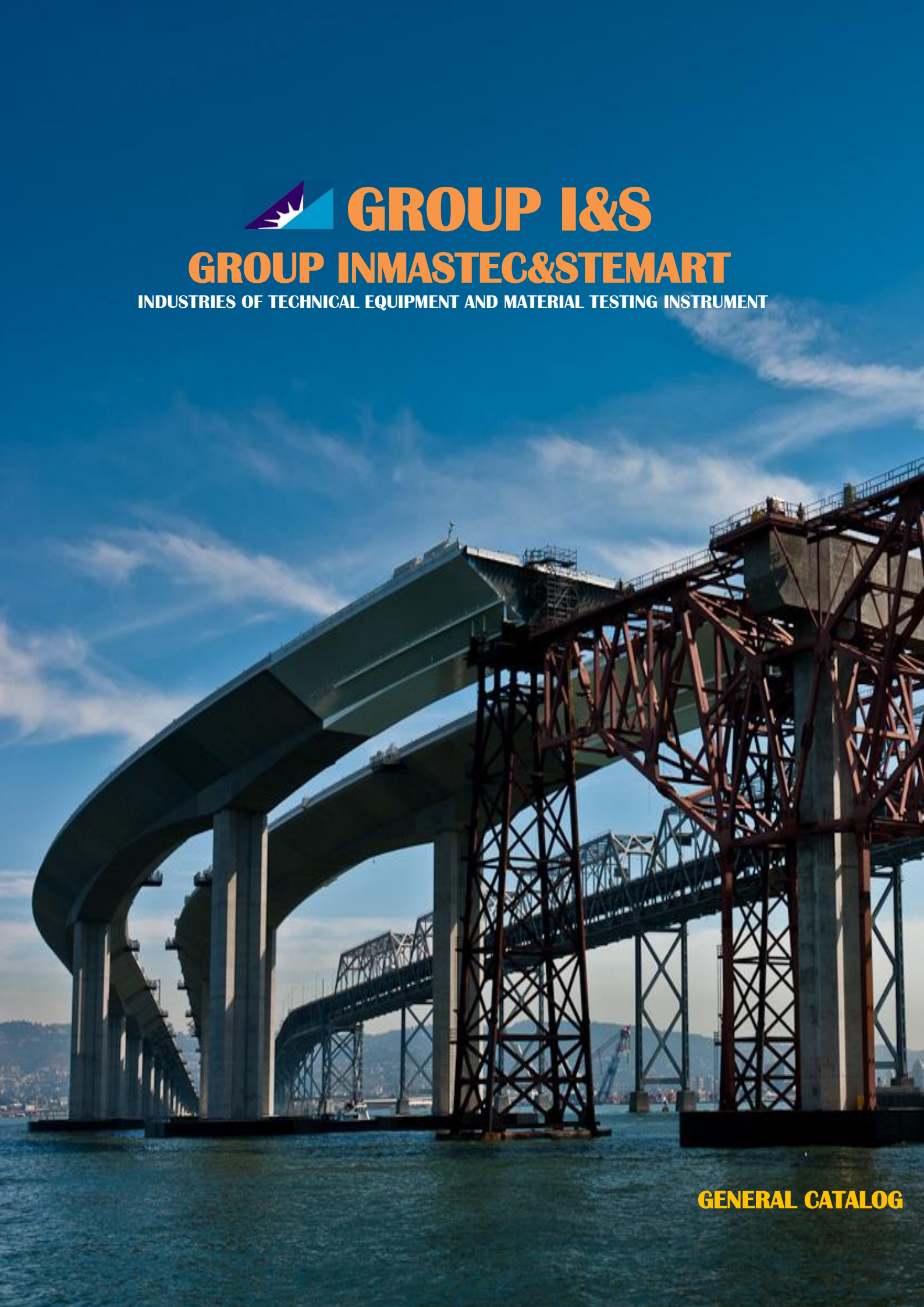
GROUP I&S

GROUP INMASTEC&STEMART

INDUSTRIES OF TECHNICAL EQUIPMENT AND MATERIAL TESTING INSTRUMENT



GENERAL CATALOG

GROUP I&S

GROUP I&S

Group I&S facing new challenges, offering an advanced solution for material testing "in situ" or in the laboratory for aggregates, rocks, bitumen, cement, mortar, concrete, steel, soils and materials in general.

The manufacturing program with a wide range of products, equipment and machinery is done with a staff of more than 25 years of experience in the manufacture and distribution of standardized equipment for quality control testing in various areas of laboratory, research, construction, universities, public works and engineering. Also we cover all the needs of accredited laboratories.

The Group I&S main activities are:

- Production and distribution of testing equipment for concrete, cement, aggregates, asphalt, soils, roads, steel, etc. and I + D, according to the current European and international standards UNE, EN, ASTM, BS, AFNOR, DIN, AASHTO, UNI, NF P and ISO, etc.

- General Material and scientific instrumentation.

- Projects and facilities for laboratory furniture.

- Technical assistance and services.

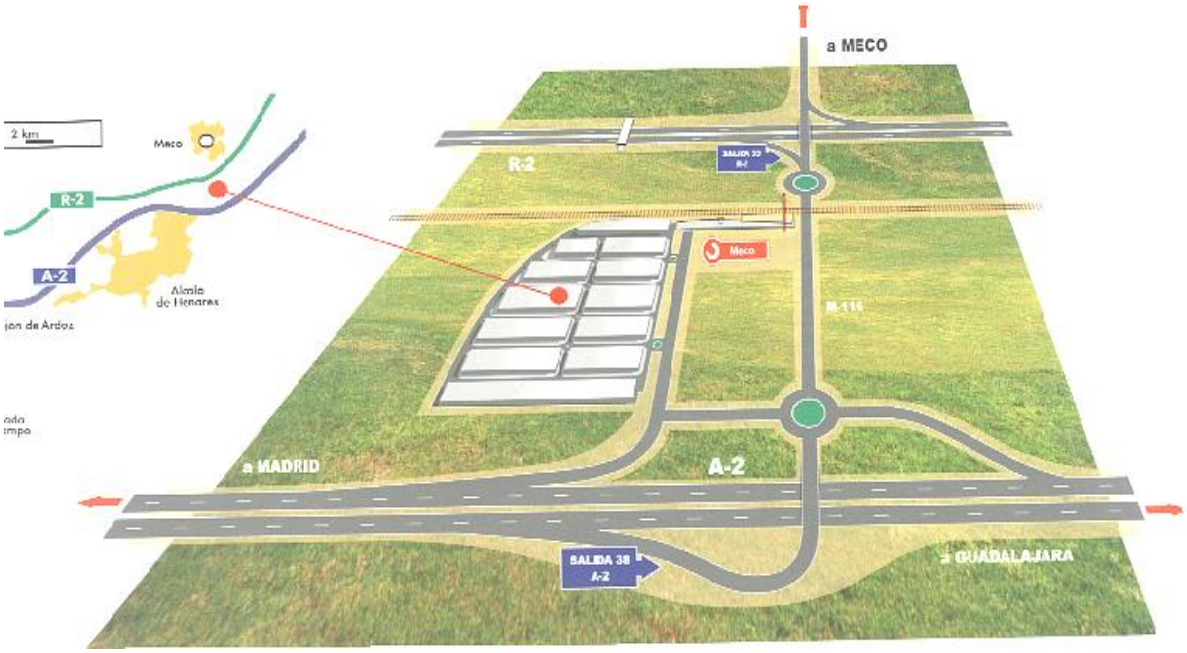
Our main customers are; accredited testing laboratories and private research, manufacturers of concrete, cement, asphalt, distributors, contractors, universities and official organizations. We also partner with research centers and universities in the world.

Please note that this catalog is an overview and basic equipment, our manufacturing machinery. Please do not hesitate to contact us to customize your deal with all the other needs they may have.

We take this opportunity they give us to present our thanks on behalf of all staff of **GROUP I&S** for the trust and support you have placed in our company**.**

GROUP I&S

HOW TO REACH US



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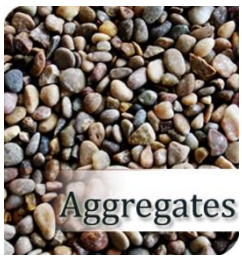
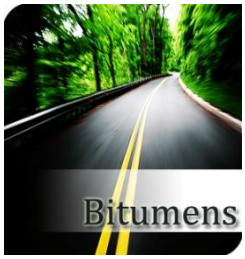


AGGREGATES - ROCKS

Classification tests of the mining activity. Measure the resistance to sliding wear coefficient and drying

7



BITUMENS - ASPHALTS

Compaction tests, Marshall compression, viscosity, extraction, and indirect tensile deformation

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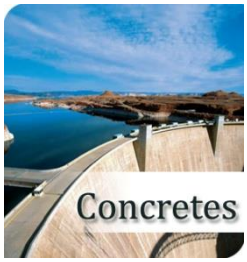


CONCRETES

Compression tests (automatic servo), flexural testing, indirect tensile test-tube, control and management modules, displacement and deformation

67

CEMENTS - MORTARS

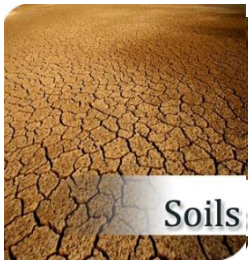
Test flexion / compression of cements and mortars, strength, compaction and storage of specimens

103

STEELS

Tensile tests of metal bars, folded and unfolded, impact and hardness

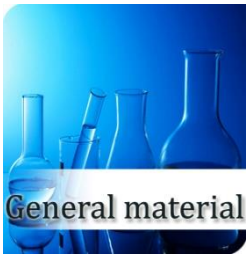
123



SOILS

Compression tests, direct/residual shear test, dimensional consolidation, compaction, density, CBR and Proctor

135



GENERAL MATERIAL

Porcelain, glass, thermometers, hydrometers, thermostatic baths, mixers, scales and consumables.

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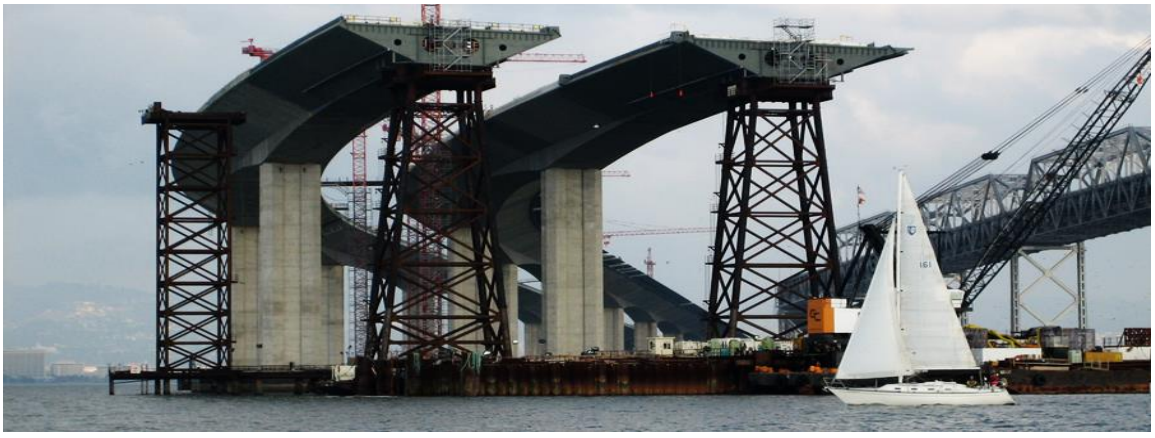
GROUP I&S



Aggregates - Rocks

GROUP I&S

GROUP I&S

SIEVES TABLE FROM Ø 200 TO 500 MM. MADE ENTIRELY STAINLESS STEEL BRAID, ACCORDING TO UNE-EN 933/2, ISO 3310/1, 7050/3, ASTM E11, BS 410, DIN 4187, NFX11-504, AASHTO T27 LABELLING A MICRO-PERCUSSION WITH SERIAL NUMBER EACH

Aperture ISO 3310/1 mm	ASTM E-11	Ø 200	Ø203 (8")	Ø250	Ø300	Ø 305 (12")	Ø400	Ø450	Ø500
125	5"	A001.01	A002.01	A003.01	A004.01	A005.01	A006.01	A007.01	A008.01
112		A001.02	A002.02	A003.02	A004.02	A005.02	A006.02	A007.02	A008.02
106	4,24"	A001.03	A002.03	A003.03	A004.03	A005.03	A006.03	A007.03	A008.03
100	4"	A001.04	A002.04	A003.04	A004.04	A005.04	A006.04	A007.04	A008.04
90,00	3½"	A001.05	A002.05	A003.05	A004.05	A005.05	A006.05	A007.05	A008.05
80,00		A001.06	A002.06	A003.06	A004.06	A005.06	A006.06	A007.06	A008.06
75,00	3"	A001.07	A002.07	A003.07	A004.07	A005.07	A006.07	A007.07	A008.07
71,00		A001.08	A002.08	A003.08	A004.08	A005.08	A006.08	A007.08	A008.08
63,00	2½"	A001.09	A002.09	A003.09	A004.09	A005.09	A006.09	A007.09	A008.09
56,00		A001.10	A002.10	A003.10	A004.10	A005.10	A006.10	A007.10	A008.10
50,00	2"	A001.11	A002.11	A003.11	A004.11	A005.11	A006.11	A007.11	A008.11
45,00	1¾"	A001.12	A002.12	A003.12	A004.12	A005.12	A006.12	A007.12	A008.12
40,00		A001.13	A002.13	A003.13	A004.13	A005.13	A006.13	A007.13	A008.13
37,50	1½"	A001.14	A002.14	A003.14	A004.14	A005.14	A006.14	A007.14	A008.14
35,50		A001.15	A002.15	A003.15	A004.15	A005.15	A006.15	A007.15	A008.15
31,50	1¼"	A001.16	A002.16	A003.16	A004.16	A005.16	A006.16	A007.16	A008.16
28,00		A001.17	A002.17	A003.17	A004.17	A005.17	A006.17	A007.17	A008.17
26,50	1,06"	A001.18	A002.18	A003.18	A004.18	A005.18	A006.18	A007.18	A008.18
25,00	1"	A001.19	A002.19	A003.19	A004.19	A005.19	A006.19	A007.19	A008.19
22,40	7/8"	A001.20	A002.20	A003.20	A004.20	A005.20	A006.20	A007.20	A008.20
20,00		A001.21	A002.21	A003.21	A004.21	A005.21	A006.21	A007.21	A008.21
19,00	¾"	A001.22	A002.22	A003.22	A004.22	A005.22	A006.22	A007.22	A008.22
18.00		A001.23	A002.23	A003.23	A004.23	A005.23	A006.23	A007.23	A008.23
16,00	5/8"	A001.24	A002.24	A003.24	A004.24	A005.24	A006.24	A007.24	A008.24
14,00		A001.25	A002.25	A003.25	A004.25	A005.25	A006.25	A007.25	A008.25
13,20	0,53"	A001.26	A002.26	A003.26	A004.26	A005.26	A006.26	A007.26	A008.26
12,50	½"	A001.27	A002.27	A003.27	A004.27	A005.27	A006.27	A007.27	A008.27
11,20	7/16"	A001.28	A002.28	A003.28	A004.28	A005.28	A006.28	A007.28	A008.28
10,00		A001.29	A002.29	A003.29	A004.29	A005.29	A006.29	A007.29	A008.29
9.50	3/8"	A001.30	A002.30	A003.30	A004.30	A005.30	A006.30	A007.30	A008.30
9,00		A001.31	A002.31	A003.31	A004.31	A005.31	A006.31	A007.31	A008.31
8,00	5/16"	A001.32	A002.32	A003.32	A004.32	A005.32	A006.32	A007.32	A008.32
7,10		A001.33	A002.33	A003.33	A004.33	A005.33	A006.33	A007.33	A008.33
6,70	0,265"	A001.34	A002.34	A003.34	A004.34	A005.34	A006.34	A007.34	A008.34
6,30	¼"	A001.35	A002.35	A003.35	A004.35	A005.35	A006.35	A007.35	A008.35
5,60	3½"	A001.36	A002.36	A003.36	A004.36	A005.36	A006.36	A007.36	A008.36
5,00		A001.37	A002.37	A003.37	A004.37	A005.37	A006.37	A007.37	A008.37
4,75	4	A001.38	A002.38	A003.38	A004.38	A005.38	A006.38	A007.38	A008.38
4,50		A001.39	A002.39	A003.39	A004.39	A005.39	A006.39	A007.39	A008.39
4,00	5	A001.40	A002.40	A003.40	A004.40	A005.40	A006.40	A007.40	A008.40
3,55		A001.41	A002.41	A003.41	A004.41	A005.41	A006.41	A007.41	A008.41
3,35	6	A001.42	A002.42	A003.42	A004.42	A005.42	A006.42	A007.42	A008.42
3,15		A001.43	A002.43	A003.43	A004.43	A005.43	A006.43	A007.43	A008.43
2,80	7	A001.44	A002.44	A003.44	A004.44	A004.45	A006.44	A007.44	A008.44

SIEVES TABLE FROM Ø 200 TO 500 MM. MADE ENTIRELY STAINLESS STEEL BRAID, ACCORDING TO UNE-EN 933/2, ISO 3310/1, 7050/3, ASTM E11, BS 410, DIN 4187, NFX11-504, AASHTO T27 LABELLING A MICRO-PERCUSSION WITH SERIAL NUMBER EACH

Aperture ISO3310/1 mm	ASTM E-11	Ø 200	Ø203 (8")	Ø250	Ø300	Ø 305 (12")	Ø400	Ø450	Ø500
2,50		A001.45	A002.45	A003.45	A004.45	A005.45	A006.45	A007.45	A008.45
2,36	8	A001.46	A002.46	A003.46	A004.46	A005.46	A006.46	A007.46	A008.46
2,24		A001.47	A002.47	A003.47	A004.47	A005.47	A006.47	A007.47	A008.47
2,00	10	A001.48	A002.48	A003.48	A004.48	A005.48	A006.48	A007.48	A008.48
1,80		A001.49	A002.49	A003.49	A004.49	A005.49	A006.49	A007.49	A008.49
1,70	12	A001.50	A002.50	A003.50	A004.50	A005.50	A006.50	A007.50	A008.50
1,60		A001.51	A002.51	A003.51	A004.51	A005.51	A006.51	A007.51	A008.51
1,40	14	A001.52	A002.52	A003.52	A004.52	A005.52	A006.52	A007.52	A008.52
1,25		A001.53	A002.53	A003.53	A004.53	A005.53	A006.53	A007.53	A008.53
1,18	16	A001.54	A002.54	A003.54	A004.54	A005.54	A006.54	A007.54	A008.54
1,12		A001.55	A002.55	A003.55	A004.55	A005.55	A006.55	A007.55	A008.55
1,00	18	A001.56	A002.56	A003.56	A004.56	A005.56	A006.56	A007.56	A008.56
0,900		A001.57	A002.57	A003.57	A004.57	A005.57	A006.57	A007.57	A008.57
0,850	20	A001.58	A002.58	A003.58	A004.58	A005.58	A006.58	A007.58	A008.58
0,800		A001.59	A002.59	A003.59	A004.59	A005.59	A006.59	A007.59	A008.59
0,710	22	A001.60	A002.60	A003.60	A004.60	A005.60	A006.60	A007.60	A008.60
0,630		A001.61	A002.61	A003.61	A004.61	A005.61	A006.61	A007.61	A008.61
0,600	30	A001.62	A002.62	A003.62	A004.62	A005.62	A006.62	A007.62	A008.62
0,560		A001.63	A002.63	A003.63	A004.63	A005.63	A006.63	A007.63	A008.63
0,500	35	A001.64	A002.64	A003.64	A004.64	A005.64	A006.64	A007.64	A008.64
0,450		A001.65	A002.65	A003.65	A004.65	A005.65	A006.65	A007.65	A008.65
0,425	40	A001.66	A002.66	A003.66	A004.66	A005.66	A006.66	A007.66	A008.66
0,400		A001.67	A002.67	A003.67	A004.67	A005.67	A006.67	A007.67	A008.67
0,355	45	A001.68	A002.68	A003.68	A004.68	A005.68	A006.68	A007.68	A008.68
0,315		A001.69	A002.69	A003.69	A004.69	A005.69	A006.69	A007.69	A008.69
0,300	50	A001.70	A002.70	A003.70	A004.70	A005.70	A006.70	A007.70	A008.70
0,280		A001.71	A002.71	A003.71	A004.71	A005.71	A006.71	A007.71	A008.71
0,250	60	A001.72	A002.72	A003.72	A004.72	A005.72	A006.72	A007.72	A008.72
0,224		A001.73	A002.73	A003.73	A004.73	A005.73	A006.73	A007.73	A008.73
0,212	70	A001.74	A002.74	A003.74	A004.74	A005.74	A006.74	A007.74	A008.74
0,200		A001.75	A002.75	A003.75	A004.75	A005.75	A006.75	A007.75	A008.75
0.180	80	A001.76	A002.76	A003.76	A004.76	A001.76	A006.76	A007.76	A008.76
0,160		A001.77	A002.77	A003.77	A004.77	A005.77	A006.77	A007.77	A008.77
0,150	100	A001.78	A002.78	A003.78	A004.78	A005.78	A006.78	A007.78	A008.78
0,140		A001.79	A002.79	A003.79	A004.79	A005.79	A006.79	A007.79	A008.79
0,125	120	A001.80	A002.80	A003.80	A004.80	A005.80	A006.80	A007.80	A008.80
0,112		A001.81	A002.81	A003.81	A004.81	A005.81	A006.81	A007.81	A008.81
0,106	140	A001.82	A002.82	A003.82	A004.82	A005.82	A006.82	A000.82	A008.82
0,100		A001.83	A002.83	A003.83	A004.83	A005.83	A006.83	A007.83	A008.83
0,090	170	A001.84	A002.84	A003.84	A004.84	A005.84	A006.84	A007.84	A008.84
0,080		A001.85	A002.85	A003.85	A004.85	A005.85	A006.85	A007.85	A008.85
0,075	200	A001.86	A002.86	A003.86	A004.86	A005.86	A006.86	A007.86	A008.86
0,071		A001.87	A002.87	A003.87	A004.87	A005.87	A006.87	A007.87	A008.87
0,063	230	A001.88	A002.88	A003.88	A004.88	A005.88	A006.88	A007.88	A008.88
0.056		A001.89	A002.89	A003.89	A004.89	A005.89	A006.89	A007.89	A008.89
0,053	270	A001.90	A002.90	A003.90	A004.90	A005.90	A006.90	A007.90	A008.90
0.050		A001.91	A002.91	A003.91	A004.91	A005.91	A006.91	A007.91	A008.91
0,045	325	A001.92	A002.92	A003.92	A004.92	A005.92	A006.92	A007.92	A008.92
0,040		A001.93	A002.93	A003.93	A004.93	A005.93	A006.93	A007.93	A008.93

- The openings also meet standards BS and DIN

SIEVES TABLE FROM Ø 200 TO 500 MM. FULLY BUILT IN STAINLESS STEEL MESH SQUARE HOLS PERFORATED PLATE AND UNE-EN 933/2, ISO 3310/2, 7050/4, ASTM E11, BS 410, DIN 4187, NFX11-504, AASHTO T27 LABELLING A MICRO-PERCUSSION WITH SERIAL NUMBER OF EACH

Aperture ISO3310/1 mm	ASTM E-11	Ø 200	Ø203 (8")	Ø250	Ø300	Ø 305 (12")	Ø400	Ø450	Ø500
125	5"	A011.01	A012.01	A013.01	A014.01	A015.01	A016.01	A017.01	A018.01
112		A011.02	A012.02	A013.02	A014.02	A015.02	A016.02	A017.02	A018.02
106	4,24"	A011.03	A012.03	A013.03	A014.03	A015.03	A016.03	A017.03	A018.03
100	4"	A011.04	A012.04	A013.04	A014.04	A015.04	A016.04	A017.04	A018.04
90,00	3½"	A011.05	A012.05	A013.05	A014.05	A015.05	A016.05	A017.05	A018.05
80,00		A011.06	A012.06	A013.06	A014.06	A015.06	A016.06	A017.06	A018.06
75,00	3"	A011.07	A012.07	A013.07	A014.07	A015.07	A016.07	A017.07	A018.07
71,00		A011.08	A012.08	A013.08	A014.08	A015.08	A016.08	A017.08	A018.08
63,00	2½"	A011.09	A012.09	A013.09	A014.09	A015.09	A016.09	A017.09	A018.09
56,00		A011.10	A012.10	A013.10	A014.10	A015.10	A016.10	A017.10	A018.10
50,00	2"	A011.11	A012.11	A013.11	A014.11	A015.11	A016.11	A017.11	A018.11
45,00	1¾"	A011.12	A012.12	A013.12	A014.12	A015.12	A016.12	A017.12	A018.12
40,00		A011.13	A012.13	A013.13	A014.13	A015.13	A016.13	A017.13	A018.13
37,50	1½"	A011.14	A012.14	A013.14	A014.14	A015.14	A016.14	A017.14	A018.14
35,50		A011.15	A012.15	A013.15	A014.15	A015.15	A016.15	A017.15	A018.15
31,50	1¼"	A011.16	A012.16	A013.16	A014.16	A015.16	A016.16	A017.16	A018.16
28,00		A011.17	A012.17	A013.17	A014.17	A015.17	A016.17	A017.17	A018.17
26,50	1,06"	A011.18	A012.18	A013.18	A014.18	A015.18	A016.18	A017.18	A018.18
25,00	1"	A011.19	A012.19	A013.19	A014.19	A015.19	A016.19	A017.19	A018.19
22,40	7/8"	A011.20	A012.20	A013.20	A014.20	A015.20	A016.20	A017.20	A018.20
20,00		A011.21	A012.21	A013.21	A014.21	A015.21	A016.21	A017.21	A018.21
19,00	¾"	A011.22	A012.22	A013.22	A014.22	A015.22	A016.22	A017.22	A018.22
18.00		A011.23	A012.23	A013.23	A014.23	A015.23	A016.23	A017.23	A018.23
16,00	5/8"	A011.24	A012.24	A013.24	A014.24	A015.24	A016.24	A017.24	A018.24
14,00		A011.25	A012.25	A013.25	A014.25	A015.25	A016.25	A017.25	A018.25
13,20	0,53"	A011.26	A012.26	A013.26	A014.26	A015.26	A016.26	A017.26	A018.26
12,50	½"	A011.27	A012.27	A013.27	A014.27	A015.27	A016.27	A017.27	A018.27
11,20	7/16"	A011.28	A012.28	A013.28	A014.28	A015.28	A016.28	A017.28	A018.28
10,00		A011.29	A012.29	A013.29	A014.29	A015.29	A016.29	A017.29	A018.29
9.50	3/8"	A011.30	A012.30	A013.30	A014.30	A015.30	A016.30	A017.30	A018.30
9,00		A011.31	A012.31	A013.31	A014.31	A015.31	A016.31	A017.31	A018.31
8,00	5/16"	A011.32	A012.32	A013.32	A014.32	A015.32	A016.32	A017.32	A018.32
7,10		A011.33	A012.33	A013.33	A014.33	A015.33	A016.33	A017.33	A018.33
6,70	0,265"	A011.34	A012.34	A013.34	A014.34	A015.34	A016.34	A017.34	A018.34
6,30	¼"	A011.35	A012.35	A013.35	A014.35	A015.35	A016.35	A017.35	A018.35
5,60	3½"	A011.36	A012.36	A013.36	A014.36	A015.36	A016.36	A017.36	A018.36
5,00		A011.37	A012.37	A013.37	A014.37	A015.37	A016.37	A017.37	A018.37
4,75	4	A011.38	A012.38	A013.38	A014.38	A015.38	A016.38	A017.38	A018.38
4,50		A011.39	A012.39	A013.39	A014.39	A015.39	A016.39	A017.39	A018.39
4,00	5	A011.40	A012.40	A01340	A014.40	A015.40	A016.40	A017.40	A018.40
RECEIVER		A021	A022	A023	A024	A025	A026	A027	A028
LID		A031	A032	A033	A03C	A035	A036	A037	A038



Pan and lid for wet sieving. Made entirely of stainless steel with a water inlet at the top and a drain at the bottom.

