autoclave.....	E070.....	152
Soundness: Le Chatelier.....	E065.....	154
Spatulas.....	V192.....	268
Specific gravity balances.....	V091.....	252
Specific gravity bottles.....	V108.....	257
Specific gravity frame.....	V084.....	253
Speedy moisture testers.....	A025.....	10
Spliters for aggregates.....	A062.....	20
Splitting tensile device, concrete.....	C100.....	97
Spoon.....	V186.....	269
Stabilized soil strength.....	S195.....	208
Stands, metal.....	V219.....	272
Stirrer/heater, magnetic.....	B073-01.....	269
Stirring rods.....	V147.....	259
Stop watch.....	V170.....	265
Strain gauges, concrete.....	C360.....	129
Sulphate test strips.....	A019-03.....	9
Sulphuric acid.....	V300-04.....	273

GENERAL INDEX

T	Mod.	Page
Table, flow of concrete	C208.....	113
Table, flow or mortar	E084/E090.....	156/157
Table vibrators, concrete	C278.....	117
Tag closed and open viscometer	B092.....	64
Tanks, curing, concrete	C305/C308.....	120/121
Tar (Redwood) viscometer	B083.....	62
Tensile steel testing machines	H003/H008.....	172/176
Thermo-hygrograph	V168.....	264
Thermo-hygrometer	V165.....	265
Thermometers	V150/V164.....	262/263
Thermometer, recording, concrete	C303/C310.....	122/123
Thin film oven	B064.....	58
Timing device	V171.....	265
Tins, metallic	V122.....	267
Tongs, crucible	V174.....	266
Tool kit	V222.....	272
Triaxial equipment	S301/S364.....	229/245
Triaxial rock Hoeck cells	A136.....	32
Tribometer – Abrasimeter	A112.....	27
Tricloroetilene	V300-26.....	273
Trolley	V224.....	272
Trowels	V188.....	269
Tubing, rubber	V230.....	272

U	Mod.	Page
Unconfined compression testers	S130.....	198
Ultrasonic cleansing bath	A104.....	26
Ultrasonic testers, concrete	C368/C370.....	131/132
Unit weight measures, concrete	C199/C205.....	112
Universal multi-speed load frame soil/bitumen	S212/S215.....	214/215
Universal steel testing machines	H003/H008.....	172/176
Universal Tensile/compression machine, steel/concrete	H010/H011.....	184/185
Universal UTM-5P testing machine, bitumen	B049-10.....	51
Universal UTM-25 testing machine, bitumen	B049-20.....	54

V	Mod.	Page
Vacuum pumps	V203.....	270
Vacuum pycnometer, 10 litres, bitumen	B067.....	48
Vane, laboratory, soil	S080.....	192
Vane shear, pocket, soil	S075.....	193
Vaporisers, curing rooms	C311/C313.....	122
Vaseline oil	V300-18.....	273
Vébé consistometer	C183.....	108
Vernier calipers	V175.....	266
Vialit binder adhesion tester	B053.....	54
Vibrating compaction hammer, soil	S197.....	208
Vibrating machine cement cube 70,7mm	E132.....	161
Vibrating needles and tables, concrete	C271/C280.....	116/117
Vibration-free assembly for balances	V068.....	253

Vicat apparatus, automatic and manual	E040/E054.....	148/150
Viscometer, Engler	B080.....	62
Viscometer, Saybolt	B087.....	63
Viscometer, Tag closed/open	B092.....	64
Viscometer, Tar (Redwood, BRTA)	B083.....	62
Viscosity, Marsh funnel, cement	E037.....	146
Voids of aggregates	A069.....	20
Volumeter of aggregates	A086.....	24
Volumetric flasks, glass	V109.....	257

W	Mod.	Page
Walz apparatus	C188.....	109
Wash bottles	V120.....	261
Watch glass	V115.....	258
Watch, stop	V170.....	265
Water baths, curing of cement	E134/E139.....	162/163
Water bath: Le Chatelier	E064.....	154
Water baths, Marshall	B050.....	47
Water bath for penetrometer, bitumen	B058.....	57
Water flowing sieve device, cement	E016.....	144
Water impermeability tester, concrete	C435.....	140
Water in bituminous materials	B076.....	61
Water level indicator, soil	S061.....	192
Water permeability testers, concrete	C430/C431.....	139/140
Water retention apparatus, cement	E039.....	147
Water stills	V212.....	271
Water test set for concrete	C220.....	112
Weather station	V148.....	264
Weighting bottles	V110.....	258
Wet washing sieve	A045.....	16
Whatman paper	V218.....	271
Wheelbarrow	V226.....	272
Windsor probe	C410.....	137
Workability apparatus, cement	E081.....	155
Workability apparatus, concrete	C189.....	110

Z	Mod.	Page
Zinc chloride	V300-27.....	273

X	Mod.	Page
X-Y stability/flow software, bitumen	B043-01.....	45