A040 Pan and lid Ø200 mm
A042 Pan and lid Ø300 mm.

A045 Sieve for wet sieving of fine materials, Manufactured entirely of stainless steel ring Ø200 x 200 mm high mesh UNE 0.075 mm (ASTM No. 200).

A046 Sieve for wet sieving of fine materials, made entirely of stainless steel ring Ø200 x 100 mm high mesh UNE 0.075 mm (ASTM No. 200).

A048 Brass bristle brush

A048.01 Double ended, brass and nylon bristle
A048.02 Bristle Round Brush Ø30 mm.

Digital ultrasonic cleaning baths
Completely transistorized built in high frequency electric generator. Working frequency 35 Khz. Temperature regulation by microprocessor with digital read out (from ambient +5º C to 90º C). Timer 0 - 99 minutes. Cleaning tray made of stainless steel 18/10. External case made of stainless steel AISI-316. Heating by semi-detached elements at the tray. Complete-half wave selector. It allows less power consume in some applications. Draining tap incorporated.

A049 Digital ultrasonic cleaning baths, 5,7 l. capacity
Dimensions int.: 150 x 300 x 150 mm (HxWxD)
A049.05 Digital ultrasonic cleaning baths, 12 l. capacity
Dimensions int.: 150 x 300 x 240 mm (HxWxD)
A049.10 Digital ultrasonic cleaning baths, 18 l. capacity
Dimensions int.: 200 x 330 x 300 mm (HxWxD)

SAMPLE PREPARATION TRAY

Galvanized Sheet	Stainless Steel	Dimensions
A051	A061	200x200x50 mm
A052	A062	400x200x50 mm
A053	A063	400x400x50 mm
A054	A064	600x400x50 mm
A055	A065	600x600x50 mm
A056	A066	1000x1000x50 mm

SIEVE SHAKER MOTOR OPERATED

UNE EN 932-5 / ISO 3310-1

A070 The analytic **sieve shaker** is designed to obtain reproducible results in accordance with the standard ISO 9001 for measuring and control equipment. It is an essential device for research laboratorios and for quality assessment of any type of industries during the analysis of the production process. It allows to define mechanic characteristics of particles, concentration by joining forces, miscibility, perfomance with regard to stress, organoleptic characteristics, etc.

Features

- Capacity up to 6 Kg of sample.
- Three-dimensional movement.
- It can fit wet and dry sieves.
- It is controlled by a microprocessor.

User friendliness

- Standard lock system easy to program provided with the sieve.
- Adjustment of the sieve power (100% corresponds to 6400 RPM). This allows better spread of the sample through the sieve and better efficiency in the sieve process.
- It is programmable up to 16 memories. Time can be adjusted from 10 seconds to 99 minutes and hold position.
- Adjustable by intervals from 1 to 99 seconds.

Power supply: 220V, 50 Hz
Dimensions: 280x370x765 mm (W x I x h)
Weight: 15 kg

A071 Electromagnetic sieves shakers for Ø200 and 203 mm (8 "). Suitable for sieving fine material. The separate digital control panel can adjust:, power control, intermittent and sieving time from 1 to 999 minutes. The team also allows testing of wet sieving.
Sieve clamping system using threaded rod and steel lid.
Power supply: 220V, 50 Hz I ph
Dimensions: 320x380x850 mm
Weight: 40 kg

UNE EN 932-5

A073 Electromagnetic sieves shakers for Ø200, 203 (8 "), 250, 300, 315 (12"). Suitable for sieving fine material. The separate digital control panel can adjust:, power control, intermittent and sieving time from 1 to 999 minutes. The team also allows testing of wet sieving.
Sieve clamping system using threaded rod and steel lid.
Power supply: 220V, 50 Hz I ph
Dimensions: 380x440x1075 mm
Weight: 65 Kg

A075 Electromagnetic sieves shakers for Ø200, 203 (8 "), 250, 300, 315 (12"), 350, 400, 450 (18 "). Suitable for sieving fine material. Digital control module with triple vibrating action: vertical, lateral and rotational. regulation Microprocessor control with function sieving time between 0 and 999 minutes, adjusting the intensity of vibration (continuous or intermittent). The team also allows testing of wet sieving. The control module separated from the body of the machine to avoid splashing. Sieve clamping system using threaded rod and steel lid.
Power supply: 220V, 50 Hz I ph
Dimensions: 480x500x1150 mm
Weight: 85 Kg

HIGH CAPACITY SIEVE SHAKER

A077 Equipment classification and screening test samples such as rocks, gravel, slag, ores, sand and similar materials. The sieve has a capacity of six sieves and dust pan. Each screen may contain a sample to 30 liters.
Supplied complete **without** sieves (must be ordered separately).
Power supply: 230V, 50Hz 750W
Dimensions: 580X790X850 mm.
Weight: 185 kg approx.

SIEVES:

Code	Aperture	code	Aperture	Code	Aperture
A077.01	4”	A077.10	3/8”	A077.19	Nº 30
A077.02	3½”	A077.11	7/16”	A077.20	Nº 40
A077.03	3”	A077.12	5/16”	A077.21	Nº 50
A077.04	2½”	A077.13	¼”	A077.22	Nº 60
A077.05	2”	A077.14	Nº 4	A077.23	Nº 80
A077.06	1½”	A077.15	Nº 8	A077.24	Nº 100
A077.07	1”	A077.16	Nº 10	A077.25	Nº 140
A077.08	¼”	A077.17	Nº 16	A077.26	Nº 200
A077.09	½”	A077.18	Nº 20	A077.27	Fondo

ACCESSORIES:

A077.30 Safety doors, upper and frontal, complete with micro-switch, complying to CE Safety Directive.
A078 Securtiy cabinet, steel made with microswiche, complying to CE Safety Directive

AIR JET SIEVING MACHINE
UNE EN 933-10

A076 Apparatus for dry sieving of powders or granules is applied in obtaining granulometric curves between 5 to 4000 microns. The reliability and repeatability of the results, make a basic piece of equipment in the quality control of products in dust. The process is based on the application of a sweep of air entrains the fine particles to make them pass through a sieve. This effect is achieved by a vacuum that causes a depression controlled via the vacuum connection port.
Measuring range of 5 to 10 (depending on product) to 4000 microns
Vacuum regulator.
Integrated electronic control. Digital display of vacuum programmable from 0 to 99 mbar
Stop function, and OFF
Interior polished stainless steel AISI 304
Engine 20 r.p.m. 14.7 W 220V 50 Hz, IP 52.
Vacuum: up to 65 mbar
Weight: 20 kg
(Aspirator Optional) available 1200W and 2400W
Power supply: 220V, 50 Hz
Supplied with connection cable, nylon hammer, plastic cover and vacuum tube connection.

ACCESSORIES:
A076.01 Aspirator device
A076.03 Sieve Ø200 mm, mesh size UNE 0.020 mm
A076.04 Sieve Ø200 mm, mesh size UNE 0.032 mm
A076.05 Sieve Ø200 mm, mesh size UNE 0.036 mm
A076.06 Sieve Ø200 mm, mesh size UNE 0.038 mm
A076.07 Sieve Ø200 mm, mesh size UNE 0,040 mm
A076.08 Sieve Ø200 mm, mesh size UNE 0,063 mm

DETERMINATION OF PARTICLE DENSITY AND WATER ABSORPTION OF AGRREGATES

A079 Basket Ø200x200 mmh of to handle and 3.35 mm mesh
V434 Hydrostatic weighing table for manual lifting device and support for the placement of Cuba.

A080 Pycnometer 1000 ml with capillary
A081 Pycnometer 500 ml with capillary

FLAKINESS INDEX BS 812

Determination of the particle shape

A082 Series consists of seven sieves built in furnace painted plate with slots sized according to the following table:

Code	Slot width x length
A082.01	4,9x30
A082.02	7,2x40
A082.03	10,2x50
A082.04	14,4x60
A082.05	19,7x80
A082.06	26,3x90
A082.07	33,9x100

BAR SIEVES FOR DETERMINATION OF AGGREGATE FLAKINESS INDEX EN 933-3/ NF P18-561

A083 Consisting of a series of 13 SIEVES made of steel powder coated. Dimensions sieve of 280x280 mm openings cylindrical bars according to the following table:

Code	Size Fraction	Slot Width mm
A083.01	63/80	40 ± 0,3
A083.02	50/63	31,5 ± 0,3
A083.03	40/50	25 ± 0,2
A083.04	31,5/40	20 ± 0,2
A083.05	25/31,5	16 ± 0,2
A083.06	20/25	12,5 ± 0,2
A083.07	16/20	10 ± 0,1
A083.08	12,5/16	8 ± 0,1
A083.09	10/12,5	6,3 ± 0,1
A083.10	8/10	5 ± 0,1
A083.11	6,3/8	4 ± 0,1
A083.12	5/6,3	3,15 ± 0,1
A083.13	4/5	2,5 ± 0,1
A084	Fondo	

BALLAST TEST

Sieves 490x380 mm rectangular ballast. Made of steel painted in two models: bar and square mesh with the following lights:

Bars

Code	Aperture
A085	25 mm
A086	16 mm
A087	12,5 mm
A088	8 mm
A089	Fondo

Square Mesh

Code	Aperture
A094	80 mm
A095	63 mm
A096	50 mm
A097	40 mm
A098	31,5 mm
A099	22,4 mm

A100 Mobile workforce with two bearings, needle for testing and slab elements

CLASSIFICATION OF SAMPLES

UNE EN 932-1 / 933-2 / 933-3 / ASTM C136 / NF P18-553 / BS 1377 / BS812:1

Sample splitters (Riffle Boxes) for classifying samples into representative portions through chutes of different sizes. They are made of sheet steel powder coated. Comes with three receivers with handles and catcher (from ¼ "to 1 ½") and rest without catcher

Code	Slot Width	Slot Number
S001	¼" - 6,3 mm	14
S002	½" – 12,5 mm	14
S003	¾" – 19,1 mm	16
S004	1" – 25,4 mm	14
S005	1½" – 38,1 mm	12
S006	2" – 50,8 mm	10
S007	3" – 76,2 mm	8

S010 Large capacity sample splitter
Designed for the reduction of test samples which are too large in volume to be conveniently handled. It handles any material from sand sizes up to dia. 108 mm. Each chute bar is 12 mm wide so that openings of 12-24-36-48-60-72-84-96-108 mm are possible. Complete with two collecting pans. Clam shell hopper: 30 litres capacity. Very sturdily constructed, it is totally cadmium plated for rust protection.
Weight: 55 Kg

V8212/30 Porcelain mortar Ø125 mm
V8212/31 Hand Mortar with rubber head

V425 Lona to expand samples. Size 2x2 m.

BULK DENSITY OF AGGTEGATES
EN 1097-3 / ASTM C29÷97 / BS 812 / ISO 6872

Manufactured in stainless and painted thick
A115 Metal container with handles 1 dm ³
A116 Metal container with handles 5 dm ³
A117 Metal container with handles 10 dm ³
A118 Metal container with handles 20 dm ³
C001.02 Steel rod Ø16 x 600 mm

SPECIFIC GRAVITY OF AGGREGATES
UNE 103.302, ASTM D854, BS 8122, 1377

V5572 Renault pycnometer cup solid peak of 50 ml.
V5573 Renault pycnometer cup solid peak of 100 ml.
V5562 Gay-Lussac pycnometer of 50 ml liquid.
V6361 Calibrated flask 100 ml.

FINE AGGREGATE SURFACE MOISTURE
ASTM C70 / AASHTO T142

A125 Chapman bottle to determine the surface moisture in fine aggregates. Graduated up to 200 ml between two appraisals and from 375 to 450 ml capacity above the second.
Weight: 510 g.

A125.01 Enclosure for bottle chapman
V9245 Maximum and minimum thermometer with canopy

Hammer grinding mill, for laboratory

A127 Used to mill small quantities of product for laboratory testing.
Feeding is via vertical input which allows products with a particle size of max. 15 mm
Quick release door with safety micro sensor which is activated when the rotor and blades are in operation.
It comprises a three long-lasting blades manufactured from stainless steel and an interchangeable screen with round perforations from 1 to 5 mm diameter.
Frontal and loading hopper manufactured from mirror-polished AISI-304 stainless steel.
- Grinding chamber dia. 110 mm - 3 fixed hammers
- Output particle size: various opening size 1, 2, 3, 4 and 5 mm(one screen included)
- Max. hardness of the material to grind: 6 Mohs
- Chamber volume: 0,5 l
- Speed: 3000 rpm
- Power supply: 230V 1ph 50/60Hz 1,1kW
- Dimensions: 520 x 230 xh 420 mm
- Weight: 25 kg

DETERMINATION OF VOIDS IN THE FILLER
EN 1097-4 / BS 812

A128 Equipment for compacting the filler, base manufactory of 100 x 150 mm with two guide columns, Ø25 mm internal cylinder and a piston penetration graduated that slides cylinder freely without friction side.
Weight: 4 kg

Accessories:

A128.01 Pack of 100 filters Ø25 mm.

DETERMINATION OF DRYING SHRINKAGE
EN 1367-4 / BS 812:102

A130 Triple mould 50x50x200 mm with holes for the placement of the contact tip

A130.01 Point of contact for previous mold. Supplied in pack of 15 pieces.

A130.03 Invar bar reference for calibrating the gap

CONTRACTION METER
Determination of drying shrinkage
Test thermal properties and wear aggregates
EN 1367-4 / BS 812:102

A133 Equipment used for measuring variations in length of the specimen. The top bridge can be adjusted to suit the length of the specimens.
It also measures the linear shrinkage of samples having different dimensions.
as: 40x40x160 mm, 1 "x 1" x 1 "¼.
Supplied without meter and the reference bar (see accessories).

Accessories:

A133.01 Digital comparator 5 mm x 0.001 mm div.

A133.02 Digital comparator 12.5 mm x 0.001 mm div.

A133.03 Invar bar reference for calibrating the gap

FLAKINESS AND THICKNESS GAUGE INDEX
BS 812

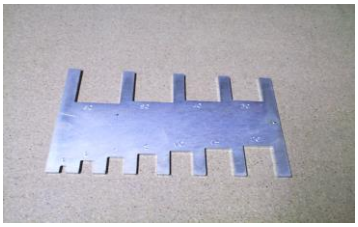
A134 Length gauge to measure flakiness index of aggregates.

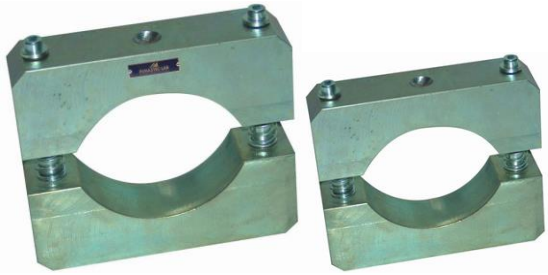
A135 aggregates

SHAPE COEFFICIENT
EN 933-4, 933-5 / DIN 4226 / CNR N.95

A136 Gauge for determining the coefficient form of coarse aggregate

A137 Shape gauge for measuring the length and thickness of aggregates for concrete.





UNE 22950/2

A138 Device for indirect (Brazilian) tensile strength in rock samples used in testing machines of Inmastec multiensayo
Applicable Ø90 mm specimens.
Displacement: 30 mm.

A139 Device for indirect (Brazilian) tensile strength in rock samples used in testing machines of Inmastec multiensayo
Applicable Ø70 mm specimens.
Displacement: 30 mm.

POTENTIAL REACTIVITY OF AGGREGATES TO ALKALI FRONT CEMENT
UNE 146.507 / UNE 146.507-1 / EN 96 / ASTM C289

A140 Container for determining the reactivity potential chemical of aggregates in contact with alkalis of cement. Manufactory of stainless steel with sealing cover.
Capacity: 59 cm ^{3}

CONSISTENCY OF AGGREGATES
EN 1367-2 / ASTM C86

A141 Metal basket Ø120x160 mm, 3.35 mm mesh with handle
A142 Metal basket Ø95x120 mm, mesh size 1.18 mm with handle
A143 Metal basket Ø95x120 mm, 0.60 mm mesh with handle
A144 Metal basket Ø95x120 mm, 0.50 mm mesh with handle
A145 Metal basket Ø65x80 mm, 0.15 mm mesh with handle

DETERMINING PARTICLE DENSITY AND WATER ABSORPTION
EN 1097-6 / ASTM C128, C127 / AASHTO T84 / BS 812 / DIN 12039

A146 Det conical mold, funnel and ram to determine relative density and fine aggregate absorption.
A147 1000 ml pycnometer with plug, capillary tube and funnel.
A148 500 ml pycnometer with plug, capillary tube and funnel.
V5236 Volumetric flask of 500 ml capacity

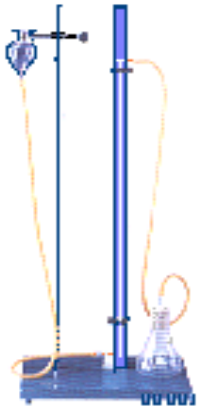
DETERMINATION OF RELATIVE DENSITY OF COARSE AGGREGATE
UNE EN 1097-6

A150 Metal basket Ø200 x 200 mm with handle, for coarse aggregate sizes less than 38 mm.
A151 Metal basket Ø250 x 250 mm with handle, for coarse aggregate sizes above 38 mm.

TEST METHLENE BLUE
For measuring the capacity of methylene blue absorption by sand fines.
EN 933-9 / NF P94-068 / NF P18-592
A152 Electronic Shaker fins, with digital display. Speed range between 200-2000 rpm. Supplied complete with stirring paddle, support and fixing chuck
A153 Electronic mixer with digital speed display, speed range 40-400 and 200-2000 rpm Accessories not included.
A153.01 Support dual T, stainless steel rod. AISI 304 Ø20 x 800 mm.
A153.02 Double blades cross.
A152.02 Box of 100 filter paper Ø 125 mm.
A152.03 Box of 100 gr. Methylene Blue.
A152.04 Box of 25 gr. Methylene Blue.
V7557 Burette 50 ml graduated with key.
V7558 Burette 100 ml graduated with key.
A152.05 Double locking nut
A152.06 Solid glass rod 300 mm length
A152.07 Base plate Support


A152


A153



Carbonate content in aggregates
UNE 103.200
A154 Bernard calcimeter to determine the carbonate content in soils and aggregates. By adding hydrochloric acid to the sample, the carbonate present therein is released in the form of C02. C02 liberated as a result of pressure increases, and this increases the level of the burette water deaeration. The measured level difference indicates the amount of C02 released, allowing the calculation of the carbonate content
Supplied with metal support, 100 ml burette, level glass ampoule, 250 ml Erlenmeyer flask., Glass test tubes, and latex rubber tube metal clamp nut.

DETERMINATION CLAYS, SILTS, DUST IN THE AGGREGATE
EN 933-9 / ASTM C117 / BS 812, NF P94-068
A155 Orbital and reciprocating
- Orbital or reciprocating motion modifiable
- Shaking tray is designed to couple various laboratory containers and is provided with four metal bars to fix padded in various ways such containers.
- Among its highlights technical specifications:
  -Stirring speed, adjustable from 40 to 350 rpm
  -Clock timer. Selectable up to 60 minutes,
  -Tray 500x400 Mm agitation.
  With digital-to an accuracy of ± 2%.
- Warning lamp operation.
- Manufactured under CE
- Voltage: 230v/50Hz

COEFFICIENT DETERMINATION OF LOS ANGELES
EN-1097-2 / EN 12697-17 / EN 12697-43 / ASTM C131
A158 Machine Los Angeles

Used to determine the resistance of aggregates to abrasion. It comprises a heavy steel cylinder of 711 mm inside diameter x 508 mm inside length, mounted on a base frame. The cylinder rotates at 31÷33 rpm.
The machine is fitted with an automatic digital counter which can be preset to the required number of revolutions of the drum.
The cylinder is counterbalanced so that the filling opening stays in position whithout tilting; a push-button allows to position such opening for the loading/unloading operations.
Supplied **"without"** abrasive charges to be ordered separately according to the Standards the machine has to comply. It cannot be sold in the CE markets without protection (see accessories).
Power supply: 230 V 50 Hz 1ph 750W
Dimensions: 1000x800x1000 mm
Weight: 370 Kg

A158.01 Set of 11 abrasive charges(between 4690 and 4860 ± 20 gr.)
A158.02 Set of 12 abrasive charges (between 5120 and 5300 ± 20 gr.)
A158.03 Security cabinet, manufactured from sheet steel, conforming to CE Safety Directive.
When opening the cabinet's door during Los Angeles working, a microswitch automatically stops the rotation of the drum.
Dimensions: 1100x1180x1250 mm
Weight: 150 kg approx..

CONSISTENCY OF AGGREGATES
UNE-7134 / ASTM C235

A159 Sclerometer of soft particles,
Equipment determines the soft particles in coarse aggregate.
It consists of a movable cylinder 1 kg of weight freefall and a needle of 1.6 mm Ø with round head.

A159.01 Cuzin Needle Ø 1.6 mm.

IMPACT RESISTANCEBS 812 / NF P18-574

A160 Apparatus for testing the impact strength of the aggregates according to BS 812. Sturdy steel protected against corrosion, has an automatic counter of the number of hits. Comes complete with cylindrical measure ø 76 x 52 mm deep and compacting rod ø 9.5 x 300 mm in length.
Dimensions: 442 x 320 x 930 mm.
Weight: 58 kg. About

Accessories:

A160.01 Compacting rod Ø95x300 mm
A160.02 Measurement cylindrical Ø6x52 mm

A161 Apparatus for testing the impact resistance of aggregates according to the NF P 18-574, robust steel corrosion protection with automatic counting of the number of hits. Supplied complete with cylindrical measure ø 102 x 52 mm deep and compacting rod ø 9.5 x 300 mm in length.
Dimensions: 442 x 320 x 930 mm.
Weight: 58 kg. Approx

Accessories:

A161.01 Ø102x52 mm cylindrical mesurement Standard NF 18-574

DETERMINATIÓN OF ABRASION DEEP AND CERAMIC TILE CEMENT
EN 1341 / 1342 / 1343 / 1339 / EN 10545-6 / UNE 13748-2

A162 ABRASION RESISTENCE ON NATURAL STONES AND CONCRETE TILES FOR PAVING

Used to determine the resistance to abrasion and wear of concrete products and natural stones, by measuring the length of a groove produced on the specimen surface by a disc with thickness of 70 mm that rotates at controlled speed and makes a constant pressure on the specimen.
A charge of abrasive material must be interposed between the disc and the specimen.
The instrument is supplied with aspirator to collect powders, electronic speed controller and shutting off device after the set number of revolutions, 1 Kg of abrasive material, accessories and cabinet to CE Safety Directive.
Power supply: 230 V 50 Hz 1ph 500W
Dimensions: 450x420x800 mm.
Weight: 85 Kg

A162.01 Box of 25 kg corundum grain 3
A162.02 Calibration plate made of boulonnaise marbre
A162.03 Abrasion disc Ø200 x 10 mm

CRUSH RESISTANCE
UNE 83112; BS 812:110

A163 Equipment to determine the crush resistance of the aggregates less than 9.5 mm. Supplied complete with Ø75 mm mold, mold base, compacting piston and rod.
A164 Equipment to determine the crush resistance of the aggregates less than 9.5 mm. Supplied complete with Ø150 mm mold, mold base, compacting piston and rod.

FRIABILITY COEFFICIENT
EN 1097-1 / NF P18-572, P18-576 / UNE 83115

A166 DETERMINATION OF THE RESISTANCE TO WEAR
Used to determine the resistance of aggregates by abrasion. The machine essentially comprises a heavy steel frame on which the following stainless steel cylinders can be mounted:
4 cylinders dia 200x154mm, or
2 cylinders dia 200x400mm, or
2 cylinders dia 200x154mm and 1 dia 200x400mm
The Micro-Deval is supplied complete with separate control panel fitted with a digital automatic revolutions counter.
Supplied "without" stainless steel cylinders and "without" stainless steel spheres which have to be ordered separately.
It cannot be sold in CE markets without security cabinet (A166-05)
Power supply: 230V 50Hz 1ph 750W
Dimensions: 1000x450x920mm
Weight: 150 kg approx.
A166.01 Abrasive charge of 9, 21, 259 stainless steel balls. 420, for Micro-Deval apparatus.
A166.02 Charges abrasive Ø 10 mm (5 Kg)
A166.03 Cylinder, standard, stainless steel, 200 mm dia. x 154 mm length (4 pieces are required). EN 1097-1
A166.04 Cylinder, stainless steel, 200 mm dia. x 400 mm length. Conforming to EN 13450, NF P18-572.
A166.05 Micro-Deval same to mod. A166, but equipped with security cabinet, conforming to CE Safety Directive.

A167

ACCELERATED POLISHING MACHINE OF AGGREGATES
UNE-EN 1097-8 / EN 1341/ EN 1342/ EN 1343 /
T-174; BS 812 :114

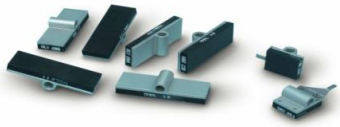
A167 DETERMINATION OF THE POLISHED STONE VALUE
It measures the resistance of road aggregates, paving stones, paving blocks, to the polishing action of vehicle tyres on a road surface.
The specimens are manufactured with suitable moulds.
The specimen is than located on the Road Wheel accepting 14 specimens.
The wheel is now rotated and enters in contact with solid rubber tyre, spring loaded.
Abrasive charges are continuously introduced by two automatic mechanical feeders (hoppers). The feeders are held by a suitable support disjoined from the machine body; this solution saveguards feeding calibration and realiability/life of the hoppers from the influence of test execution vibrations.
Road wheel speed: 310 to 330 r.p.m.
The water is supplied at a controlled rate through a water container equipped with flow regulator.
The digital control panel, foreseen in the back side of the machine, allows to select the test time.
During the test execution the display shows the remaining time and the speed rotation of the wheel holding the specimens.
The machine provides a method of preparing polished stone specimens for use with the Skid Resistance Tester mod. A113 when used in Laboratory.
The unit is supplied complete with 2 rubber wheels (one for corn and one for flour emery), set of 4 secimen moulds and 2 mould covers, while control stone, corn and flour emery have to be ordered separately (see accessories).
Power supply: 230 V 50 Hz 1ph 750W
Dimensions: 1800x820x600 mm
Weight: 175 kg.

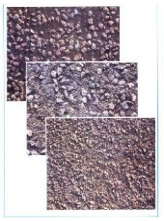
Accessories:
A167.01 Com Emery (25 Kg)
A167.02 Flour Emery, 5 kg pack
A167.03 Control Stone, ungraded (25 Kg)
A167.04 Friction Tester Reference Stone (Criggon Stone) 25 Kg bag
A167.11 Mould (without cover) to prepare the specimen
A167.12 Cove for the mould

TEST ABRASION BÖHME
EN 1338 / EN 1339 / EN 1340 / 13892-3 / 14157 / DIN 52108

A168 The instrument measures a volume loss in a specimen under abrasion test and it's used in tests such as:
Paving stones, concrete slabs, slabs made of natural rocks and natural stone slabs.The test is performed by positioning a specimen to be verified in a abrasion tester Böhme apparatus on the test track on which has been spread normalized abrasive; the grinding wheel it's made rotate and the specimen submitted to the abrasive load of 294 N for a certain number of cycles. Before doing a test, establish the specimen's bulk density by measuring weight and thickness. Perform the test for 16 cycles composed of 22 turn each, calculating at the end a worn as a average loss in volume and weight. The apparatus is basically composed of:
Cast iron horizontal disc with a speed of 30 rpm and a diameter of 750mm furnished of a 200mm test track to position a specimen.
Separate control panel with digital revolutions counter with

automatic stop after preset revolutions, specimen's holder and adjustable charger used to produce a force of 294 N ± 3 N on a specimen
Power supply: 230V 50Hz 1PH 800 W
Dimension: 1500 x 1000 xh 850 mm
Weight: 250 kg
A168.01 Abrasive material, box of 5 kg





SKID RESISTANCE COEFFICIENT
EN 1097-8/ EN 1338/ EN 1341/ EN 1342/ EN 13036-4/ EN 1436/ ASTM E303

A169 TRRL Pendulum laptop to measure skid resistance.
The equipment consists of a base with three adjustable support points and joined by a vertical, where the whole mechanism is supported test and measurement of sliding resistance. The unit is The tester is supplied "WITHOUT" rubber sliders that have to be ordered separately (see accessories).and graduated scale for measuring light alloy mounted on rubber and laboratory use.
Dimensions: 750x730x330 mm.
Weight: 32 Kg

Accessories:
A169.01 Sliding rubber for use in laboratory PSV.
A169.02 Sliding rubber for use on land.
A169.03 Large rubber (6 pcs.).
A169.04 Small rubber (6 pcs.).
A169.05 Metal base plate.

JAW CRUSHER
EN 1744-1 / UNE 83.120

A170 Equipment for crushing and reducing the size of aggregate samples, minerals and similar materials.
The crusher has an input opening measuring 80 x 50 mm, adjustment system of the size of material to 1 mm.
Container capacity 2.5 dm ^{3}.
Dimensions: 800x320x650 mm
Weight 100 Kg approx.

A171 Jaw Crusher similar to A170 model, but with input opening measuring 100 x 60 mm.

ROCK STRENGTH INDEX
ASTM D5731

A173 Used to determine the strength values of a rock specimen both in the field and in the laboratory.
It consists of a load frame for applying loads up to 55 KN, on which a manual hydraulic jack is mounted. The instrument accepts core specimens up to 4" (101,6 mm) diameter which are loaded by two coneshaped points.
A graduated scale indicates the distance between the conical points.
The applied load is measured by a **high precision electric load cell** with a digital display unit range 0-56kN proving:
- 65.000 divisions
- 0,001 kN resolution
- Linearity: 0,05%
- Hysteresis: 0,03%
- Repeatability: 0,02%

The strength index (IS) is got by the formula P : D2 where P is the strength and D the space between the two conical points. Supplied complete with wooden carrying case, goggles, accessories.
Dimensions: 400x530x720 mm. Weight: 25 kg

A175 Equipment formed by a point load rigid frame which is mounted on a framework consisting of two columns trials with adjustable upper bridge, hydraulic piston actuated by a manual pump millimeter ruler to measure the distance between two steel conical points constructed especially and a pressure gauge graduated to 400 kg / cm ²
Dimensions: 400x650x300 mm
Weight: 20 kg.

Accessories:
A175.01 Gauge of 400 Kg / cm ²
A175.02 Gauge of 100 Kg / cm ²
A175.03 Gauge of 20 Kg / cm ²
A175.04 Safety cabinet according to CE
A175.05 Set of cone-shaped points

SPCIMEN CUTTING DEVICES

C080 Cutting concrete specimens, witnesses and construction materials. It has a screw to vary the height of the head. Supplied complete with submersible pump water for cooling and blade guard.
Specifications: 3 Hp
Power supply:. 230/380V. 50 Hz
Cutter: Supports 300/350 - 25.4 mm ..
Carriage Dimension: 498 x 648 mm.
Maximum cutting length: 645/630

Accessory:
C080.01 Cutting Disc Ø350 mm
C080.02 Cutting Disc Ø300 mm

C081 High capacity cutter for highest production, cutting block, curbs and specimens. Height adjustable head. Ability to Ø 600 mm disc.
Motor: 220/380V three phase
Power: 7.5 C.V.

C081.01 Disc diameter Ø 600 mm. old concrete diamond.

ROCK CLASIFICACCIÓN
ASTM D5873 / ISRM
A180 clerometer for rock classification. The sample is placed horizontally on the stand and taken several measures at various points perpendicular to the longitudinal axis.
Impact energy: 0.74 Nm
Test Range: 10 ÷ 60 N / mm ²
Weight: 2,100 Kg approx.

A180.01 Support universal guide to test standard rock saw.

A182 Calibration Anvil for calibration to Hammers EN 12504-2 / ASTM D5873, C805
Dimensions: Ø150x230 mm
Weight: 17 kg approx.

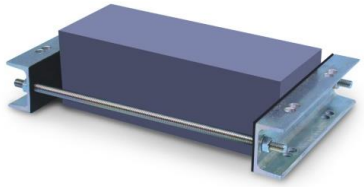
EN 101
Set of mineral Mohs hardness scale
A184 Set to identify minerals formed at its surface hardness. This consists of 10 mineral following codes: (1) Talcum, (2) Plaster, (3) Calcite, (4) Fluoride, (5) Apatite, (6) Feldspar, (7) Quartz, (8) Topaz, (9) Corundum and (10) Diamond
Weight: 500 kg approx.

SAND EQUIVALENT TEST SET (COMPLETE)
EN 933-8 / UNE 103109 / ASTM D2419 / BS 1924 / NF XP18-598
S060 Equipment to determine sand equivalent consists of the following components.
S060.01 Plexiglass measuring cylinder engraved at 2 stripes 100 and 380 mm. square basis
S060.02 Rubber stopper for cylinder
S060.03 Irrigator tube with conical tip and holes
S060.04 Measuring of 125 ml
S060.05 Funnel wide mouth
S060.06 Weighted foot assembly for sand level
S060.07 5 L container with siphon lid
S060.08 Tubo de goma (1,5 m).
S060.09 Mohr clamp
S060.10 Graduated ruler 500 mm stainless steel
V435 Stop watch, digital
S061 Miniature sample splitters 5 mm with three receivers
S062 Concentrated stock solution, 5000 ml.

S063 Motorized sand equivalent shaker
The unit provides a constant uniform shaking with automatic cycle test. Oscillating excursion is 203 mm at 175÷180 adjustable strokes/min. rate. Complete with digital timer that automatically stops the shaker at the end of the test. It cannot be sold in CE markets without security cabinet
Power supply: 230V 1ph 50 Hz 250 W
Dimensions: 700x360x350 mm. Weight: 30 Kg

C083

C083.01



C083.04

C083.03 Set mounting brackets diameter specimens 100, 110, 150, 160 mm. can only be used in conjunction with C083.02

C083.04 Mounting set for different sized blocks to 390x250 mm.

SPECIMEN GRINDING MACHINE
EN 12390-3/ ASTM D4543

C083 Specimens automatic grinding**,** designed to grind and polish concrete cube and cylinder specimens, blocks, natural stones, rocks, ceramic materials etc. The specimens are easily fixed to the table by proper locking stirrups (see accessories) allowing to grind at a time:

- N° 3 cube specimens 100mm side, or
- N° 3 cube specimens 150mm side, or
- N° 2 cube specimens 200mm side, or
- N° 2 cylinder specimens dia. 100x200, 110x220, 150x300, 160x320mm, or
- N° 1 block with max. dimensions 390x250mm

The revolving abrasive head is radially and alternatively moved in both directions through an electric motor actuated by a pushbutton.
The column is completely protected against the abrasive dust.
The vertical lowering of the grinding head is achieved with infinitesimal adjustments by operating on the top handwheel having 0,05mm graduations.
The machine, made from rugged plate, is supplied complete with control panel, coolant/decantation tank (by water and emulsifying oil), motor pump, set of abrasive sectors, safety chip guard that when removed, stops automatically the machine.
The standard supply "**does not include**":

- The locking stirrups,
- The diamond sectors (8 pieces)

that must be ordered separately (see accessories).

Technical specifications:
Table dimensions: 775x280mm (useful: 750x235mm)
Grinding wheel dia.: 330mm
Vertical span width: min. 175mm (95mm with the distance piece) max. 380mm
Grinding height range: 95 ÷ 380mm
Grinding head stroke: 215mm
Grinding wheel speed: 1400 rpm.
Power supply: 400V 3ph 50Hz 4500W
Dimensions: 1220x1080x (h) 1730mm
Weight: 410 kg approx.

Accessories:
C083.01 Diamond polishing sections (8 units required), especially effective due to their long working life and good grinding action.
C083.02 Set cubic specimen mounting brackets 100, 150, 200 mm.

Drying oven with forced air circulation, Adjustable temperature from 40 ° C to 250 ° C. Temperature homogeneity: ± 2%
Safety according to EN 61010-1, EN-61010-2-010
Outdoor furniture built in oven painted with epoxy. Inside tray, double body and counter stainless steel AISI 304. Silicone gasket. Adjustable aerator
Regulating Hydraulic thermostat temperature. Analog thermometer, the internal temperature reader, electric resistance heating chamber mounted independently, which allows optimum temperature stability.
Device complete with two stainless steel perforated trays.

Code	Capacity	Internal measures within mm. H x W x D	Exterior measurements in mm. H x W x D	Power W
V400	43	330 x 470 x 280	520 x 790 x 470	1.000
V401	78	500 x 450 x 350	810 x 640 x 550	1.000
V402	135	500 x 600 x 450	690 x 920 x 640	1.000
V403	250	800 x 600 x 520	1100 x 750 x 760	3.000

HOEK CELLS FOR ROCK TRIAXIAL TEST
ASTM D5873

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.

A187 Hoek AX Triaxial Cell measuring Ø 30.10 x 60 mm.
A188 Hoek cell measuring 1.5" Ø 38.10 x 75 mm.
A189 Hoek BX cell measuring Ø 42.04 x 85 mm.
A190 Hoek NX cell measuring Ø 54.74 x 100 mm.

Accessories:
Plates to distribute the load and prevent cell damage piston compression plates of the press.
A187.01 Load distribution plate for AX Cell
A188.01 Load distribution plate for Cell 1.5 "
A189.01 Load distribution plate for BX Cell
A190.01 Load distribution plate for NX Cell

Parts:
A187.02 Set of pistons for AX cell
A188.02 Set of pistons for 1.5 "cell
A189.02 Set of pistons for BX cell
A190.02 Set of pistons for NX cell

A187.03 Rubber sleeve for AX cell
A188.03 Rubber sleeve for 1.5 "cell
A189.03 Rubber sleeve for BX cell
A190.03 Rubber sleeve for NX cell

NOTE: The load spreaders A187.01 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.

HORIZONTAL EXTRUDER HOEK SPECIMENS

A192 Equipment used to eject the rock sample from the rubber jacket, avoiding emptying the confining fluid. Supplied **"without"** adaptors to be ordered separately (see table).

Weight: 12 Kg

A192.01 Set of adapters to remove AX samples Ø 30.10 x 60 mm.
A192.02 Set of adapters to remove 1.5" samples 1.5, Ø38.10 x 75 mm.
A192.03 Set of adapters to remove BX samples Ø 42.04 x 85 mm.
A192.04 Set of adapters to remove NX samples Ø 54.74 x 100 mm.

HYDRAULIC CONSTANT ISOTROPIC CELL PRESSURE SYSTEM

A193 The unit consists of a hand operated pump, complete with precision pressure gauge supplying pressures up to 35 MPa, complete with reservoir and connections, providing all round pressure source to the Hoek Cell.
Weight: 18 Kg

Accessories:
A193.01 Pressure maintainer. Supplied complete with pump, to allow a costant load to be maintained during the test.

A196

A196 This unit provides an infinitely variable constant pressure from o to 3500 kPa by using a motorized hydraulic pump, an oil/water interchange vessel, piston/spring, valves, and high viscosity oil.
Supplied complete with test pressure precision gauge, range 0-3500 KPa.

Power supply: 230V 1ph 50 Hz
Dimensions: 320x320x410 mm
Weight: 20 Kg

PRMEABILITY OF ROCK WITH HOEK CELLS

Equipment for measuring the permeability or flow of water through a rock specimen with a controlled water pressre 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.

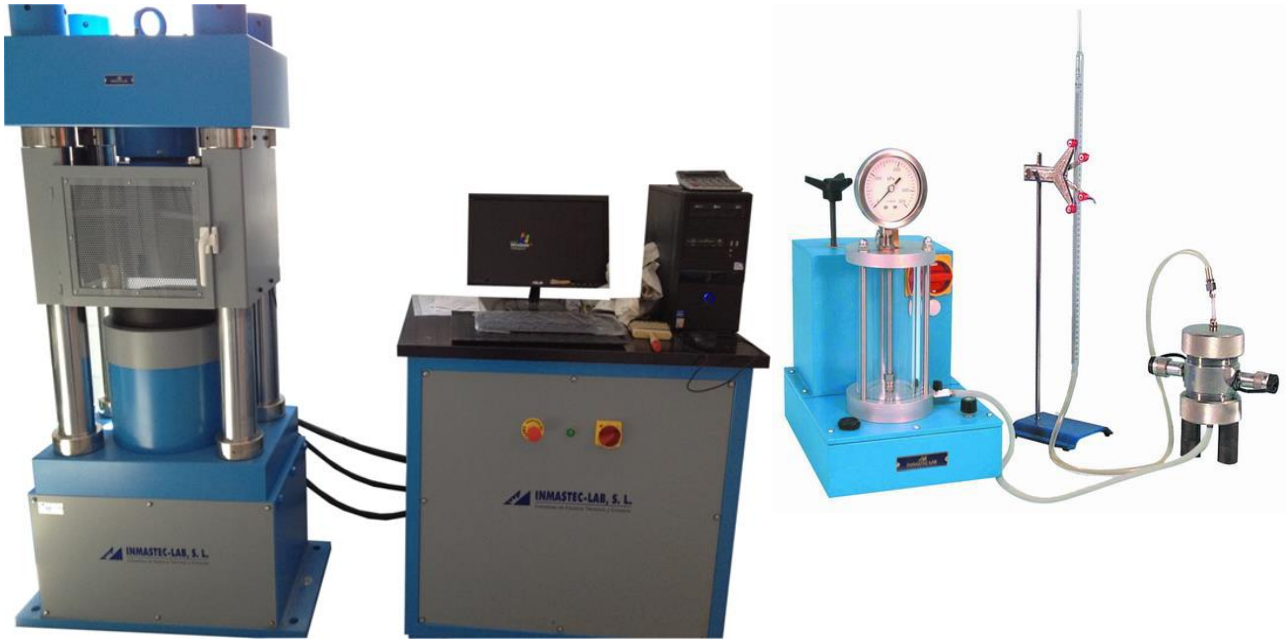
MODELS:
A187.05 Samples measuring Ø 30.10 mm.
A189.05 Samples measuring Ø 42.04 mm.
A190.05 Samples measuring Ø 54.74 mm.

A200 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..

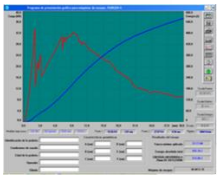
Accessories:
A195 Nylon tube (25 m).

"Speedy" Moisture Testers
BS 6576 / ASTM D4944

A200 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. Capacity 6 g. Complete with electronic balance, reagent tin, accessories the whole contained in a portable moulded case.
Moisture range: 0-20%
Weight: Kg.
A201 Speedy moisture tester 20 grams capacity. Range: 0-20%
A200.01 Carbide Amploules (Pack of 100)



The presses that can be used for testing: Press 2000 to 3000 KN KN servo (see section concrete) or electro-mechanical press multitester of 200 KN to 300 KN (see section soils)



Equipment required for testing:
Strain gauge, acquisition module with 16 signal conditioners, calculation software elastic modulus and computer

UNIAXIAL TEST STRAIN GAGES
ASTM D2664 / D5407 / D3148 / D2938 / ISRM
The test consists of determining the stress-strain curves, the elastic modulus (Young) and Poisson's coefficient in single axis compression of a regular cylindrical specimen. The gage should be chosen according to the size of the grain of the rock must be pasted neatly into the specimen, since the installation is very important in the test results. They put four bands in each sample, two for axial strain and two for diametral deformation. It is desirable to obtain a good result, install each band Wheatstone bridge,. Data acquisition transmitted by bands through a conditioner, is collected by the software automatically on your computer, which gives order to begin the test cycles are controlled, making the data displayed in real time while running all data.

C117 Compression testing machine 3000 KN with computer control (see section of concrete)
C111 Compression testing machine 2000 KN with computer control **(**see section of concrete**)**
S156 Universal Electromechanical frame 300 KN (see section soils)
S155 Universal Electromechanical frame 200 KN (see section soils)
S086 Data acquisition with capacity for 16 conditioners
C125 Extensometric bands with 60 mm base length.
C126 Extensometric bands with 30 mm base length.
C127 Extensometric bands with 20 mm base length.
C128 Extensometric bands with 10 mm base length.
V430 Compatible PC
E603 Elasticity software.

GROUP I&S

Bitumens

GROUP I&S

GROUP I&S

CONTINUOUS FLOW CENTRIFUGAL EXTRACTOR
UNE EN 12697-1 / 12697-14 / EN 13108 / ASTM D1856 / BS 598

B001 Centrifugal extractor 5000 gr continuous flow capacity without filter to determine the content of filler in bituminous binders. Manufactured steel outer body casting. It has four strong legs for settlement on soil and absorb vibrations caused by the load. The control panel has the on-off switch, emergency brake and zeta.
The machine is supplied complete with lockable metering hopper, two stainless steel conical sieve UNE 0.100 and 0.063 mm. and bucket 5 l. capacity.
Rotational Speed: 3500 rpm
Container capacity: 500 g. retention.
Power: 380 V. 50 Hz

Accessories:
B001.01 Sieve tapered stainless steel UNE 1.00 mm.
B001.02 Sieve tapered stainless steel UNE 0,063 mm.
B001.03 Bucket 5 l. capacity stainless steel.

HOT REFLUX EXTRACTORS
UNE EN 12697-1 / EN 13108 / DIN 1996

B002 Extractor heated to reflux in 5000 g capacity to determine the content of bitumen in asphalt mixtures for calculating the weight difference of aggregates.
The team consists of a cylindrical stainless steel basket stainless steel mesh of 3 mm. and a cover with water condenser inlet and outlet water.
Dimensions Ø 180 x 380 mm.
Weight: 6 kg approx.

Accessories:
B002.01 Basket with stainless steel mesh
B002.02 Hotplate Ø 150 mm. and 1000 W. power.

CONTINUOUS FLOW FILTERLESS CENTRIFUGE
EN 12697-1 all. B.2.1, EN 13108 / DIN 1996 CNR N° 38 / ASTM D1856

B003 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 2 mm and 0,063 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: 230 V 1ph 50 Hz 600 W
Dimensions: 350x600x720 mm.

SPARE:
B003-01 Aluminium beaker Ø70 x 200 mm high

SOLVENT RECOVERY STILL 10 L/HOUR

B004 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 very high quality (AISI 316) made.
Supplied complete of funnel/tank with sieve insert, 10 m plastic tube.
Power supply: 230 V 1 ph 50-60 Hz 1300 W
Dimensions: 320x400x650 mm
Weight: 17 kg

BITUMINOUS BINDERS. DETERMINATION OF THE RESISTANCE OF HARDENING. ROTATING FLASK TEST: RFT METHOD. UNE EN 12697-3 / 12697-1

B005 This unit is used to evaluate the hardening effect of a treated bituminous binder sample. The test is performed by introducing 100 g of bituminous binder into the rotating flask. The sample is heated at 165°C and ambient temperature air is blowed into the flask containing the binder hardening the same. The hardening effect is evaluated by penetration, viscosity and softening point tests.
The Rotary Evaporation Apparatus is essentially composed by:
- Distillation flask 1000 ml capacity.
- Motor of variable speed, suitable to rotate the flask at an adjustable rate of 20 to 270 rpm.
- Condenser.
- Solvent recovery flask, 1000 ml capacity.
- Heated oil bath.

The angle of the rotary/distillation flask is 15° approx.
The instrument is supplied complete with glass tubing with three way valve and transparent flexible hose for solution intake.
.

The Rotatory Apparatus requires a vacuum pump and a vacuum regulating system (see accessories).
Power supply: 230V 1ph 50Hz
Weight: 27 kg approx

DETERMINATION OF THE AFFINITY BETWEEN AGGREGATES AND BITUMEN UNE EN 12697-11 / EN 13108

B007 Bottle rolling machine with rotation speed adjustable from 0 up to 85 rpm, used for the determination of the affinity between aggregate and bitumen, expressed by visual registration of the degree of bitumen coverage on uncompacted bitumen-coated mineral aggregate particles afther influence of mechanical stirring action in the presence of water. The machine can roll up to 3 bottles at the same time. Supplied complete with timer range 0 – 6 hours.
Power Supply: 230V, 50 Hz
Dimensions: 385x294x162 mm
Weight: 11 kg approx.

B007.01 Test bottle, made of borosilicate glass, 500 ml capacity, diameter 86 mm, height 176 mm, neck with diameter opening 34 mm, as expressly requested by EN Specification.
B007.02 Glass rod with a diameter of 6 mm equipped with 35 mm long fitting rubber tube.


B011/B009


B009/B009.01 B009.02/B009.03 B010


B010

VACUUM PYKNOMETER 10 LITROS CAPACITY THEORETICAL MAXIMUM SPECIFIC GRAVITY OF UNCOMPACTED BITUMINOUS PAVING MIXTURES (RICE-TEST)

UNE EN 12697-5, 12697-12 / EN 13108 /ASTM D2041

B009 Transparent plexiglass made, 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.
To perform the test a minimum ultimate vacuum of 30 mm/Hg is requested.
Dimensions: 300 mm dia. x 450 mm high Weight : 8 kg approx.

Accessories:

B011 Vibro-Deaerator electromagnetic, with adjustable vibrating intensity. To vibrate the pycnometer for the evacuation of the air this unit can be used also as a Sieve Shaker.
Technical details: see section Aggregates, pag. 14
B009.01 Analogue pressure gauge
B009.02 Dewar vessel plate 1500 ml capacity, flat base
B009.03 Condensation trap 175 mm length
B009.04 Special pycnometer (Flask) 1000 ml capacity of 135 mm. cap and hook height according standard EN 12697-5
B009.05 Special pycnometer (Flask) 500 ml capacity of 130 mm. cap and hook height according standard EN 12697-5
V6204 Disk Ø290 mm porcelain with holes placed in the bottom of container 10 l.

B010 Portable vacuum pump with vacumetro and digital timer and magnetic induction ventilated motor, silent, vibration or oil contamination when working in dry membrane. Vacumetro controller and digital timer to preset test time.
Vacuum: 750 mm Hg
Pressure: 13 mbar
Flow: 12 l / min.
Dimensions: 260x310x130 mm
Power supply: 230 V, 50 Hz
Weight: 6,100 g.

Accessories:

B010.02 Connecting pipe to bind the vacuum pump pycnometer


B009.04/05 B009.02 B009.03

NON NUCLEAR ELECTROMAGNETIC DENSITY GAUGE, INFRARED TEMPERATURE SENSOR

B012 The Electromagnetic Density Gauge is a non nuclear sensing device that allows field density real time measurement of asphalt.
This technically advanced instrument for quality control allow operators to immediately identify spots with low pavement density and trigger corrective actions leading to more uniform pavements.
The Electromagnetic densimeter allows:
- Pavement tests.
- Real time measurements, in a continous mode.
- LCD visualization of:
• Average density.
• % Maximum density.
• % Air voids.
- Non Nuclear device, so maximum safety for operator
- Storing up to 999 measurement data records and RS-232 computer interface.
- Infrared sensor for an accurate measurement of the road surface (optional).
- Rechargeable batteries for 32h continous usage.
- Charging supply for standard 230V/50Hz or 12Vcc.

Dimensions: 229x406x152 mm.
Weight: 5 kg

Accessories:
B014.01 Cage for incinerating the simple
B014.02 Heat resistant gloves
B014.03 Thermal printing paper
B014.04 Flexible aluminium tube, 100 x 1.5 m

BITUMEN CONTENT FURNACE BY IGNITION METHOD

UNE EN 12697-39 / ASTM 308-99 / AASHTO T 164

B014 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!
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 sol-vent extraction method by eliminating the primary cost of solvent purchase and the secondary cost of solvent disposal.
Content Furnace eliminates the exposure of the asphalt technician to harmuful 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 compen-sates 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 basktes, 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: 230 V 1 F 50 Hz 4800 W 20 A
Temperature range: 200-650°C Weight: 120 Kg

AUTOMATIC EXTRACTION OF BITUMEN
UNE EN 12697-1 / ASTM D2172 / DIN 1996 / CNR A VII Nº 38

B015 Used to perform reliable analysis on bituminous mixtures utilizing the perchloroethylene (PCE) or tetra-chloroethylene solvent which is classified: R40 not cancer producing (see note*), 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 bitumi-nous mixture;
- the separation of the filler from the solution formed by solvent, bitumen and filler;
- the recovery and distillation of solvent material allow-ing a further utilization.

The unit comprises:
- An electromagnetic sieving unit, insuring high quality double vibrating action (vertical/rota-tional), with solvent spraying cover for washing and disaggregation of the sample.
- 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.
- A solvent recovery unit having reclaiming capacity of approx. 50 l/h, equipped with cooling system foreseen of devices switching.
- A separate control panel allows to program all these functions in a fully automatic system. It is also possible to select the manual functi.

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: 400 V 3 ph 50 Hz 5,5 kW
Overall dimensions: 1400x680x1820 mm. Total weight: 185 Kg

Accessories:
B015.01 Stainless stell Beaker dia. 120 mm.
B015.02 Sieve Ø200 mm fully stainless steel. ASTM 200
B015.03 Sieve Ø200 mm fully stainless steel. ASTM 170
B015.04 Sieve Ø200 mm fully stainless steel. ASTM 100
B015.05 Sieve Ø200 mm fully stainless steel. ASTM 50
B015.06 Sieve Ø200 mm fully stainless steel. ASTM 30
B015.07 Sieve Ø200 mm fully stainless steel. ASTM 10

MIXER 20 AND 30 LITRES CAPACITY
EN 12697-35

B016 This large capacity mixer has been designed to mix bituminous samples for compaction tests, Marshall and tensile splitting test and for other tests where uniformity is required. Thanks to the planetary action this mixer ensures a complete and uniform mixing. The machine is provided with a variable speed drive allowing to set a wide range of speeds. The stainless steel cover can be lifted to inspect the boxl, and in this case the motor automatically turns off to prevent accidents to CE safety Directive.
A timer allows to select the mixing time or the continuous mixing.
The mixer is supplied complete with stainless steel bowl 20 litres capacity, but "without" whisk beater, "without" coupling and "without"electric heater that must be ordered separately (see accessories).
Power supply: 400V 3ph 50Hz 1,1kW (230V 1ph on request)
Dimensions: 489x693xh 944 mm
Weight: 110 kg approx.
B016.10 Mixer 20 litres capacity identical to mod. B016 but with power supply 230V I ph 50 Hz 1,1 KW
B016.11 Mixer 30 litres capacity identical to mod. B016, but with bowl capcity 30 litres. Power supply: 400V 3 ph 50 Hz 1,1 KW
B016.12 Mixer 30 litres capacity identical to mod. B016.11 but with power supply: 230V Iph 1,1 KW

Accessories:
B016.01 Isomantle heater, electric, complete with thermoregulator.
B016.02 Spiral beater
B016.03 Whisk thick wire beater, conforming to EN Specifications.

Supplied complete with bag retainer ring and 10 spare bags
B017.01 Residue Bag

Regenerator (recuperator) solvent capacity of 25 l. with digital indicator

TECHNICAL CHARACTERISTICS:
Regenerators solvents:

Modelos	B018
Tank capacity	25 lts
Power supply	220-240v/1/50-60 hz
Operating voltage	2570 w
Temperature	50-190 ºC
Heating	Indirecto aceite diatérmico
Total Oil	14 lts.
Refrigeration	Ventilación forzada por aire
Normative electrical part	EN-60204-1
Dimensions	600 x 850 x 1100 mm
weight	75 kg

B018.01 Bolsa de residuo

Regenerator (recuperator) solvent of 15 l. capacity with digital indicator

TECHNICAL CHARACTERISTICS:
Regenerators solvents:

Modelos	B017
Capacty	15 lts.
Power supply	230/1/50-60 hz.
Operating voltage	low Voltage 24 v.
Installed power	1600 w.
Temperature	50-190ºC.
Heating	Indirect thermal oil
Total Oil	7.5 lts.
Refrigeration	Forced air ventilation
Normative electrical part	EN-/50014/ EN-50015/EN-50018 / 60204-1
Dmensions	500 x 720 x 1050 (h) mm
Weight	60 kg.

Supplied complete with bag retainer ring and 10 pare bags

B019 Kerosene centrifuge suited for research centers. LCD panel with microprocessor control Digital control with speed selector, maximum 4,200 rpm and 2,603 x g. 100 rpm, timer of 0-99 minutes and hold position, push open lid, rotor-lights tour, open top light or not properly closed. Metal housing with air circulation to avoid excessive temperatures in the chamber. Camera centrifugation quality stainless steel AISI 304. Manufactured according to EC guidelines. Supplied complete with two cups swivel open metal ends of Ø52, 39x71, 4 mm high, fitted with a perforated brass plate. Power: 220 V, 50 Hz

B019.01 Rotor for Kerosene test.

AUTOMATIC ASPHALT LARGE LABORATORY MIXER, 32 LITRES CAPACITY
EN 12697-35/ ASTM D6307/ AASHTO TP53

B020 The PaveMix has been expressly designed to prepare homogeneous bituminous mixtures at a strictly controlled temperature.
The preparation of the bituminous sample is obtained in a short time period (a few minutes) to avoid any mechanical aggregate degradation and to fully coat all mineral components, as requested by EN 12697-35.

The mixer produces representative samples to perform:
- Gyratory compaction tests (EN 12697-10, EN 12697-31)
- Marshall stability tests (EN 12697-34, EN 13108)
- Wheel tracking wet and dry tests (EN 12697-22)
- Slabs compaction laboratory tests (EN 12697-33)
- Beam fatigue and Stiffness tests (EN 12697-26, EN 13108)
- Asphalt general purpose tests.

PaveMix consist of:
- Main frame holding a horizontal stainless steel bowl with a helical mixing shaft.
- The bowl, double wall insulation made of stainless steel AISI 316, contains an electric heater with probe sensor granting constant and uniform temperature control.
- An electromechanical motion allows to tilt the bowl to get easy the unloading operation.

The control panel foresees:
- Digital thermo-regulator to set temperature andto control the mixing temperature.
- Mixing speed regulator.
- Main and start/stop switches.
- Command to tilt the bowl.

Technical Specifications and features:
- Mixing capacity: 32 litres max.
- Mixing bowl: stainless steel AISI 316
- Mixing temperature: selectable from ambient up to 260°C through sensitive probe and digital display control.
- Mixing speed: adjustable from 4 to 40 rpm.
- Easy tilting unloading operation by electromechanical motion.

Heating power: 3000 W
Power supply: 230V 1ph 50/60Hz 4500 W
Dimensions: 1280 x 700 x h1210 mm
Weight: 350 kg

MARSHALL AUTOMATIC COMPACTOR
UNE EN 12697-30, 12697-10 / BS 598:107

B022 This ruggedly constructed apparatus automatically compacts the bituminous sample and stops off the motor after the preset number of blows has been completed on the automatic digital display counter.
The trip mechanism is structured so that the sliding hammer falls at the same height at every blow.
The mould is held in position by a fast clamping device.
The compactor includes a vibrated concrete base where a laminate hardwood block is mounted.
Total weight of the compaction hammer (Rod + Foot + Sliding mass): 7850 ± 50 g
Sliding mass weight: 4535 ± 15 g
Free fall height: 457 ± 5 mm
Blow frequency: 50 blows in 55/60 seconds.
The machine is equipped with safety door, conforming to CE Safety Directive.
When opened it stops automatically and cannot operate.
All moving parts are quickly/easily accessible for maintenance.
The compactor is supplied complete, **"except for the mould"** that must be ordered separately.
Power supply: 230 V 1 ph 50 Hz 300 W
Dimensions: 500 x 500 x 1890 mm
Weight: 220 kg

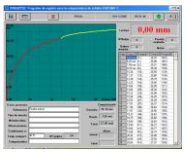
.Accessories:

B022.01 Vibrated concrete Base 450x450x200 mm.
B022.02 Compaction hammer for the machine
B022.03 Cabinet, for noise reduction within CE limits
B022.04 Marshall compaction test software
B022.05 Potentiometric sensors 50 mm. linear IP63
B022.06 Control module for measuring deformation
B022

B022

B022.05

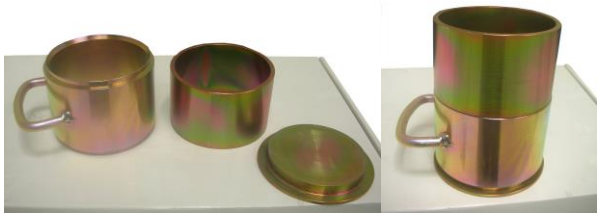
B022.06



MARSHALL COMPACTOR, HAND OPERATED, FOR MOULDS DIA. 4''
ASTM D6926, D5581, D1559 / AASHTO T245

B023 Supplied complete with compaction hammer 4" diameter, wooden pedestal capped with
steel plate and mould clamp device, support/ hammer guide.
Dimensions: 320x320x1700mm
Weight: 45 kg approx.

B023.01 Marshall compaction hammer manual weighs 4.53 kg type "Army". Height 457 mm.
B024 Marshall mould solderless steel, treated against corrosion.
B025 Filling collar to adapt to the mould Marshall
B026 Baseplate for Marshall Mould
B027 Filter paper Marshall box of 100



UNIVERSAL EXTRUDER
UNE 103.400 / ASTM D698 / BS 598, 1377
S123 Hand operated actuated by a 5 tons hydraulic jack. 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.
Supplied complete with adaptors.
Dimensions: dia. 300x500 mm
Weight: 30 Kg

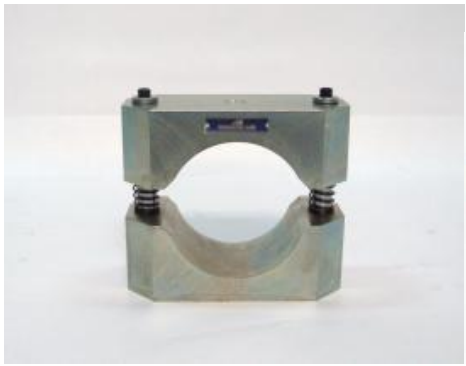
MARSHALL TEST MACHINE
UNE EN 12697-34 / UNE 103.502 / EN 13108 / ASTM D1559 / BS 598:107
B029 Machine capacity 50 KN for testing MARSHALL Manufactory by a sturdy frame with two columns chrome. The upper deck where it engages the load cell and the swivel plate serves as closure of the test frame. This can be positioned at will with locking system. Operation via the gear motor to the load applied by a spindle at constant speed. It has dual limit. Control module available with digital display with two display to measure the force, deformation or penetration and potentiometric sensor for measuring strain or specimen thickness. Supplied complete with protective screen test area.
Capacity: 50 KN.
Dimensions: 1550 x 500 x 450 mm.
Distance between tie bars: 300 mm.
Power supply: 220 V, 50 Hz.

Accessories:
B029.03 Metal structure for the placement of the machine

B032 Marshall rectangular thermostatic bath for 15 specimens cured. Interior made of stainless steel. Bridge adaptable thermostat with digital display on the edge of the bath; provided agitation system, heating and thermometer-thermostat that can regulate its temperature between ambient ± 5 ° C and 99.9 ° C. Supplied complete with digital electronic thermostat bath.
Useful dimension of the basin: 600 x 200 x 480 mm.
Power supply: Single phase 220 V.

B033 Marshall thermostatic bath similar to above, but with the following
Dimensions: 480 x 200 x 290 mm.

Accessories:
V043 Tray covers-bath resistances of 20 l.




B035 Marshall jaw (stability mould) 4"Ø(101,6 mm) manufactory in steel machining and treated against corrosion. Supplied complete with support bracket to comparison. Weihgt 6 Kg

Accesorios:
V364 Dial gauge stroke 10 mm, div. 0,01 mm
V360 Dial gauge stroke 12,5 mm, div. 0,01 mm
B036 Marshall load piston, manufactory of machined steel and treated against corrosion.
B037 Disco extractor with plunger
V370 Magnetic base with articulated arm


VIBRATING HAMMER COMPACTION
UNE EN 12697-32 / BS 1377/4; BS 1924/2
S147 Kango hammer, alternative method for soil compaction and density determine the relationship between dry and the moisture content.
Supplied in a carrying case.

Accessories:
S147.01 Tool carrier
S147.02 Tamper, Ø 146 mm, used for CBR, gravel-cement tests, etc.
S148 Kango hammer support to achieve uniform compaction. Manufactured in a steel structure with anti corrosion treatment, where it engages the hammer and the mold.

EN 12697-9, 12697-10, 12697-32 / BS 598:104
B040 P.D.R. moulde (Porcentaje Refusal Density)
Mould for determining the degree of compaction of the bituminous pavements.
Manufactured cylindrical steel tube corrosion treatment, generating open and close with screws and two hooks crabbing allowing perfect anchor to the base of the mold.
Dimensions: 152 x 170 mm
Weight: 12,100 g

ROLLER COMPACTOR
EN 12697-33

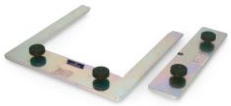
B042 This Roller Compactor entirely developed and manufactured by Group I&S, fully operates with the electro-mechanical system, and therefore it does not require any air source (compressor) or hydraulic pressure.
It is used to produce representative sample slabs of several dimensions of bituminous mixtures laid and compacted on site. The compaction is performed through a segmented roller with alternated operated rotation which simulates the on-site action of a street roller. The compaction cycle can be programmed in accordance to a certain load or deformation value.
The flexibility of the program grants the production of samples with uniform density and dimensions, fully meeting Standards specifications and research requirements; these samples are compatible for rut test with Group I&S Wheel Tracking apparatus B043.
The sample slabs can be also cored or cut off to obtain cylinders and beams for bending fatigue, indirect tensile, static and dynamic creep, stiffness, and 4-point tests.

MAIN FEATURES:

- Sturdy frame made of steel
- Mould supporting table with alternating displacement system, for table displacement and vertical load pressure
- Integrated touch screen control unit based on Windows operating system**.** The control unit runs like a standard PC for the management and analysis of data, test results, graphs.
  The **touch-screen icon interface** allows an easy set up of the parameters and an immediate execution of the test.
- Direct Internet and Intranet (LAN) connection for remote technical assistance. This features allows operators to establish a remote communication and receive software updates or an immediate diagnostic analysis of the potential problem from Matest technicians.
- Unlimited memory storage with: 2 USB ports,1 SD card slot.
- Heating of the segment roller (optional)
- Simple and quick roller and mould positioning
- Perfect horizontal flatness of the slab surface
- Uniform density and dimensions of the slabs
- Easy to maintain

TECHNICAL SPECIFICATIONS:

Three transducers are installed to manage the roller and table displacements and vertical load pressure.
The compaction cycle can be programmed up to a certain load or deformation value. When deformation value is programmed, the
system automatically programs the suitable loads to obtain the selected final thickness.
The flexibility of the program grants the production of samples with uniform density and dimensions, fully meeting Standards Spec. and Research requirements.. A friendly and easy to use interface allows an immediate and fully automatic test execution, data acquisition and processing, test report and file.
The Roller Compactor is supplied **"without"** roller segment, slab mould, centering plate that must be ordered separately (see accessories).
Power supply: 230V 50/60Hz 1ph 2100W (3100W with the heated segment roller)↗



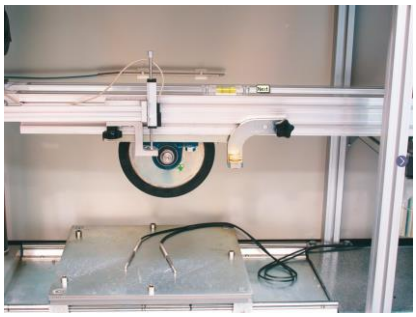
Dimensions: 2200x1030 xh 1880 mm (2410mm with opened guard)
Weight: 1300 kg

Heating of the Segment Roller

Possibility to heat and control temperature of the Segment Roller mounted on the Compactor and Sliding Carriage to keep the mould warm and avoid thermal shocks the might affect specimen's workability.
The equipment is composed by:

ACCESORIOS:

Segmento de rodillo, dimensiones disponibles:
B044-04 Roller for 320x260mm mould
B044-05 Roller for 500x400mm mould
B044-06 Roller for 400x305mm mould
B044-07 Roller for 305x305mm mould
MOLDES para preparar placas de aglomerados:
B043-09 Mould for slabs 320x260x180mm
B043-10 Mould for slabs 305x305x50mm
B043-11 Mould for slabs 305x305x100mm
B043-12 Mould for slabs 400x305x50mm
B043-13 Mould for slabs 400x305x100mm
B043-18 Mould for slabs 500x400x180mm
B043.19 Mould for slabs 400x305x120 mm
B043.20 Mould for slabs 320x260x50 mm
B044.21 Centering plate for 400x305 mm mould
B044.22 Centering plate for 305x305 mm mould
B044.23 Centering plate for 320x260 mm mould
B044.15 Rolling vibrating device
B044.02 Control unit mounted in the Roller Compsctor, it foresees a thermoregulatory circuit, complete with probe to measure and to adjust the temperature from room up to 180ºC.
B044.03 Sliding cart heating option.
Thermoregulated circuit with temperature probe to set and control cart temperature and keep mould hot



Firmware
The multilingual testing firmware allows:
- Management and automatic control of machine and test.
- Setup of all test parameters.
- Test data acquisition and processing.
- Real time display of: number of cycles, rut depth, temperatures. Real time cycle rate will also be displayed when using a serial connection to PC
- Calibration menu for setting and checking all test data.
- From the control board, it is possible to select parameters, set data acquisition and processing according to EN and BS test procedures, with:
Identification data of the sample (slab) under test.
Cycle frequency.
Number of passes to end the test.
Max rut depth to end the test.
Sampling frequency of the rut depth.
Testing temperature.
Sample (slab) thickness.
The use of the B043 Wheel Tracker requires connection to a PC with Windows 98, 2000, XP minim

PLASTIC DEFORMATION RESISTANCE
WHEEL TRACKING
EN 12697-22/ BS 598:110
B043 This test, developed in laboratory, consists in evaluating the deformation (rut) depth of a bituminous mixture subjected to cycles of passes of a loaded rubber wheel under constant and controlled temperature conditions.
To perform the test, a wheel tracking apparatus is used to simulate the effect of traffic and to measure the deformation susceptibility of the bituminous sample.
Wheel tracker performs the test as per procedures A and B (6 or 2 tests), clearly specified by the EN Standard.

Technical specifications
- The machine fully satisfies both EN 12697-22 and BS 598:110 Specifications.
- Travel of the table: 230 +/- 5 mm
- Table cycle frequency: adjustable 15 to 40 cycles per minute.
- Hard rubber tyred wheel having outside diameter 200 mm
- Wheel load on the sample: 700N +/-10N (EN 12697-22) or 520N (BS 598:110). The load is applied on the sample through a lever.
The effective load applied on the sample can be adjusted by micrometrical weights positioning.
- Continuous real time rut depth measurement (penetration of the wheel into the sample) through a linear transducer 40 mm travel by 0,01 mm accuracy.
- The test frame is made of robust aluminium alloy and it is contained in a climatic cabinet with adjustable temperature from 30 to 65°C. +/- 1.0°C.
The cabinet is equipped with two doors with insulated glass for inspection
- The sample table has dimensions: 400 x 390 mm and can accept rectangular slabs of several sizes:
305 x 305 mm, 50 or 100 mm high
305 x 400 mm, 50 or 100 mm high
200 mm dia. core samples, 50 mm high
The sample confinement frames are not included and have to be ordered separately (see accessories)
- Wheel tracker accepts also samples with dimensions up to 400 x 500 mm, 180 mm high (this mould can be compacted with Group I&S Roller Compactor)
- The machine is supplied complete with adaptors for a correct mould positioning and locking
- The wheel tracker is equipped with 3 temperature probes:
1 probe, connected to the thermoregulator, for the control andadjustment of the cabinet temperature.
2 probes for temperature measurement inside the specimen.

Hardware
- Data acquisition and processing system fully managed by microprocessor.
- Multifunctions keyboard with encoder for easy and rapid setup.
- Large graphic display 320x240 pixel.
- RS 232 port for connection to PC.

Power supply: 230V 50/60Hz 1ph 2200W
Power rating of the table: 500 W
Dimensions: 1580 x 650 xh 1790 mm
Weight: 400 kg approx.

Accessories:
B045.01 Hardened specimen cylinder Ø100 mm complete with bottom plate
B045.02 Hardened specimen cylinder Ø150 mm complete with bottom plate.
B045.03 Hardened specimen cylinder Ø100 mm with holes for cold mix compaction, compete with bottom plate
B045.04 Hardened specimen cylinder Ø150 mm with holes for cold mix compaction, compete with bottom plate
B045.05 Top penetration piston Ø100 mm
B045.06 Top penetration piston Ø150 mm
B045.07 Filter Paper Ø100 mm (pack 100 units)
B045.08 Filter Paper Ø150 mm (pack 100 units)
B045.09 Pneumatic automatic specimen extruder
B045.11 Air compressor, low noise, 220v, 50 Hz.
B045.12 Vertical forcé testing device qith load ring
B045.14 Kit of 2 distance pieces of 105 and 115 mm high for the control of the height values measured by the linear transducer

GYRATORY COMPACTOR
EN 12697-10 / 126931 / ASTM D6925 / AASHTO T312 / SHRP M-002

B045 Gyratory compactor is used to simulate and reproduce actual conditions compaction operations in actual road pavement, thus determining the asphalt compaction properties.
Such compaction is achieved by the combination of rotary action and the resulting vertical force applied by mechanical force.
The compactor has a steel frame which ensures high rigidity excellent control angle.
The load is applied by an electro-pneumatic cylinder, controlled by a servo pressure regulator, the height is measured by a linear transducer.
Rotational movement is generated by a system which allows high precision eccentric easy to set accurately and steering angle.
The rotation speed is controlled by the control software via microprocessor.
The results obtained are also used in the investigation of the volumetric and mechanical characteristics of asphalt mixtures.

FEATURES

- Manufactured steel frame ensures rigidity adequate control angle.
- Electro-pneumatic servo-regulated by controlled
- Electronic control unit with touch screen, which works like a standard PC operating system based on Windows, allows easy parameter settings for immediate execution and automatic test, data acquisition, processing, and graphics files.

Unlimited memory storage

TECHNICAL SPECIFICATIONS:

- Mould Dimensions: diameter 100 and 150 mm, height of 0-200 mm for both molds.
- Swivel angle: adjustable from 0 to 2.4 °
- Number of cycles (rotary): Adjustable from 1-5000
- Rotation angle: adjustable from 5 to 60 working cycles / min (30 cycles per minute required by the Rules)
- The vertical load of 150 mm diameter at the sample: adjustable from 10 to 900 kPa (with a compressor 8 bar)
- The vertical load in samples 100 mm in diameter: Adjustable from 23 to 1500 kPa (7 bar compressor)
- The vertical load on the sample is automatically controlled and adjusted by the electronics.

Power supply: 220V, 50Hz., 1000W
Dimensions: 650x500xh1000mm
Weight: 235 kg approx.
Compressed air required, a minimum of 8 bar (must be ordered separately).
The gyratory compactor is supplied complete with standard height block, lubricants, power cord. (See accessories).

KUMAGAWA (SOXHELET) EXTRACTOR
EN 12697-1 / EN 13108 / LCPC CNR N. 38

B047 Designed to extract the bitumen emulsions. Assembly consists of a heating mantle, flask of 1000 ml capacity refrigerant balls, glass plug 25 and filter cartridge.
Power supply: 220V, 50 Hz

B048 Kumagawa extractor (Soxhelet) similar to mod. B047, but of 2 l. capacity.

Accessories:
B047.01 Filters cartridge Ø58x170 mm (25 pieces)
B048.01 Filters cartridge Ø80x200 mm (25 pieces)

DETERMINATION OF THE WATER SENSITIVITY OF BITUMINOUS MIXTURES UNE EN 12697-12

B032 Marshall Water bath rectangular thermostatic for crued 15 specimens. Interior made of stainless steel. Bridge adaptable thermostat with digital display on the edge of the bath; provided agitation system, heating and thermometer-thermostat that can regulate its temperature between ambient ± 5 ° C and 99.9 ° C. All elements are immersed stainless steel and has an adjustable flow lift pump 5 liters / min for circulation and agitation.
Supplied complete with digital electronic thermostat bath.
Useful dimension of the basin: 600 x 200 x 480 mm.
Single phase 220 V.

B033 Marshall thermostatic bath similar to above, but with the following dimensions:
480 x 200 x 290 mm.

Accessories:
V043 Cover slip resistance.

B050 Desktop team cooling, all stainless steel. Cooling constant without temperature control.
Hermetically sealed compressor with anti-vibration condenser and evaporator immersion in stainless steel AISI-316.
Immersion evaporator measures 32 mm x 160 mm long.
Hose 900 mm. long.
Equipment designed for cooling liquid in thermostatic baths which require a temperature below ambient.
For temperature control must be used in conjunction with an immersion thermostat.
Temperature range: Ambient to -10 ° C
Dimensions: 330x275x350 mm
Power supply: 220V, 50 Hz, 166 W
Weight: 14 Kg

NOTE: To perform this test need a press Marshall B029 or B030 and B031 indirect traction device.

B050 **B031**

B031 Used to measure the splitting tensile strength and the radial strain of a Marshall specimen dia 4" and 6", where a vertical load is applied. Supplied complete with knives to test specimens having dia. 4" and 6". Steel manufactured, plated against corrosion. As analog or digital gauges (not included)
Dimensions: dia. 248x270 mm
Weight: 14 kg

CONSISTENCY DETERMINATION, PENETRATION BITUMEN UNE EN 1426 / UNE 104281-1,4 / BS 2000 / ASTM D5, D217 / AASHTO T49 / NF T66-004

B052 Standard penetrometer 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 an aluminium base table with levelling screws, plated vertical rod, "**micrometric vertical adjustment device**". 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, brass sample cups dia. 55x35 mm and 70x45 mm.
Dimensions: 220x170x410 mm.
Weight: 11 kg

B052.10 Basically structured as mod. B052 but having a magnetic controller device with electronic digital programmable timer that automatically releases the plunger head and ensure free falling of the needle during the 5-seconds test.
Power supply: 230 V 1 ph 50/60 Hz 200 W
Dimensions: 220x280x410 mm.
Weight: 15 kg.

B053 B053.10

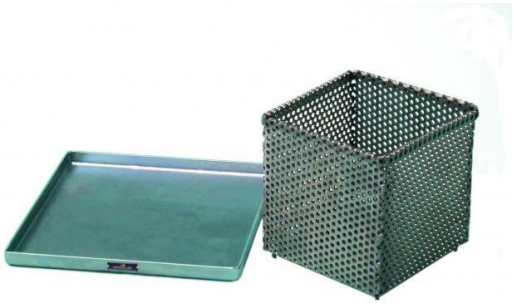
Accessories:

B052.01 Sample cup, brass made, dia 55x35 mmh.
B052.02 Sample cup, brass made, dia 70x45 mmh.
B052.03 Mirror for easy adjustment of the needle
B052.04 Ø1 Penetration needle, Ø1.00 mm
V9117 Termometer ASTM 17C (+19 º C to 27 º C).
B052.07 Termometer IP 38C (+23ºC to +26ºC) rad 0,1ºC
B052.05 Transfer dish, made from glass, with support

B053 Standard digital penetrometer 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 an aluminium base table with levelling screws, plated vertical rod, "**micrometric vertical adjustment device**".
The slider is brass made with free fall. The digital readout of the penetration values has readings in mm and inch, with 0,01 mm resolution, LCD 5 digits display, with zero set in any position.
Power: 1,5V battery.
The penetrometer is supplied with stop and release push button, automatic zero set, micrometer adjustment, set of weights 50 and 100 g penetration needle, brass sample cups dia. 55x35 mm and 70x45 mm.
Dimensions: 220x170x410 mm Weight: 11 kg

B053 Semi-automatic digital penetrometer Basically structured as mod. B053 but having a magnetic controller device with electronic digital programmable timer that automatically releases the plunger head and ensures free falling of the needle during the 5-seconds test.
Power supply: 230 V 1 ph 50/60 Hz 200 W
Dimensions: 220x280x410 mm
Weight: 15 kg

B055 Thermostatically controlled water bath for penetrometer
Provides water at the required temperature of 25 ±0,1°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, cooling coil device, current water operated, to maintain a constant temperature of the bath when room temperature is slightly higher. 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. B052-05).
Power supply: 230 V 1 ph 50/60 Hz 350 W
Dimensons: 375x335x420 mm
Weight: 12 kg



UNE EN 12697-18 / EN 13108
B058 Metal mesh basket 100 x 100 x 100 mm to determine the drainage of samples obtained at different bituminous mixtures with mineral aggregates or fine additive.
The basket is manufactured of stainless steel mesh Ø3 mm.
B058.01 Ray 160x160x10 mm made of galvanized steel

Breaking value of cationic bitumen emulsions. Mineral EN 13075-1
B059 Breaking value of cationic bitumen emulsions. Mineral filler method.
Equipment for the determination of the breaking value of cationic emulsions, (manual version) comprising: Filler feeding pan, complete with support base and clamp, nickel
spatula, two round porcelain dishes.
Weight: 2 kg approx.
B059.05 Reference Filler container 25 kg
B059.06 Support base for stirrer
B059.10 Electric stirrer having 260 rpm., 230V 50 Hz I ph.
B059.11 Propeller for electric stirrer

IMMERSION COMPRESSION / SIMPLE COMPRESSION BITUMINOUS MIXTURES ASTM D1047 / AASHTO T167
B060 Cylindrical steel mould with internal diameter of 101.6 x 177.8 mm high..
B061 Bottom piston, Ø 101.5 x 50.8 mm high.
B062 Top piston, Ø 101.5 x 201.6 mm high.
B063 Support with square section measuring 25 x 75 mm long.

DURIEZ TEST
ASTM D1047 / NF P98-251-1,4 / AASHTO T167
TEST FOR ASSESSING THE CHARACTERISTICS OF BITUMINOUS MIXTURE COMPONENTS
Two types of specimens Ø80 or 120 mm.
B065 Duriez Ø 80 mm mould
B066 Mould Base
B067 Piston
B068 Demoulding Cylinder

Complete Duriez test set for Ø 120 mm, including:
B069 Duriez Ø 120 mm mould
B070 Mould Base
B071 Piston
B072 Demoulding cylinder

THIN FILM AND LOSS ON HEATING DETERMINATION. TFOT METHOD
UNE EN 12607-2, 13303 / UNE 104.281 / ASTM D6, D1754 / BS 2000 / AASHTO T47, T179

B075 Internal chamber and external frame all made from stainless steel, double wall insulation with fiberglass, double door. Temperature control by digital thermoregulator. The oven is equipped of a dual safety thermostat to prevent accidental over-heatings. 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: 230 V 1 ph 50 Hz 1500 W
Internal dimensions: 330x330x330 mm
Outside dimensions: 460x450x700 mm
Weight: 40 kg

THE OVEN MOD. B064 CAN BE EQUIPPED IN TWO VERSIONS, WITH THE FOLLOWING ACCESSORIES:

B075.01 Rotating shelf complete with 9 containers dia. 55x35 mm for the "Determination of Loss on Heating" to: EN 13303 / ASTM D 6 / BS 2000 / NF T066-011 / AASHTO T47 / CNR N° 50 / NF T066-011 - AASHTO T47 Standards.
B075-03 Rotating shelf, complete with 2 containers dia. 140x9,5 mm for the "Determination of Thin Film" to Standards: EN 12607-2 / ASTM D1754 / AASHTO T149 / UNE 7110.
Accessories:
B075.02 Brass container Ø 55 x 35 mm
B075.04 Aluminium rotating plate with two Ø 140 x 9.5 mm

ROLLING THIN-FILM OVEN ASTM / EN
EN 12607-1 / ASTM D2872 / AASHTO T240
B076 EFFECT OF HEAT AND AIR ON A MOVING FILM OF ASPHALT. RTFOT METHOD
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.
The oven is equipped of a dual safety thermostat to prevent accidental over-heatings.
Power supply: 230 V 1 ph 50 Hz 1700 W
Dimensions: 620x620x910 mm
Weight: 56 kg

Accessories:
B076.01 Capsules Ø64x140 mm glass
V9113 Thermometer ASTM 13C, range 155 ° to 170 ° C

DISTILLATION FLUIDIFIED BITUMEN
UNE EN 1431 / ASTM D402 / AASHTO T59
B092 Complete equipment for fluidified bitumen distillation consists of the following components:
B092.01 Distillation flask, capacity 500 mL
B092.02 Flask protection device
B092.03 Glass Liebig West condenser.
B092.04 Extension with 105° angle
V9118 Thermometer ASTM 8C (- 2 + 400 °C)
B092.05 100 ml specimen
B092.06 Container for residue 75 x 55 mm
V243 Bunsen gas burner
V284 Ring with bosshead to hold the flask
V255 Plate base support (2)

Bituminous emulsios:
Residue on sieving
EN 1429
B094 Sieve staninless steel, 75 mm dia, 0,5 mm opening
B095 Sieve staninless steel, 75 mm dia, 0,16 mm opening
B095.01 Cover stainless steel, 75 mm dia
B095.02 Pan stainless steel

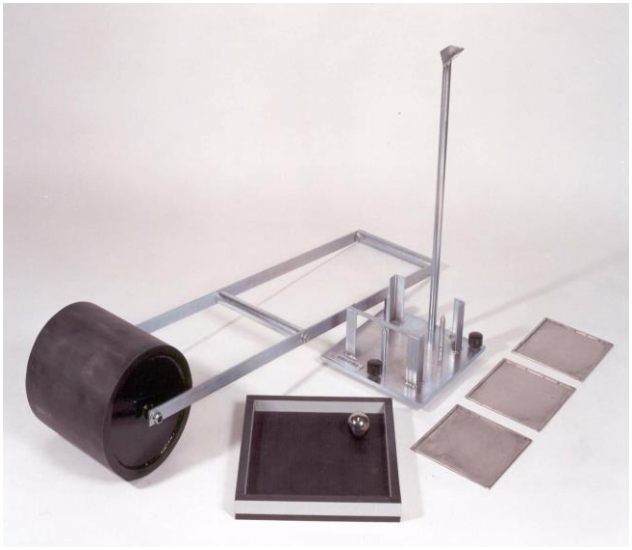
COLLECT SAMPLES
ASTM D140 / AASHTO T40
B096 Bacon sampler for sampling within one asphalt tanker at different depths. The equipment consists of a cylindrical body with a lid at the top and one at the bottom and a tapered piston that acts as shut off valve. It has both at the top and at the bottom with holes for attaching a rope (not included) for introducing into the reservoir.
Capacity: 237 ml
Dimensions: Ø50x250 mm
Weight: 2 kg approx.

ASTM C188, C189/ BS 812
RELATIVE DENSITY FILLER
B097 Pycnometer manufactured in glass 250 ml capacity. It has deep concavities facilitate stirring of the sample.
Length: 250 mm approx.
V6225 Funnel German form of short branch Ø100 mm

VIALIT BINDER ADHESION TEST
UNE EN 12272-3 / NF P98-274-1

B099 Equipment Vialit board to evaluate the adhesion property of aggregates of bitumen on the rolling surface of rolled asphalt.
A metallic base formed by three rods with sharp vertical supports on which the test plate, a vertical metal bar 500 mm. high with a superior device to the ball drop, ball 500 gr. steel test three steel plates and a rubber covered roller compaction drag manual.

Accessories:
B099.01 500 g steel ball
B099.02 Metal plate test
B099.03 Stainless steel basket 3 mm mesh and 500 g of capacity.



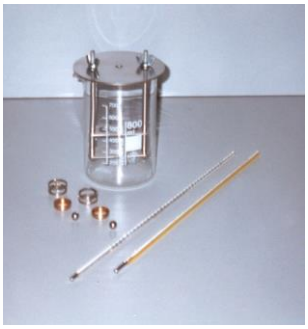
AUTOMATIC DIGITAL PENETROMETER
EN 1426 / ASTM D5 / BS 2000 / NF T66-004 / NLT 124 / AASHTO T49 / UNI 4162 / UNE 7013 / CNR N° 24

B100 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.
USB port for printer or PC connection (with the accessory B100.01)
Supplied complete with **automatic plunger with conductivity detection kit,** needle, weights, sample cups.
Power supply: 230V 1 ph 50 Hz
Dimensions: 260 x 320 x 540 mm. Weight : 23 kg

BITUMINOUS SLURRIES ABRASION MACHINE
UNE EN 12274-5 / NLT 320/87 / ASTM D 3910

B102 Apparatus wet abrasion bituminous slurries. Is designed to determine the wear resistance of bituminous slurries used in road construction. The equipment consists of a thermostatic bath to immerse the specimen and the abrasion head planetary rotation. The thermostatic bath (optional) is controlled by a thermostat type out - overboard. Temperature control is programmable via the digital microprocessor. The abrasion mechanism, a planetary motion to print head abrasion. Abrasion time is programmed and operated by the user.
The unit is supplied with three annular test molds of different sizes.
External dimensions: 500 x 700 x 440 mm
Power supply: 220 V 50 Hz
B102.01 NLT 320 Set de moldes 6,3 a 8,2 de 10,5 mm altura.
B102.02 Set molds 6,3 - 10 - 13 19 mm height EN 12274-5

B102.06 Tthermostatic stirrer with temperature control



RING AND BALL SOFTENING POINT APPARATUS EN-1427 / ASTM D36 / AASHTO T53 / DIN 52011 / BS 2000

B105 Equipment for determining ring and ball softening point of the bitumen. Formed by a stainless steel bracket height adjustable, two rings, two centering guides, steel balls and two 800 ml beaker. Capacity is low.

Accessories:
V9115 ASTM 15C thermometer
V9116 ASTM 16C thermometer
B105.01 Centring guides
B105.02 Tapered rings
B105.03 Stell ball
V243 Bunsen burner
V265 Metal fabric with ceramic fibres, 120 x 120 mm
V281 Tripod round ring Ø 100 mm.
V111 Magnetic stirrer with heating

Automatic Digital Ring ball apparatus EN 1427 / ASTM D36, E28 / IP58 / DIN 52011 / ISO 4625 / NFT 66008

B106 This "high tecnology" digital microprocessor tester, automatically determines the softening point of asphalts and pitches.
Two laser sensors detect the balls fall determining the softening point.
The bath temperature is measured by an electronic system maintaining the gradient (5°C./min) as specified by the Standards.
Real time visualization of the Temperature (°C)-Time (sec) graph along the entire test.
A magnetic stirrer with electronic speed adjustment from 0 to 160 rpm also ensures an uniform temperature in the vessel during the test execution.
The touch-screen graphical interface allows an easy set up of the parameters and the immediate execution of the test.
High resolution color display, 1/4 VGA, offers all the functions of a PC for the management and analysis of data, test results, and graphs.

Main Functions:
Touch-Screen display like a normal PC
Unlimited memory
Multilanguage selection
Microprocessor friendly-driven menu to control all the test phases
Top quality components: laser sensors, electronic magnetic stirrer, ceramic-glass heating plate
Fully automatic
Two test parameters can be selected by the microprocessor menu:
- test on boiled distilled water for softening point from 30 to 80°C.
- Test on glycerol for softening point from 80 up to 150°C.
Language selection: English, French, Spanish, German, Italian, Polish, Russian, Greek, Portuguese, Dutch.
Functions of: clock calendar, test number, user/customer name, general notes, start/end of the test.
Real time visualisation of the bath temperature, test progress, rpm of the stirrer. **Unlimited memory, with possibility to save data onto an external memory (USB pendrive, SD card) and then edit them through an Excel spreadsheet.** ↗

The tester is basically composed by:
- Ceramic-glass heating plate with automatic cut off at the end of the test cycle.
- Motherboard with microprocessor, which controls: heater/stirrer, temperature probe, laser sensors, pre-heating phase of the plate, and memorizes all the test parameters.
- Steel balls centering device.
Power supply: 230V 1ph 50/60Hz 700W
Dimensions: 500x350xh550 mm
Weight: 20 kg approx.

ACCESSORY:
B106.11 Rods with spherical ends (set of 2 pieces). For checking and calibration **of the instrument.**

SPARE PARTS for B106:
B105.01 Brass centring guide, chromed
B105.02 Brass tapered ring, chromed
B105.03 Steel ball 9,5 mmm dia.
V6807 Glass beaker 800 ml.

CLEVELAND OPEN CAP FLASH AND FIRE POINT TESTER
UNE 51023 / EN 22592 / ASTM D92 / BS 4689 / AASHTO 48

B109 Cleveland electrically heated apparatus for determining the flash and fire points of lubrificated oils and petroleum products.
Complete with brass cup, thermometer IP 28C (ASTM 11C) range -6 +400°C., electric heater with thermoregulator, double line fuse.
Supplied "without" flame gas device to be ordered separately.
Power supply: 230V 1ph 50/60Hz 600W
Weight: 10 kg

B110 Flame gas device, complete with gas-stop valve controlled by a flame sensor and maximum thermostat with reset button.
It can be sold in CE markets, but not usable in closed spaces.

B110 **B111**

ASTM D1310, D3143

B110 Tag open-cup viscometer for determining 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: 230 V 1 ph 50 Hz 600 W.
Dimensions: 200x300x400 mm approx.
Weight: 6 kg.

B111 Tag clossed-cup viscometer, Flash Point ASTM D56 / API 509

PRESSURE AGEING VESSEL (PAV3)
EN 14769 / AASHTO R28 / ASTM D652

B112 The unit has been developed to simulate the accelerated ageing of bitumen and bituminous binders after 5 to 10 years. The sample is exposed to high pressure and temperature for 20 hours, to simulate the effect of a long time oxidative ageing by verifying the penetration and softening point characteristics.

PAV3 features include:
- Touch screen controller with front panel user interface with easy to use step-thru operation.
- Bench top unit with integral vessel/oven design.
- USB port on front unit with software upgrades and data storage.
- Remote capabilities: with APP control PAV with smart phone, tablet or IPad.
- Timer to set time and date for automatic preheat.

Construction: CE certified vertical stainless steel pressure vessel with encased band heaters and integral pressure measurement control.
Temperature is measured by Platinum RTD.

Specifications:
- Operating pressure: 2.1 +/- 0.1 Mpa
- Temperature range: 80°C to 115°C, res: 0.1°C
- Test temperature uniformity: +/- 0.5°C
- Time to return to set point temperature: less than 60 min.

The unit is supplied complete with:
10 specimen pans AASHTO T179; O-Ring; precision anodized aluminum sample rack; Hex socket wrench; specimen loading/unloading tool; single stage regulator; high pressure hose assembly; instruction manual. Power supply: 230V 1Ph 50/60Hz 10A
Dimensions: 760x460x700 mm.
Weight: 130 kg
NOTE: a source of compressed air with a pressure of at least 325 psi and a pressure regulator is required to operate the PAV3

Vacuum Degassing Oven for PAV

B112.01 For degassing pressure aged binder samples to precisely and accurately meet ASTM D6521 and AASHTO R28 Standards.
Stainless steel construction, hinged lid to conserve space and access the vacuum chamber, holds up to 4 specimen containers.
Self-contained automatic vacuum system, high precision digital display controller indicating: time, temperature, current stage of each process.
It maintains temperature up to 170°C with accuracy +/- 5°C
Power supply: 230V 1ph 50Hz.
Dimensions: 610x400x305 mm
Weight: 60 kg approx.

SAYBOLT DIGITAL VISCOMETER
ASTM D88 / UNE 7066, 51021 / AASHTO T72

B118 Saybolt viscometer 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, filter funnel, withdrawal tube **“are not included”** and must be ordered separately.
The viscometer is equipped of a dual safety thermostat to prevent accidental over-heatings.
Power supply: 230 V 1 ph 50 Hz 500 W
Dimensions: 270x270x550 mm.
Weight: 12 Kg
B118.01 Furol orifice
B118.02 Universal orifice
B118.03 Saybolt flask 60 ml capacity
V9117 Thermometer ASTM 17C (+19 º to +27 º C) x 0.1 ° C
V9118 Thermometer ASTM 17C (+34 º to +42 º C) x 0.1 ° C
V9119 Thermometer ASTM 17C (+49 º to +57 º C) x 0.1 ° C
V9120 Thermometer ASTM 17C (+57 º to +65 º C) x 0.1 ° C
V9121 Thermometer ASTM 17C (+79 º to +87 º C) x 0.1 ° C
V9122 Thermometer ASTM 17C (+95 º to +103 º C) x 0.1 ° C

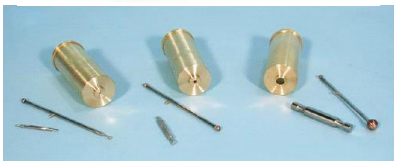
TWO TUBE SAYBOLT VISCOMETER

B119 Saybolt viscometer with digital Basically structured as mod. B087 but with two tubes.
Supplied complete except thermometers, filter funnel and withdrawal tube.
Power supply: 220 - 240V 50 Hz, 500 W.
Dimensions: 270 x 270 x 550 mm.
Weight: 16 kg

PENSKY-MARTENS DIGITAL FLASH POINT TESTER
EN 22719 / ASTM D93 / AASHTO T73 / IP 34, 35 / ISO 2719

B120 Used for the determination of the flash point of petroleum products by the Closed Cup Test, with a Flash Point between 40°C to 360°C.
Supplied complete with stirrer, shield for radiations, cast iron bath, electric heater with digital thermoregulator two thermometers ASTM 9C -5 + 110°C div. 0,5 C, and ASTM 10C +90 +370°C div. 2°C.
The stirrer allows to perform both "A" and "B" methods.
The tester is equipped of a gas flame feeder.
Power supply: 230 V 1 ph 50 Hz 600 W.
Weight: 10 kg

EFFLUX VISCOMETER STANDARD TAR (BRTA, REDWOOD)
EN 12846 / EN 12846-02 / En 13357 / IP 184 / NF T66-005 / BS 2000
B125 Used to determine the viscosity of cut-back bitumen and road oil.
The instrument consists of a stainless steel bath (tank), agitator, rheostat, immersion electric heater with digital thermostat to take the water to the desired temperature, cooling coil for water supply connection.
The viscometer is equipped of a dual safety thermostat to prevent accidental over-temperatures.
Supplied with control glass thermometer IP 8C, range 0 - 45°C., subd. 0,2°C., graduated glass cylinder 100ml capacity.
Supplied **"without"** Cup, Go/not go gauge, ball valve to be ordered separately (see accessories).
Power supply: 230V 50/60Hz 1ph 300W
Dimensions: 265 x 270 x 550 mm.
Weight: 12 kg



B126 TWO PLACES STANDARD TAR (BRTA, REDWOOD) DIGITAL VISCOMETER

Accessories:
Standard: EN, NF, IP
B126.01 Go/not go gauge for dia. 4 mm orifice
B126.02 Cup with orifice dia. 4 mm.
B126.03 Ball valve dia. 4 mm.

Standard: EN, NF, IP, BS
B126.04 Go/not go gauge for dia. 10 mm orifice
B126.05 Cup with orifice dia. 10 mm
B126.06 Ball valve dia. 10 mm.

Standard: EN 12846
B126.07 Go/not go gauge for dia. 2 mm orifice
B126.08 Cup with orifice dia. 2 mm..
B126.09 Ball valve dia. 2 mm.

EN 12847/ NLT 140/ IP 485
SEDIMENTATION OF BITUMINOUS EMULSIONS
B127 The glass tube has 41,5 mm inside dia. by 115 mm height, and a fused-on glass filter with holes size between 0,160 and 0,250 mm is fitted.
Weight: 300 g approx.

ENGLER DIGITAL VISCOMETER
ASTM D940, D1665 / AASHTO T54 / BS 2000 / NF T66-020 / CNR Nº102

B128 Engler viscometer to use 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. The viscometer is equipped of a dual safety thermostat to
prevent accidental over-temperatures.
Power supply: 230 V 1 ph 50 Hz 300 W
Dimensions: 265x270x550 mm.
Weight: 12 kg

B129 Engler digital viscometer Two elements
Basically structured as mod B128 but having “Two elements”, electrically operated, supplied complete. Weight: 20 Kg.

Common accessories:
V9123 Thermometer ASTM 23C rang +18 +28ºC.
V9124 Thermometer ASTM 24C rang +39 +59ºC.
V9125 Thermometer ASTM 25C rang +95 + 105ºC.
B326.01 Kohlraush calibration flask 200 ml capacity
B129.01 Engler testing flask
B129.02 Graduated cylinder, glass with spout, cap. 25 ml. Hexagonal base.
B129.03 Graduated cylinder, glass with spout, cap. 100 ml. Hexagonal base.

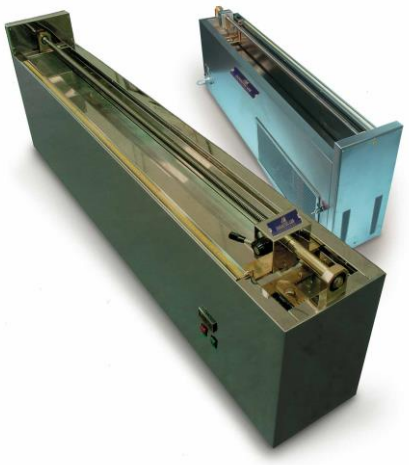
BROOKFIELD VISCOMETER
UNE EN 13302 / ASTM D3205, 4402 / CENTC 19

B130 Programmable digital rotational viscometer to determine the viscosity of bitumen. The machine operates by rotating a cylinder or spindle which is immersed in the material analyzed by measuring the resistance of this substance at a selected speed. The resulting resistance or torque flow is a measure of viscosity, depending on the velocity and characteristics of the spindle according to rule. The team has a record of research and development PC. Assays easily automated with Rheocalc software Wingather or for subsequent analysis. Sensor and display on screen in continuous time function controlled trials countdown clock. The display shows the torque calculation of viscosity (cPs or mPas), temperature% torque (Torque or scale Brookfield), and spindle speed in use. Choose from 54 different speeds. Displaying the maximum measurable viscosity for each spindle-speed combination.
Resolution:
Measuring range: 100-40.000.000 cP or mPa
Repeatability: 0.2%
Accuracy: ± 1% of range
Power supply: 220 V, 50 Hz

DUCTILITY AND BREAKPOINT
UNE EN 13589, 13398 / AASHTO T51 / ASTM D113 / NFT66-006 / CNR Nº 44
B122 Ductilómetro to determine the elongation of a bituminous specimen, 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. Water bath temperature is maintaned constant at 25°C ± 0,5°C. by a digital thermoregulator. The unit is equipped of a dual safety thermostat to prevent accidental over-temperatures.
Max. traction force: 300 N, accuracy: ± 0,1 N
The ductilometer can accept up to 3 specimens simultaneously.
Supplied complete "**except**" for the briquette mould and base plate that must be ordered separately (see accessories).
Power supply: 230V 1 ph 50 Hz 1000 W
Dimensions: 2140x350x400 mm Weight: 95 kg

Accessories:
B122.01 Used to prepare the specimen, it is brass made, accurately machined. StandardS ASTM and AASHTO Supplied without base plate. Weight: 300 g.
B122.02 Base plate for ductility mould
B122.04 Ductility briquete mould standard EN 13398. Used to prepare the specimen, it is brass made, accurately machined. Supplied without base plate. Weight: 300 g
B122.05 Ductility briquete mould Standard EN 13589. Used to prepare the specimen, it is brass made, accurately machined. Supplied without base plate. Weight: 300 g

B123 Ductilometer with cooling system. Same as for mod. B122 but equipped with incorporated refrigerating unit for tests with water temperature from + 5° to + 25°C.
Dimensions: 2140x350x750 mm. Weight: 130 kg
B122.10 Ductilometer with data acquisition system Technical and mechanical specifications: same to mod. B122, but upgraded with:
- Evolution data acquisition and processing system, "colour touch screen display" 1/4 VGA, 24 bit resolution. It automatically performs data acquisition and processing. Directly connected to printer (accessory) via USB it prints the test certificate. Equipped with slots for external pendrive or SD card infinite memory support with direct connection to PC.
- One electric load cell 50 N capacity complete with installation and calibration. (Possibility to install up to 3 cells). Supplied "**without**" briquette mould and base (see accessories).
B122.15 Load cell electric, 50 N capacity, complete with installation and calibration (possibility to install up to 3 cells).
B122.16 Refrigerating unit, incorporated into the machine, for tests with water temperature from +5°C to +25°C.



B122/B123

B122.10

ASPHALT SAMPLES VACUUM DRYING DEVICE
ASTM D7227 / AASHTO PP75

The device is a vacuum drying device specifically designed for rapid drying of compacted asphalt cores and samples. The quick and accurate dry weight, helps contractors determine pavement density close to real time and make adjustments to rolling pattern and material if necessary.
It can also provide a matching baseline for density comparison between contractors and agencies.
The device dries specimens near room temperature, ensuring sample integrity and the most accurate & repeatable dry weight. Rapid moisture loss is attributed to electronic desiccation and high vacuum technologies.
The system cycles a flow of ambient air and vacuum, ensuring a highly efficient moisture removal process.
The state-of-the-art and patented thermoelectric cold trap is specifically designed to protect the vacuum pump from damage by capturing moisture extracted from the sample.
Vacuum Pump: 1 HP
Power supply: 230V 1ph 50Hz 1650W
Dimensions: 810x600x880 mm
Weight: 77 kg

BBR – BENDING BEAM RHEOMETER
AASHTO T313 / ASTM D6648

B130 Bending Beam Rheometer is engineered to perform flexural tests on asphalt binder and similar specimens. These tests consist of a constant force being applied to a specimen in a chilled bath in order to derive specific rates of deformation at various temperatures.
TEST FRAME:
- Three-point bend test apparatus
- Integral stainless steel frictionless construction
- Load cell 500 g with mechanical overload protection
- Linear Variable Displacement Transducer (LVDT) 0.25 in (6,35 mm)
- Two independent platinum RTD for precise temperature control
- Liquid bath:
stainless steel construction
temperature range: -40 to 25°C
mechanical refrigeration system
cooling coil located within the test bath
no pumping required. Cools Ethylene Glycol - water - methanol mix (recommended for safety) to -40°C.
- Compressed air: 0.34 MPa clean, dry air supply required
- CE certified model
SOFTWARE:
- Control, acquisition and analysis software
- BBR Software version 4.16W
- Computer interface card
- Menu driven program, mouse compatible
- Daily calibration routines
- Displays and graphs real time load, displacement and bath temperature
The BBR System includes: complete calibration kit with carrying case, 5 specimen molds with accessories, PC, accessories.
Power supply: 230V 1ph 50/60Hz
Weight: 110 kg approx.

PARTICLE CHARGE TESTER
B134 Apparatus for determining the particle charge in bitumen emulsions.
The equipment comprises:
Miliammeter scale up to 12V DC. On support base
Variable-resistance
Two stainless steel electrodes
Insulating device
Dimensions: 140x200x270 mm.
Power supply: 230V, 50 Hz.
Weight: 2,200 kg

COHESION TESTER
UNE EN 12274-4 / ASTM D3910
B135 This instrument is used for cohesion tests on the mix, and to determine the proper consistency or mix design for a slurry seal mixture.
The pneumatic cylinder incorporated into the unit applies a pressure to the sample. A hand torque tester supplied with the cohesion tunit, measures the torquing strength by determining the complete solidification of the mix.
Supplied complete with 5 moulds dia. 60 x h 6 mm, 5 moulds dia. 60 x h 10 mm, accessories, spare parts.
To perform the test an air pressure source is needed.
Dimensions: 400x250x300 mm approx.
Weight: 20 kg approx

ACCESSORIES:
B045.11 Air Compressor. 230V, 50Hz 1 ph.
Square mould with 4 holes to prepare the sample:
B135.12 Mould 140x140x6,3 mm
B135.13 Mould 140x140x10 mm
B135.14 Mould 200x200x13 mm
B135.15 Mould 200x200x19 mm

SPARE PARTS:
B135.16 Mould dia 60xh6 mm (5 pieces)
B135.17 Mould dia 60xh10 mm (5 pieces)

SAND PATCH EQUIPMENT
EN 13036-1 / ASTM E965 / CNR N. 94 / NF P98 216-1
B136 Road and airfield surface characteristics.
Measurement of pavement surface to determine the average macrotexture depth using a volumetric patch technique.
The equipment comprises:
- Spreader disc with handle and rubber coated surface.
- Wind shield
- Soft and wire brushes.
- Screw-adjusted compass 300 mm graduated rule.
- Metallic cylinder for spheres volume measurement.
- Two glass pyknometers with metallic screw top and pouring hole
- Three graduated cylinders 10, 25 and 50 ml cap.
- Knee-guard
- Carrying case

Weight. 4 kg approx.

V215

V218

V217

V215 Thermometer with digital display, ranges -50 º to 250 º C. With 200 mm rod to puncture. Resolution 0.1 º C to -19.9 º C to 150 º C., rest 1 º C.
V216 Thermometer with digital display, ranges -40 to 200 ° C. With 180 mm rod to puncture. Movable head. Resolution 0.1 º C to -19.9 º C to 150 º C., rest 1 º C.
V217 Thermometer with digital display, ranges -50 º to 150 º C. With 110 mm probe to puncture.

V218 Thermometer with digital display, for temperatures from -50 ° to +1000 ° C. Possibility of connecting 2 sensors, resolution 0.1 ° C. up 199.9 ° C, remaining 1 º C.
Accessories:
V219 Probe immersion / penetratio
V220 Surface Probe
V218.01 Protective cover

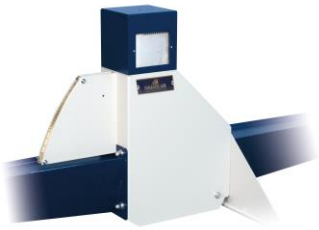
C078 Corer probe electric aluminum double column of 580 mm. of stroke, feed per worm gear, with foot balance column and bolts and bearings for drilling at angles. Equipped with electric geared motor three speeds, drill from 50-205 mm diameter.
Power supply: 220-240V, 50 Hz
Weight: 100 kg approx.

Accessories:
C078.01 Diamond Crown Ø 50 mm.
C078.02 Diamond Crown Ø 75 mm.
C078.03 Diamond Crown Ø 100 mm.
C078.04 Diamond Crown Ø 150 mm.

C079 Core drilling machines “high performance”
This rugged, compact and por table 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.
C079.02 Pavement core drilling machine 12,5HP 4-stroke petrol engine, Same to mod. C319, but activated by a petrol engine 12,5 HP power 4-stroke Briggs & Stratton model.
Weight: 150 Kg

TEST PAVEMENT
UNE EN 13036-7
B137 Mobile ruler approximately 3 m long to measure road irregularities. Manufactured from aluminium alloy. Two graduated wedges are used together.

Accessories:
B137.01 Graduated wedge



TRAVELLING BEAM DEVICE
B138 Used to detect and check any irregularity in both bituminous and concrete road surfaces. The unit consists essentially of a 3 metre long beam fixed on two rigid wheels at the extremities. In the middle of the beam a sensing unit comprising a wheel connected to an indicator provides a magnification of 4:1 and measures deviations of the surface. The deviations are shown on a scale calibrated in increments of 2 mm up to 10 mm and 5 mm up to 25 mm. The beam is supplied as three sub-assemblies which are quickly assembled on site.
Weight: 55 kg approx.

B138.02 Pack of 10 chart rolls for approx. 1000 metre run
B138.03 Pen nibs (10 units).
Accessories:
B138.01 When connected to the Travelling Beam Device mod. B138, it provides a permanent record of the surface profile. It records up to 1000 metre surface on the special chart paper rolls.Supplied complete with 10 chart rolls and 2 fibre-tipped pens.

AASHOT T256-77
B139 Benkelman beam to measure elastic flexible surface under the action of the load. The beam is positioned between the wheels of the vehicle and in contact with the pavement. Flexibility is measured when the vehicle passes over the test area. Made of lightweight aluminum. Beam length 2440 mm. and extension of 1220 mm.
Weight: 15 kg

B140

B140 Calibration device with analog gauge to Benkelman beam

B139

LOAD BEARING PLATE
UNE 103.308 / NLT-357/98 / UNE 7391 / ASTM D1194, D1195, D1196 / BS 1377-9
S170 Assay plate 200 KN load capacity, to determine the load capacity of a soil in static load conditions and for use together with the Benkelman beam. The team consists of the following elements:
• 1 300 mm plate. Ø, surface plate 700 mm2.
• 1 plate Ø 600 mm.
• 1 Piston 20 Tm. and 100 mm. route.
• 1 manual piston pump.
• 1 pressure hose 3 m. Quick plug
• 3 Magnetic media for holding the comparator
• comparators 3 30 x 0.01 mm.
• 1 swivel coupling
• Reference 1 Bridge. (tripod)
• Cases
S171 Load cell capacity of 200 KN and engageable in the module plate with display and buttons of force membrane (TM or KN) pressure (Kg / cm ² or mPa) and button size of the plates 300, 600 and 762 mm. has reset button. Direct reading and rechargeable
S172 Module 4 channel control with display and membrane buttons for strength (TM or KN), pressure (Kg / cm ² or MPa) and deformation to the plates 300, 600 and 762 mm. has reset button, memory, rechargeable battery and direct reading
S173 plate Ø 762 mm. for load plate with handles
S174 Square plate300 mm. load plate according to UNE 7391
V361 Digital Comparator 0-30 mm capacity and resolution 0.01 mm.
V360 Digital Comparator 0 to 12.5 mm capacity and resolution 0.01 mm. with data output
S175 Potentiometric sensor tip 25 mm and spring
S170.05 ENAC officially certified calibration for the load cell load plate.

MUFFLE FURNACE HIGH TEMPERATURE

Muffle furnace up to 1800 ° C. PAD execution allows for the control and automatic regulation of the temperature by means of a pyrometer connected to the digital-type automatic regulator.
This model is designed with the most advanced technical fiber types and elements calorification insulating current market, allowing you to get a very high temperature scale in remarkably short time. Fiber plates which form the sides and roof of the chamber are supported and are anchored on dual chamber ceramic refractory plates of the same type as the sill plate.
Uniformity ± 5%. Stability ± 2 º C.
External insulation for double chamber with forced air circulation.
Scheduler ramps 4 programs 15 segments.
Automatic digital pyrometer. microprocessor, ↗

Alarm, PID parameters. Nonvolatile memory.
Manufactured under EEC standards.
Security alarm on temperature.

CODE	Interior Dimensions mm H x W x D	External dimensions mm H x W x D	Maximum temperature º C	Power Kw	Power supply
V340	100 x 140 x 154	600 x 550 x 600	1350	4	220
V341	140 x 170 x 300	700 x 700 x 800	1375	6	220
V342	140 x 170 x 300	700 x 700 x 800	1450	7	220
V343	120 x 175 x 250	650 x 950 x 700	1450	6	220
V344	100 x 130 x 250	650 x 950 x 700	1525	7	220
V345	100 x 130 x 250	650 x 950 x 700	1650	6	220
V346	250 x 250 x 260	650 x 1000 x 800	1650	10	220
V347	150 x 150 x 150	800 x 550 x 600	1650	5	220
V348	150 x 150 x 150	800 x 550 x 600	1700	6	220
V349	250 x 250 x 260	1000 x 600 x 700	1700	10	220
V350	150 x 150 x 150	800 x 550 x 600	1800	6	220
V351	250 x 250 x 260	1000 x 600 x 700	1800	10	220
V352	400 x 400 x 400	2100 x 850 x 1000	1600-1700-1800	30	380III
V353	450 x 450 x 450	2150 x 1000 x 1200	1600-1700-1800	40	380III
V354	600 x 600 x 600	2100 x 900 x 1400	1600-1700-1800	50	380 III

MUFFLE FURNACE AT 1200 ° C.

Muffle furnace up to 1200 ° C. allows for the control and automatic regulation of the temperature by a pyrometer connected to the digital-type automatic regulator.
Microprocessor control system for programming functions and temperature ramps at different times,
Manufactured under CE standards.
Safety switch
Security alarm.
Type K Thermocouple

1200ºC

Referencia	V355	V356	V357
Chamber Interior: H x W x D	100 mm 150 mm 200 mm.	150 mm 200 mm 300 mm	200 mm 280 mm 400 mm
External Dimensions: H x W x D	505 mm 460 mm 560 mm	700 mm 550 mm 800 mm	750 mm 600 mm 900 mm
Power supply	220 V	220 V	220 V

GROUP I&S

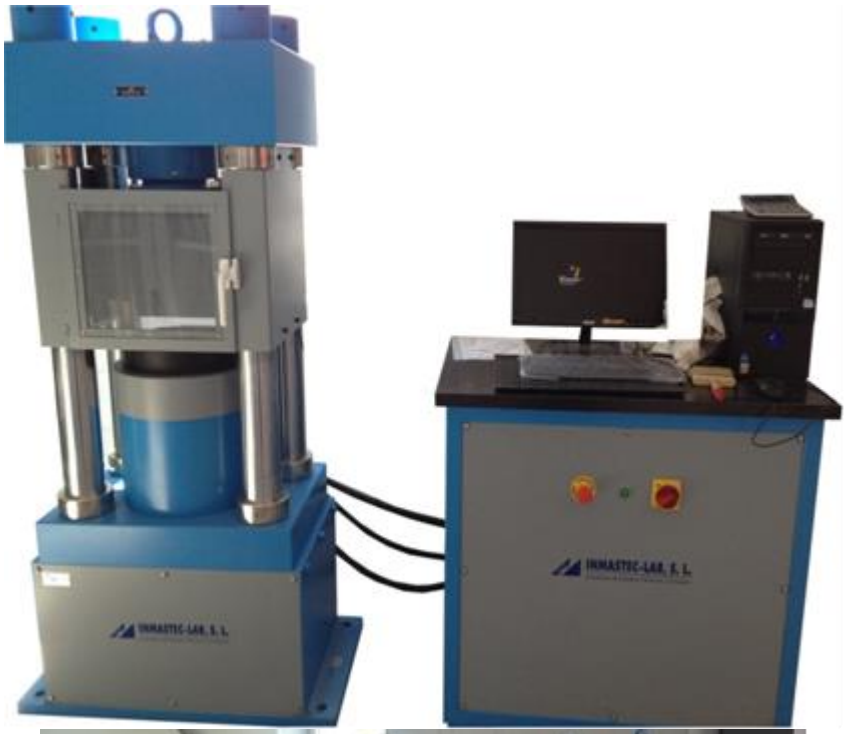
Concretes

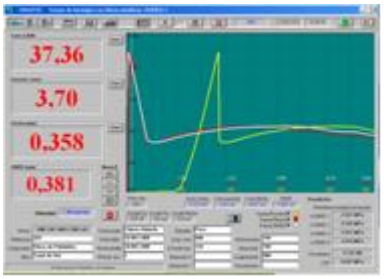
GROUP I&S

GROUP I&S 

ROLL-A-METER KIT
Standard test method for determining air content of fresh concrete by the volumetric method
ASTM C173 / AASHTO T 196
C022 The accuracy of Roll-a-Meter results is not dependent on the correctness of all these factors, but gives directly the percent air in the sample. It is unnecessary to know anything about the weight or physical characteristics of the ingredients which are supposed to be in the mix.
In contrast to other methods commonly used to determine the percentage
of entrained air, this method is unaffected by changes in water cement ratio, sand cement ratio, sand to gravel ratios, inaccuracies of specific gravity
determinations, and uncertainties as to absorbed or free water content of
the aggregates used in the mix.
The use of the Roll-a-Meter has eliminated practically all of the above listed work, together with the arduous computations and uncertainties Involved.
Even the extremely accurate measurement of the sample to be tested is
not as important with this new meter, as the resulting error would be only about 1/20 as great in using the meter as the same error would be when
using other methods or meters. Only a small percentage of the original error
is involved in the air-meter result.
Used as a pycnometer, the Roll-a-Meter has been found to be excellent for other tests, such as determination of specific gravities of cement, sand, gravel and admixtures, and for quickly obtaining the percentage of free water in damp sand and gravel.
Manufactured entirely of aluminum with transparent window graduate 0-9%. Supplied complete with screw cap, funnel to pour water, tamping rod, measuring container, screed and carrying case.
Container capacity: 2,125 ml

GROUP I&S




37,36
3,70
0,358
0,381

SLUMP CONE TEST SET
EN-12350-2/ UNE-83.313/ ASTM C143/ BS 1881:102/ NF P18-305, P18-451
C001.01 Slump cone built in chromed steel. Base diameter 200 mm, height 100 mm and above 300 mm. Weight: 1.8 Kg
C001.02 Slump cone funnel for easy filling, of aluminum
C001.03 Tamping rod galvanied Steel, dia 16x600 mm
C001.04 Galvanized steel base plate 500x500 mm. with handle
C001.05 Stainless steel Scoop curved
C001.06 Stainless Steel rule, 500 mm long

FLOW TEST
EN 12350-2
C003 Plate, galvanized steel made, dimensions 905 x 905 mm, with engraved two circles having 200 and 500 mm diameter and centrale X cross.
.
C001.01 Slump cone made of galvanized steel. No lugs (props).
Dimensions:
Base diameter: 200 ± 3 mm.
Top diameter: 100 ± 3 mm.
Height: 300 ± 3 mm.

V-FUNNEL TEST
EN 12350-9
C005 V-FUNNEL, “stainless steel” made, having 10 litres capacity, stand mounted.
The upper edge of the funnel is smooth and reinforced, and the outflow orifice is equipped of an openable seal valve.

Dimensions: 510x400x1000 mm
Weight: 20 kg approx.

V435 digital Timer
C005.01 Rigid rule of 1000 mm.
C005.02 Polyethylene container capacity 15 l. approx.

SELF-COMPACTING CONCRETE

Self-Compacting Concrete. Description of fluidity in the presence of bars

EN 12350-10

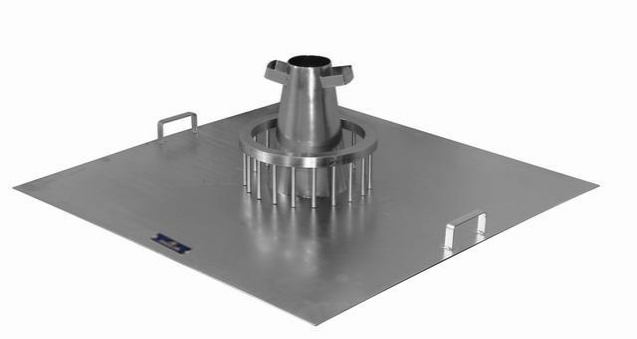
C006 "L"Box test, manufactured in stainless steel ,applicable to concrete with aggregates of 25 mm max. size. Consisting of:

-Container with inside rigid surfaces,

-Obstacle of two diferent interchangeable set of grids:

- One set of 3 vertical bar s having dia 12 mm and free light of 41 mm.
- One set of 3 vertical bar s having dia 12 mm and free light of 59 mm.
- Gate in guillotine form.
  Two mar ks far 200 and 400 mm are engraved on the horizontal bottom position.
  Dimensions:700 x 300 x 650 mm
  Weight :40 kg approx.

C006.01 Metal bar of 300 mm to level the concrete



Expansion test table

Drainage test Japanese ring (J. Ring)

EN 12350-12 /BS 1881-105 / DIN 1048

C008 Plate, galvanized steel made, dimensions 905 x 905 mm, with engraved two circles having 200 and 500 mm diameter and centrale X cross.

C001.01 Slump cone made of galvanized steel. No lugs (props).
Dimensions:
Base diameter: 200 ± 3 mm.
Top diameter: 100 ± 3 mm.
Height: 300 ± 3 mm.

C010 J. Ring for the types of tests depending on the size of the aggregates. Manufactured in stainless with diameter 300 ± 1 mm. Have a number of flat bars perpendiculars equidistant to each of 100 ± 1 mm length. the machine has 16 bars Ø12 mm maximum aggregate size less than or equal to 16 mm and the other side has 12bars Ø 16 mm maximum aggregate size greater than 16 mm.

EN-12350-3, UNE-83.314, BS-1881:104

C012 Consistometer Vebe to determine the extent or degree of consistency Vebe after subjecting the concrete to vibration. The table has a vibratory movement amplitude and fixed frequency.
The team consists of a vibrating table, cylindrical, cone, funnel, compacting rod, clear plastic disc and steel rod compaction.
Power: 220 V, 50 Hz
Dimensions: 280 x 400 x 700 mm.
Weight: 85 Kg Approx.

WALZ CONSISTOMETER
EN 12350-4/ DIN 1048
C013 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

KELLY BALL PENETROMETER
ASTM C360
C015 Consisting of a hemispherically ended cylinder with guiding frame and a handle graduated in inch, 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 laborator y.
Cadmium plated for rust protection.
Weight:15 Kg

K-SLUMP TEST
ASTM C1362
C016 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

LCL PLASTICIMETER NF P18-452
C018 The concrete workability meter (also known as plastometer) is designed to test concrete for dynamic workability. It is suitable for field and laborator y tests to check:
- Concrete mix for consistency,expecially water content
- Optimum propor tioning of concrete constituents (sand, gravel, water, cement)
- Possible improvment when admixing a plastifier
- Comparing two concrete types

The unit consists of a prismatic receiver divided into two unequal volumes by a removable par tition, and an electric vibrator. The fresh concrete is poured into the large volume space, the separating par tition is removed, and the vibrator starts automatically.
The test consists in measuring the time required for the concrete to reach an uniform distribution in the receivers
Power supply:220-240 V 1ph 50 Hz 300 W
Dimensions:820x420x410 mm
Weight:80 Kg

CONCRETE POCKET PENETROMETER

C020 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.

TIEMPO DE FRAGUADO POR PENETRACIÓN ASTM C403/ AASHTO T197/ UNE 83.311

C021 Concrete penetrometer to 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.

EN 1097-3/ UNE 7286/ ASTM C29/ C138/ BS 812, 1881/ AASHTO T19

Watertight container to determine the weight per cubic meter of fresh concrete. Made of painted steel.
C024 3 l container Capacity with handles
C025 5 l container Capacity with handles
C026 10 l container Capacity with handles
C027 14 l container Capacity with handles
C028 28 l container Capacity with handles

UNE-67.032, UNE-EN ISO 10545-5, UNE 127.007

C030 Apparatus for determining the impact resistance of concrete tiles and slabs. The apparatus consists of a heavy platform, a magnetic device that fights a ball field 1 Kg, graduated bar to adjust the height of fall and a box where you put the proper arena for settlement of the tile.
Dimensions: 800x850x1325 mm.
Weight: 60 kg approx.

Accessories:
C030.01 Steel ball 1Kg.
C030.02 Steel ball 250g.

AIR CONTENT IN FRESH CONCRETE
UNE-EN 12350-7/ ASTM C231/ BS 1881:106/ DIN 1048

C031 Air entrainment-meter, manometer method for determining the amount of air in the fresh concrete. Sealed by hooks. Consisting of 8 l tank. Capacity. Comes complete with analog gauge, manual air pump spray bottle of 1 l. Capacity.
Air content range: 0 to 10%, Div. 0.1%
Dimension: Ø250 x 450 mm.
Pressure: 2 bar
Weight: 15,300 g.

C031

C032 Air entrainment-meter 8 l. similar capacity to model C031, but with digital manometer

C033 Air entrainment-meter 5 litres capacity, water column type. 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:

C033.01 Calibration cylinder to chek and calibrate the air meter Mod. C033

C033

C034 Air entrainment meter 8 litres, electric, pressure gauge type, automatic electric air compressor giving air pressure, and keeping it constant all along the test.. This device is designed to determine the amount of air contained in the concrete. It consists of an 8 L tank, sealed with a lid with three hooks. The compression chamber inside the lid is connected to an electric mini-compressor and a loading electrovalve used to increase the pressure. Each of these components is activated by its corresponding push button. The electric mini-compressor generates pressure quickly and keeps it constant.
Volume: 8 litres.
Air contenet range: 0-10% Div. 0,1% up to 8% and 0,5% over.
Power supply: 230 V. 50/60 Hz. 1 ph
Weight: 14 Kg.

C034.01 Filing hopper for the air entrainment meters C034

TURBO FORCED MIXERS
SPECIMEN PREPARATION
EN 12390-2

Laboratory Mixers perfectly designed to homogenize concrete mixes and get a good result. The machine is built with a solid structure which is seated the engine and all the mechanical and transport carriage (from 50 l. Capacity). On a plate of appropriate dimensions, Cuba is engaged which is easily removable, even when loaded.
. Because the dimensions of Cuba, models exceeding 50 l. capacity supplied with trolley security and protection.
Power supply: 220/380 V, 50 Hz

C035 Laboratory mixer 150 liter capacity with trolley
Dimensions: 1700x950x1180 mm, Weight: 280 Kg
.
C036 Laboratory mixer 100 liter capacity with trolley
Dimensions: 830x800x900 mm, Weight: 200 Kg.

C037 Laboratory mixer 50 liter capacity
Dimensions: 780x870x800 mm, Weight: 160 Kg.

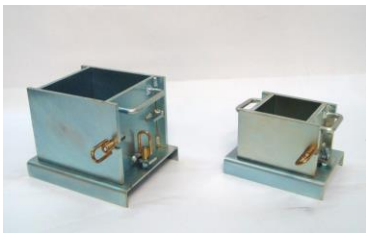
S052 Laboratory mixer 14 liter capacity
Dimensions: 700x600x650 mm, Weight:: 80 Kg.

SPLIT CYLINDER MOULDS
EN 12390-1/ EN 12390-2/ ASTM C31/ BS 1881:108/ NF 18-401

C040 Dimensions Ø50x100 mm cylindrical mould stamped steel, hinged and open
C041 Dimensions Ø75x150 mm cylindrical mould stamped steel, hinged and open
C042 Dimensions Ø100x200 mm cylindrical mould stamped steel, hinged and open
C043 Dimensions Ø150x300 mm cylindrical mould stamped steel, hinged and open
C044 Dimensions Ø160x320 mm cylindrical mould stamped steel, hinged and open

Accessories:
C001.03 Compacting rod Ø 16 x 600 mm.

Cube moulds one gang steel for concrete samples preparation, internal grinding, open and hinged, fully removabl
C045 Dimensions Cube mould of 100 x 100 x 100 mm. Weight: 10 Kg
C046 Dimensions Cube mould of 150 x 150 x 150 mm. Weight: 14 Kg
C047 Dimensions Cube mould of 200 x 200 x 200 mm. Weight: 18 Kg



Beam moulds steel for concrete samples preparation, internal grinding, fully removable
C048 Beam mould 100 x 100 x 400 mm. Weight: 20 Kg
C049 Beam mould 150 x 150 x 600 mm. Weight: 33 Kg
C050 Beam mould 150 x 150 x 750 mm. Weight: 45 Kg
C051 Beam mould 200 x 200 x 600 mm. Weight: 40 Kg

Cube mould standard, reinforced band 150 mm side for preparation of concrete specimens
C055 Cubic mould 150x150x150 mm

C057 Cube mould, 100 mm side, TWO GANGS, with "X" reinforced band on the base. The inside surfaces are very smoothed getting easier the specimen's ejection.
Weight: 1030 g approx.

EN 12390-2/ BS 1881:108
Vibrating tables for compaction of concrete specimens in laboratory. Equipped with motor-vibrator having 3000 vibrations-minute.
Power supply: 230 V. 50 Hz 1 ph

C060 Dimensions 600 x 400 x 410 mmh.
C061 Dimensions 800 x 400 x 410 mmh.
C062 Dimensions 800 x 800 x 410 mmh.

C063 Clamping device to fix moulds
C064 Separate control panel, complete with On/Off switch and timer, getting also the tables to CE Safety Directive. It can be connected only to the Laboratory Vibrating Table

C065 Poker Vibrator portable electric motor. Ideal for compacting concrete specimens. Supplied with 25mm diameter needle. and transmission hose 3 or 4 m.
Power supply: 220V, 50 Hz
Weight: 5 kg approx.

TEMPERATURE CONTROL EQUIPMENT AND MOISTURE CURED CONCRETE SPECIMENS SPECIMEN CURRING

UNE-EN 12390-2/ EN 196/ ASTM C31, C192, C511
C068 Teams of cold / heat and humidity to achieve a temperature of 20 ° ± 2 ° C. and 99% humidity until H.R
The installation involves placing two separate equipment for achieving optimal regulation inside the humid chamber. To this place a heat pump (air conditioning) and the cooling unit. The visual record humidity and temperature is done by the camera control box wet with two digital displays humidity and temperature, switch, solid state relays to cold, heat and humidity.

The humidity and temperature recording is performed by a team DATTA logger (optional) placed inside the control box.
Technical equipment:
Cooling capacity: 5,200
Heat capacity: 3,000 to 6,000 W (depending on the capacity of the chamber).
Power supply: 220/380 V50 Hz

Control panel humidity chamber

Control panel in cooler

C068.04 Software to control humidity chamber

C070 Combined PT100 Probe electronic transmitters for measuring relative humidity and temperature. Heat protection IP54.
Humidity: 0 to 100% R.H.
Temperature: 0 º to +100 º C,
Probe length: 205 mm.
The sensor element is a PT100 temperature according to DIN 43760 of high response speed

C071 Data Logger, the humidity and temperature within the chamber and see the chart of the measurement. RS 232. The apparatus is placed inside the control box. The equipment is supplied complete with software to install on your computer.

C071 Centrifugal curing room vaporizer. Used to humidify curing rooms for concrete and mortar specimens. Robust and easy to maintain. Simple installation, just an outlet and a connection to the water network or a deposit. Ideal for cold curing specimens. Produces a fine mist that facilitates rapid absorption by air, free of droplets.

Technical Features:
Spraying capacity: 1.5 l / h.
Water supply pressure: <5 K / cm ²
Power: 90 W
Power: 220V, 50 Hz
Dimensions: Ø380x500 mm.

C072 Centrifugal curing room vaporizer. Used to humidify curing rooms for concrete and mortar specimens., Robust and easy to maintain. Simple installation, just an outlet and a connection to the water network or a deposit. Ideal for cold curing specimens. Produces a fine mist that facilitates rapid absorption by air, free of droplets.

Technical Features:
Sprayability: 3 to 5 l / h.
Water supply pressure: <5 K / cm ²
Absorption Power: 90 W
Power: 220V, 50 Hz
Dimensions: Ø450x600 mm.

ELECTRONIC DATA LOGGER THERMOHYGROGRAPHS
V225 This is a "data logger" with integrated sensor and memory capacity to store up to 20,000 measured values. Built in rugged anodized aluminum housing.
Windows Software. Comes complete with integrated probe humidity / temperature, battery, magnet, instruction manual and calibration.
Humidity range: 5-100% RH
Temperature range: -10 +50 ° C.
Accuracy: ± 3% RH / ± 0.6 ° C.
Resolution: 0.1 ° RH / 0.1 ° C.
Dimensions: 131 x 68 x 72 mm.
Lithium
Weight: 320 g.

Accessories:
V225.05 Comfort software interface.
V225.01 Carrying case

ENVIRONMENTAL CHAMBER FOR THE FREEZE/THAW TEST

Frosting Test Chamber (freeze / thaw)

Construction materials installed outdoors for years bear strong climate action (in winter moisture absorption during the day and cold at night, rain, sun ...) which cause a significant degradation. With Chambers of freezing / thawing cycles manufacturers of building materials can simulate the most severe weather conditions and can afford, with precision, the severe demands placed on materials testing, optimize their products and make them more competitive.

Oscillating temperature range of -25 ° C to 30 ° C.

The team submitted complies with the technical conditions and specifications necessary to perform testing cycles of the following materials:

Bricks.
Large format bricks.
Ceramic tiles.
Tiles and fittings cement or concrete.
Ceramic tiles.
Corrugated or ribbed and fiber cement roofing complementary pieces.
Platelets and fiber cement roofing complementary pieces.
Granites.
Marble and limestone.
Slates.

Teams are composed of two independent modules; House Bunker, bath, and control desk.

Joint structure built on a Steel Tube Sheet Stainless Steel AISI 304 (18/8), polished, satin, completely sealed and seamless, painted with acrylic paint dried in the oven. Flexible silicone seal high and low temperature for the perfect interior seal door trim. The opening system is equipped with gas shocks and offset hinges (allow easy removal of the door in case of maintenance). Protection Grille Stainless Steel fans.
Automaton fault management in the indicator display system messages.
Pushbutton / Pilot unlock reset alarm equipment.
Test Requirements - Bibliography of Standards
UNE EN ISO 10545 "Ceramic Tiles"
UNE 67048 "Ceramic Blocks"
UNE 22174 "Ornamental Granites"
UNE 22184 "Marble and Limestone"↗
UNE 67028 "Bricks"
UNE 67034 "Ceramic Tiles"
UNE EN 491 "Concrete Tiles"
UNE EN 539-2, Method C "Clay roofing tiles"
UNE EN 494 "corrugated or ribbed and complementary pieces Slate Roofing"
UNE 7070 "stone pavers"

Optional elements
Pneumatic opening of the gate.
Insertion mobile probe on samples.
RS-232 output.
Defrost System.
Grommets made of PVC.
Control Software and Programming Windows ® environment.

C075 Freeze-thaw chamber of 525 l. capacity
Useful dimensions Bunker: 750x1000x700 mm
External dimensions Bunker: 1250x2800x925 mm.
External dimensions thermostatic deposit: 1980x1260x1150 mm.
Temperature range: -25 º to +30 º C.

C078 Electric Core Drilling Machine lightweight portable, aluminum double column of 580 mm. of stroke, feed per spindle Endless Column foot balance and bolts and bearings for drilling at angles. Equipped with electric geared motor three speeds, drill from 50-200 mm diameter.
Power: 220-240V, 50 Hz
Weight: 100 kg approx.

Accessories:
C078.01 Diamond Crown Ø 50 mm.
C078.02 Diamond Crown Ø 75 mm.
C078.03 Diamond Crown Ø 100 mm.
C078.04 Diamond Crown Ø 150 mm.

SPECIMEN CUTTING MACHINE
C080 Cutting concrete specimens, witnesses and construction materials. It has a screw to vary the height of the head. Comes complete with submersible pump water for cooling and blade guard.
Specifications:
Motor: 3 Hp
Power: 230/380V. 50 Hz
Cutter: Supports 300/350 - 25.4 mm ..
Carriage Dimension: 498 x 648 mm.
Maximum cutting length: 645/630

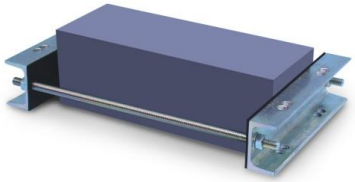
Accessories:
C080.01 Cutting Disc Ø350 mm
C080.02 Cutting Disc Ø300 mm
C081 High capacity Cutting concrete specimens for highest production, cutting block, curbs and specimens. Height adjustable head. Ability to Ø 600 mm disc.
Motor: 220/380V three phase
Power Supply: 7.5 C.V.
C081.01 Diamond disc Ø 600 mm. old concrete.

TEST ABRASION BÖHME
EN 1338 / EN 1339 / EN 1340 / 13892-3 / 14157 / DIN 52108
A168 The instrument measures a volume loss in a specimen under abrasion test and it's used in tests such as:
Paving stones, concrete slabs, slabs made of natural rocks and natural stone slabs.The test is performed by positioning a specimen to be verified in a abrasion tester Böhme apparatus on the test track on which has been spread normalized abrasive; the grinding wheel it's made rotate and the specimen submitted to the abrasive load of 294 N for a certain number of cycles. Before doing a test, establish the specimen's bulk density by measuring weight and thickness. Perform the test for 16 cycles composed of 22 turn each, calculating at the end a worn as a average loss in volume and weight. The apparatus is basically composed of:
Cast iron horizontal disc with a speed of 30 rpm and a diameter of 750mm furnished of a 200mm test track to position a specimen.
Separate control panel with digital revolutions counter with

automatic stop after preset revolutions, specimen's holder and adjustable charger used to produce a force of 294 N ± 3 N on a specimen
Power supply: 230V 50Hz 1PH 800 W
Dimension: 1500 x 1000 xh 850 mm
Weight: 250 kg
A168.01 Abrasive material, box of 25 kg

C083

C083.01



C083.04

C083.03 Set mounting brackets diameter specimens 100, 110, 150, 160 mm. can only be used in conjunction with C083.02
C083.04 Mounting set for different sized blocks to 390x250 mm.

SPECIMEN GRINDING MACHINE EN 12390-3/ ASTM D4543

C083 Specimens automatic grinding**,** designed to grind and polish concrete cube and cylinder specimens, blocks, natural stones, rocks, ceramic materials etc. The specimens are easily fixed to the table by proper locking stirrups (see accessories) allowing to grind at a time:
- N° 3 cube specimens 100mm side, or
- N° 3 cube specimens 150mm side, or
- N° 2 cube specimens 200mm side, or
- N° 2 cylinder specimens dia. 100x200, 110x220, 150x300, 160x320mm, or
- N° 1 block with max. dimensions 390x250mm

The revolving abrasive head is radially and alternatively moved in both directions through an electric motor actuated by a pushbutton.
The column is completely protected against the abrasive dust.
The vertical lowering of the grinding head is achieved with infinitesimal adjustments by operating on the top handwheel having 0,05mm graduations.
The machine, made from rugged plate, is supplied complete with control panel, coolant/decantation tank (by water and emulsifying oil), motor pump, set of abrasive sectors, safety chip guard that when removed, stops automatically the machine.
The standard supply "**does not include**":
- The locking stirrups,
- The diamond sectors (8 pieces)

that must be ordered separately (see accessories).

Technical specifications:
Table dimensions: 775x280mm (useful: 750x235mm)
Grinding wheel dia.: 330mm
Vertical span width: min. 175mm (95mm with the distance piece) max. 380mm
Grinding height range: 95 ÷ 380mm
Grinding head stroke: 215mm
Grinding wheel speed: 1400 rpm.
Power supply: 400V 3ph 50Hz 4500W
Dimensions: 1220x1080x (h) 1730mm
Weight: 410 kg approx.

Accessories:
C083.01 Diamond polishing sections (8 units required), especially effective due to their long working life and good grinding action.
C083.02 Set cubic specimen mounting brackets 100, 150, 200 mm.

UNE EN 12390-3/ ASTM C617, C31, C192/ NF P18-416/ BS 1881/ AASHTO T23, T126

C085 Electric melting pot, capacity 5 l. double security camera with built-in thermostat, double resistance located around the perimeter of the inner pot, designed to prepare the paste of sulfur used in the facing concrete specimens.
Temperature control: from 50 º to 300 º C.
Supply 220 V., 50 Hz
Weight: 15 kg Approx.

Accessories:
C086 Micronized sulfur powder, 25 kg pack.
C087 Carbon black, pack of 12 kg Approx.
C085.01 Stainless steel ladle to transfer sulphur

C088 Cylinder capping equipment EN 12390-3/ ASTM C617, C31, C192/ AASHTO T23/ for dia.
150 x 300 mm. With chrome plate.
C089 Refrentador for cylindrical specimens
Ø 100 x 200 mm. With chrome plate.
C090 Refrentador for cylindrical specimens
Ø 75 x 150 mm. With chrome plate.

H088/89/90/91/92/93

C091 Cylinder capping for specimens Ø 150 x 300 mm with rectified plate and cemented.
C092 Cylinder capping for specimens Ø 100 x 200 mm with rectified plate and cemented.
C093 Cylinder capping for specimens Ø 75 x 150 mm with rectified plate and cemented.

C094 Cylinder capping two columns with height-adjustable rollers for cylindrical specimens
Ø 150 x 300 mm.
C095 Cylinder capping two columns with height-adjustable rollers for cylindrical specimens
Ø 100 x 200 mm.
C096 Cylinder capping r two columns with height-adjustable rollers for cylindrical specimens
Ø 75 x 150 mm.

WATER IMPERMEABILITY TESTER AND ABSORPTION IN CONCRETE
UNE EN 12390-8/ EN 12364/ ISO 7031/ DIN 1048

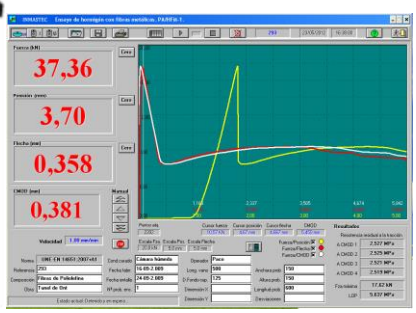
Equipment for determining depth of penetration of the water under pressure according to the standard specifications, by the surface application of water at a controlled pressure on specimens of known dimensions, then measuring the water penetrated into the specimen. The test rig consists of stainless steel devices for placing Ø100 cylindrical specimens, 75 and 150 mm. or 100 and 150 cubic mm side, with the following design characteristics:
- Clamping plate made of stainless steel
- Gasket, to maintain tightness test positions
- Fixing system of the specimen height adjustable by threaded rods in stainless steel to ensure a perfect fit of the specimen in the test bench.
- Water collector, built in stainless steel.
- Remote control for each test unit
- Check valve 2 position
- Circuits for test positions by means of adjustment of a regulating valve and a pressure gauge accuracy.

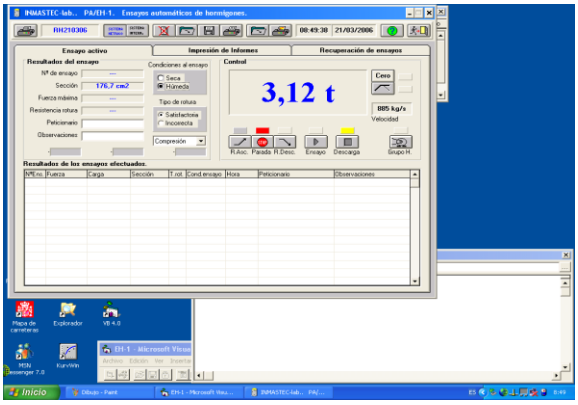
Supplied complete as described, with seal for cylindrical specimens Ø 150, 100 and 75 mm. The compressor must be ordered separately.

C100 Air compressor maximum 10 bar and 8 bar constant pressure
Power supply: 220V, 50 Hz
Weight: 25 kg approx.

C098 **E**quipment for the water penetration test of three positions.
Dimensions: 1300 x 900 x 600 mm.
Power supply 220 V, 50 Hz `
Weight: 100 kg approx.
C099 Equipment for water penetration test of 6 posts.
Dimensions: 1800 x 900 x 1000 mm
Power supply: 220V, 50 Hz
Weight: 150 kg approx.

COMPRESSION TESTING MACHINES AND BENDING CONCRETE SPECIMENS
UNE EN 12390-3, 12390-4/ BS 1881:115/ DIN 51220, 51223, 51302/ ASTM C39, E4/ AASHTO T22, T71





COMPRESSION TESTTING, AUTOMATIC COMPACT SERVO-CONTROLLED COMPRESSION TESTS MANAGED TO MICROPROCESSOR AND GOVERNED BY LAST COMPUTER GENERATION, STANDARD EN 12390/ EN 772-1/ UNE 67037/99/ EN 1340/ ASTM C42/ BS 1881/ NF P18-407/ ASSHTO T97

Compact presses, hydraulic built in class 0.5 designed to meet the demands of any compression test on concrete specimens, with accuracy better than ± 1% in compliance with European and international standards.
The features of this series are: robustness, measurement accuracy, easy handling, comfort to carry, and compliance with current regulations.
A rigid structure, through the four columns chrome frame, ensures a perfect repeatability and accuracy of the test results.
The set consists of: Area frame compression tests and where you install the hydraulic and the measurement and control system.

TESTING AREA

Comprised of a compact set of four columns of high mechanical stability and great aesthetics.
The lower bed receives the assembly formed by the sleeve with its piston, the upper bridge serves as closure of the test frame. The compression plates are hardened and ground and built in high strength steel, the bottom is marked concentric, very helpful for correct positioning of the samples, while the upper ball joint includes a system that allows for perfect fitting.
The team can perform tests on the following types of samples:
* Concrete specimens: cylindrical, cubic, prismatic, indirect tensile, etc.
* Drive-Brazilian indirect (Optional device)
* Paving stone and concrete.
* Rocks and granites.

C111/114/117/120

CENTRAL HYDRAULIC SERVO

Mounted on anti-vibration system, houses the high pressure hydraulic power, with tight fitting, pollution control, and very low noise. Powered by a microprocessor hydraulic operated and governed by computer.
The servo is controlled by the module with RS 232.
The hydraulic cylinder with an O-ring in the groove and piston are made of special steel rectified.

MEASUREMENT AND CONTROL SYSTEM USING MODULE (Automatic)

The control module is a microprocessor-operated electronic device that performs servo control of the test machine closed-loop digital form via an external personal computer. The high speed of the computer, allows you to make very precise control of the actuator of the testing machine and digital filtering allows maintaining high resolution and stability in the signs of the variables of reading.
The module is mounted in a metal housing of reduced dimensions located within the frame of the testing machine. All necessary control and display is performed via a computer program working under Windows interface.
The personal computer required for such monitoring must meet the requirements under Windows, so in general, will be a last generation computer.
Servo-controlled compression machines for compression tests on cylindrical specimens Ø 15 x 30, 16 x 32 cms. And up to 200 cubic mm. hand, prismatic (optional supplementary dishes) and indirect tensile test (Brazilian Device option). Ruled by computer.
Supplied with the latest computer flat screen, computer table (optional), safety shield with auto door opener for test area Software CD overall test program and instruction manual in English.

C108N DIGITEC
C098N AUTOTEC

Two-channels computerised graphic display system to control and manage all sorts of automatic (Autotec C108N) and semi-automatic (Gigitec C108N)testing machines, for acquisition, display, processing, printing and saving the test data and certificates, with software for remote control from PC.

TO UPGRADE OR COMPLETE YOUR CONCRETE OR MORTAR COMPRESSION AND FLEXURE TESTING MACHINE (also from other manufacturers).
The system can manage and process the data in compliance with EN 12390 Specification and the different International Standards, for the following tests:
• Compression on concrete
• Flexure on concrete
• Splitting on concrete cubes and cylinders
• Compression and flexure on mortar
• C127N On board graphic printer
• RS232 connection with remote control to PC

Specifications: Digitec / Autotec

- 2 analogue-digital channels connectable to two different compression/flexure frames.
- Simple and immediate set up of the parameters and test execution, menu driven. The use does not require specialised staff.
- Continue load display.
- Breaking load detection.
- Automatic elaboration of the specific resistance value.
- Permanent file up to 1000 tests and file of 100 different types of specimens.
- Graphic display with high resolution: 192x64 pixels.
- Selectable measuring force: kN, lb
- Languages: English, French, German, Spanish, Italian, Polish, Czech, Turkish.
- Class: 0,5% starting from 10% of maximum value, on request from 1% of maximum value.

Test Setup

Test execution with pace rate controller

Technical structure

- Acquisition and data processing system at 24 bit, effective resolution: 17 bit
- Operator interface composed by 5 multi-functions pushbuttons; function icons shown on the display.
- The two analogue-digital channels accept sensors, transducers or load cells at 2mV/V
- Automatic linearity guided algorithm with very high granted accuracy (Class 0,5)
- Different programmable safety devices for the machine or the specimen as the possibility to introduce a percentage of the maximum value reached during the text execution, thermal protection of the motor and different other settable alarms.
- The firmware contains a memory of the most used specimens: area, weight, specific weight.
- Possibility of personalisation for special sized samples.
- RS232 interface: it allows transferring the data during the test or the test results directly to PC (via Microsoft Hyperterminal) or the remote control of the system by the UTM2 software (accessory)

Menu

The display shows date and time, currently applied load and single load, latest effected tests, pace rate control, rapid commands functions, configuration in use, analogue channel and activated alarm.
Power supply: 230V 1ph 50/60Hz
Dimensions: 230x145x240mm
Weight: 4 kg

Max load alarm setting

Channel configuration/calibration

Functions icons (test selection, file, alarms visualisation)

C112N CYBER-PLUS
C124N SERVO-PLUS
Designed with the latest technology, an innovative PC-like Touch Screen system employed to control and manages all sorts of automatic testing machines.
To update or complete your compression and flexural testing machine on concrete and mortar (also from other manufacturers).
The system can manage and process the following tests:

C124N Servo-Plus Evolution
8 channel sevo controlled unit for a fully automatic execution of the test. The machine comprises.

- Cyber-Plus Evolution C 112N data acquisition system
- Multi-piston electric pump with variable flow (see mod 124N) driven by a microprocessor (reliable and noiseless system, also for intensive and extended use)
- Power supply: 230V 1 ph 50 Hz 750W
- Dimensions: 420x290x1120 mm Weight: 60 Kg.

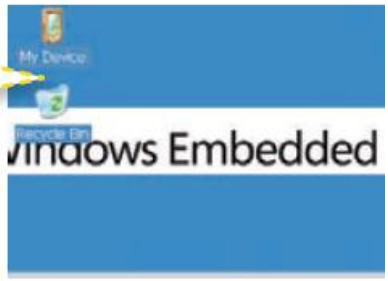
C112N Ciber-Plus Evolution
Cyber-Plus Evolution
8 channel unit for data acquisition and elaboration.
Power Supply: 230V 1F 50/60Hz 70W
Dimensions: 245x55x260mm
Weight: 5 kg

Main features:
The control unit Cyber/Servo Plus Evolution tuns like a standard PC based on Windows operating system.
The touch-screen graphical icon interface allows easy set up of the parameters and immediate execution of the test.
High resolution color display ¼ VGA, offers all the functions of a PC for the management and analysis of the data, test results, and graphs.

Direct connection of the Cyber/Servo Plus Evolution to the intranet (direct connection to a LAN network) and internet to establish a remote communication and receive a diagnostic analysis of a potential problem, the ability to excecute the test from distance, and to provide updates os the software.
Group Inmastec technicians will check the unit located abroad to guarantee a prompt and professional assistance.

Acceso directo a Internet para conexión de asistencia a distancia

Sistema operativo Windows parecido a un ordenador estándar.
Pantalla táctil a color, ¼ VGA



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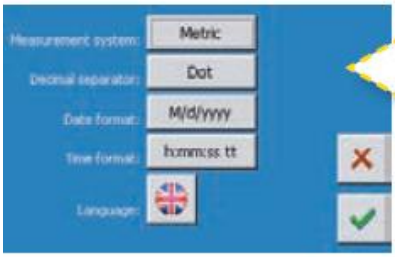
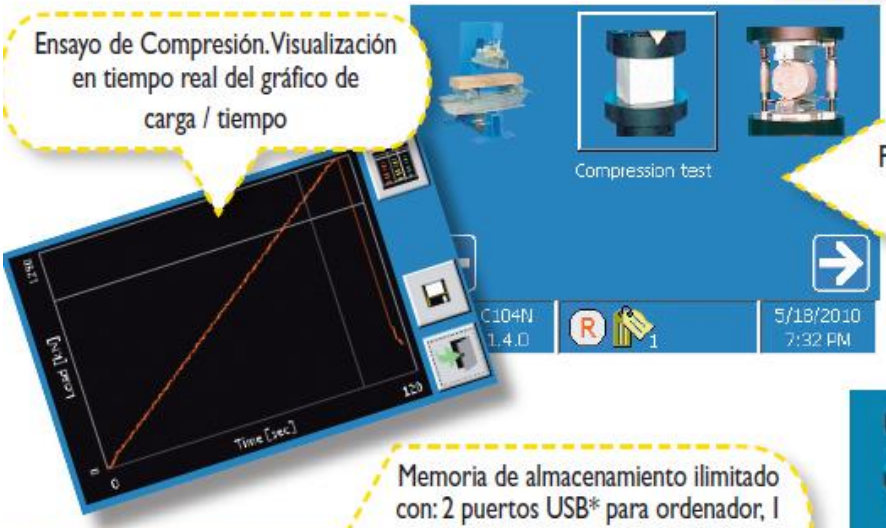
Pantalla táctil con teclado virtual alfanumérico (qwerty), fácil de utilizar

Opciones internacionales e ilimitadas de selección del idioma



Panel direccional tradicional con 5 teclas para un uso estándar o con guantes

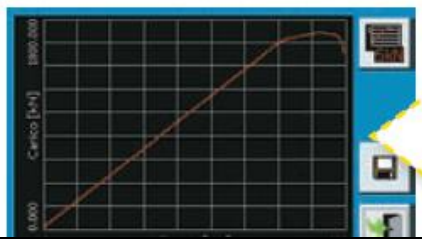
Ensayo de Compresión. Visualización en tiempo real del gráfico de carga / tiempo



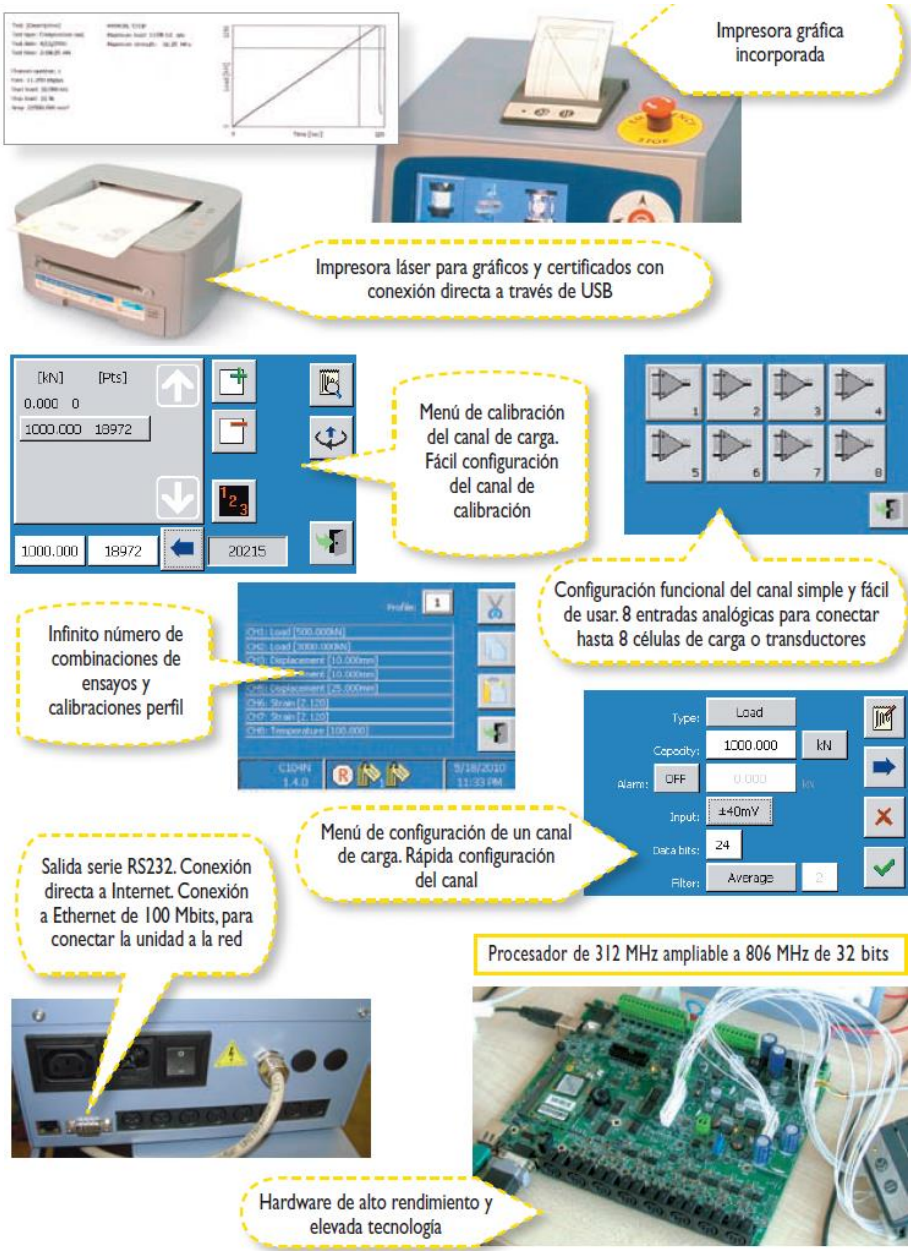
Fácil y sencilla selección de los ensayos (compresión)

Selección de ejemplos, Módulo de Elasticidad

Memoria de almacenamiento ilimitado con: 2 puertos USB* para ordenador, 1 ranura para tarjetas SD*
(* memorias no incluidas)



Control del gradiente automático para evitar el desmoronamiento de la muestra conforme a la Norma ASTM C39.



Main functions

- More intuitive interface which simplifies the use of the machine (test begins after a few simple inputs)
- Greater calculation ability and data visualization (on board charts and graphic print-outs)
- High management capacity for the multilingual framework and international settings (date and time, decimal units, unit of measure).
- Elastic software which allows the installation of new tests when desired.
- Profile configuration manager
- Configuration and calibration supervision of the analog channel
- Alarms manager
- Ethernet parameters configuration
- International settings configuration
- Hardware diagnosis functions
- Functions for the software update and licenses- Execution of tests through parameters set up customization
- Several levels of protection (passwords) to prevent the accessibility to the configuration menus by unauthorized staff.

Cyber-Plus Evolution C109N and Servo-Plus Evolution C104N are supplied complete with licenses for the execution of the following tests:

- Compression and Flexural on Concrete
- Splitting test on cylinders and concrete cubes
- Compression and Flexural on mortar

In accordance to the following standards:
UNI EN, ASTM, BS, NF, UNE, DIN etc.

Compression machine 2000 kN motorized, to test blocks max. 500x300 mm, cubes up to 300 mm side and cylinders up to dia. 160x320 mm.
Standards: EN 772-1 / UNI 6686, parte 1 e 2 / ASTM C39, E447 / AASHTO T22 NF P18-411 / BS 1610, 6073 / UNE 83304
ESPECIFICACIONES TÉCNICAS:

- Max. vertical daylight : 336 mm
- Compression platens : 510x320x55 mm
- Guages dia. 250 mm with specific resistance Scales for cubes 150 mm and cilynders dia 150 and 160 mm.
- Guges divisons: 2000 KN div. 5 Kn, 600 KN div. 2 KN.
- Hydraulic device to stop the piston´s stroke at its max excursion to avoid pumping the piston out of the cylinder
- Calibration accuracy: Grade 1.0
- Max. Ram travel 55 mm approx..
- Power supply (motorized models): 230 V I ph 50 Hz 750 W
- Dimensions: 870x600x1400 mm
- Wight: 8504900 Kg.

C109+C111-05+C121-01

ACCESSORIES:
C104-04 The pump assembly and the digital system are encased to enhance the design and look of the machine.
C098N Two-channels computerised graphic display system to control and manage all sorts of automatic testing machines.
C108N Two-channels computerised graphic display system to control and manage all sorts of semi-automatic testing machines, for acquisition, display, processing, printing and saving the test data and certificates, with software for remote control from PC.
C105 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.
C109-10 Software UTM2 (Universal Testing Machine 2). Developed for the managing.
C111-05 Distance pieces, 126+50 mm high for cubes 200 and 150 mm side.
C111-12 Distance piece, 126 mm gigh for cubes 200 mm side.
C111-22 Distance piece 50mm high.
NOTE: The cylindes Ø160x320 mm do not require any distance piece.
C111-23 Slotted distance piece, 50 mm high for central screw.
C111-27 Slotted distance piece, 20 mm high for central screw.
C111-28 Slotted distance piece, 76 mm high for central screw.
C111-08 Slotted distance pice, 126 mm highfor central screw.
C121-01Safety guards, polycarbonate, with hinges and lock, to CE Directive.
C123 Software “servonet” for remote control through PC of Autote machine.
C114-03 Compression testing machine 3000 KN capacity, but with gauges

Compression testing machine with automatic control system 2000 KN capacity

C111A+C127N+C105+C111-08+C121-01

Compression testing machine with semi-automatic control system 2000 KN capacity

C111D+ C127N+C105+C111-08+C121-01

CONCRETE COMPRESSION MACHINE 2000 KN MOTORIZED, SERVO-PLUS EVOLUTION
Compression testing machine, motorized with Servo-Plus evolution control unit (fully automatic model), to test blocks max. 500x300 mm, cubes up to 300 mm side and cylinders up to dia. 160x320 mm.
Standrds : EN 772-1 / ASTM C39, E447 / AASHTO T22 / NF P18-411 /
BS 1610, 6073 / UNE 83304

TECHNICAL SPECIFICATIONS:

- Max. vertical daylight : 336 mm
- Compression platens : 510x320x55 mm
- Hydraulic device to stop the piston´s stroke at its max excursion to avoid pumping the piston out of the cylinder
- Calibration accuracy: Grade 1.0
- Max. Ram travel 55 mm approx..
- Power supply (motorized models): 230 V I ph 50 Hz 750 W
- Dimensions: 870x600x1400 mm
- Wight: 8504900 Kg.

C112N+C127N+C105+C111-08+C121-01

C113N+C104-04+C105+C111-08+C121-01+C127N

C113N+C127N+C105+C111-08+C121-01

CONCRETE COMPRESSION MACHINE 3000 KN MOTORIZED, AUTOTEC

Compression machine, motorized with Autotec control unit, to test blocks max. 500x300 mm, cubes up to 300 mm side and cylinders up to dia. 160x320 mm

Standards: EN 772-1 / UNI 6686, parte 1 e 2 / ASTM C39, E447 AASHTO T22 / NF P18-411 / BS 1610, 6073 / UNE

ESPECIFICACIONES TÉCNICAS:

- Max. vertical daylight : 336 mm
- Compression platens : 510x320x55 mm
- Guages dia. 250 mm with specific resistance Scales for cubes 150 mm and cilynders dia 150 and 160 mm.
- Guges divisons: 3000 KN div. 10 Kn, 600 KN div. 2 KN.
- Hydraulic device to stop the piston´s stroke at its max excursion to avoid pumping the piston out of the cylinder
- Calibration accuracy: Grade 1.0
- Max. Ram travel 55 mm approx..
- Power supply (motorized models): 230 V I ph 50 Hz 750 W
- Dimensions: 900x600x1500 mm
- Wight: 115041220 Kg.

C109+C111-05+C121-01

ACCESSORIES:

C104-04 The pump assembly and the digital system are encased to enhance the design and look of the machine.

C105 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.

C109-10 Software UTM2 (Universal Testing Machine 2). Developed for the managing.

C111-05 Distance pieces, 126+50 mm high for cubes 200 and 150 mm side.

C111-08 Slotted distance pice, 126 mm highfor central screw.

C111-12 Distance piece, 126 mm gigh for cubes 200 mm side.

C111-22 Distance piece 50mm high.
NOTE: The cylindes Ø160x320 mm do not require any distance piece.

C111-23 Slotted distance piece, 50 mm high for central screw.

C111-27 Slotted distance piece, 20 mm high for central screw.

C111-28 Slotted distance piece, 76 mm high for central screw.

C121-01Safety guards, polycarbonate, with hinges and lock, to CE Directive.

C123 Software “servonet” for remote control through PC of Autote machine.

H009.01 Personal computer, complete with LCD monitor, keyboard, mouse, connection cables

C114-03 Compression testing machine 3000 KN capacity, but with 2 gauges

COMPRESSION TESTING MACHINE 3000 KN CAPACITY MOTORIZED SERVOPLUS

C114-06A+C127N+C111-22

COMPRESSION TESTING MACHINE 3000 KN CAPACITY MOTORIZED DIGITEC

C114-05D+C127N+C111-22

CONCRETE COMPRESSION MACHINE 3000 KN MOTORIZED, SERVO-PLUS EVOLUTION
Compression testing machine, motorized with Cyber-Plus or Servo-Plus evolution Touch Screen Digital System, to test blocks max. 500x300 mm, cubes up to 200 mm side and cylinders up to dia. 160x320 mm.
Standrds : EN ASTM C39 / AASHTO T22 / UNI 6686 part 1 and 2 / NF P18-411 / BS 1610 / UNE 83304

TECHNICAL SPECIFICATIONS:

- Max. vertical daylight : 336 mm
- Compression platens dia 287 mm
- Compression platens : 510x320x55 mm
- Hydraulic device to stop the piston´s stroke at its max excursion to avoid pumping the piston out of the cylinder
- Calibration accuracy: Grade 1.0
- Max. Ram travel 55 mm approx..
- Power supply (motorized models): 230 V I ph 50 Hz 750 W
- Dimensions: 900x600x1500 mm
- Wight: 115041220 Kg.

C124-10N+C104-04+C127N+C111-12+C121-07

ACCESSORIES:

C104-04 The pump assembly and the digital system are encased to enhance the design and look of the machine.
C109-10 Software UTM2 (Universal Testing Machine 2). Developed for the managing.
C111-05 Distance pieces, 126+50 mm high for cubes 200 and 150 mm side.
C111-08 Slotted distance pice, 126 mm highfor central screw.
C111-12 Distance piece, 126 mm gigh for cubes 200 mm side.
C111-22 Distance piece 50mm high.
NOTE: The cylindes Ø160x320 mm do not require any distance piece.
C111-23 Slotted distance piece, 50 mm high for central screw.
C111-27 Slotted distance piece, 20 mm high for central screw.
C111-28 Slotted distance piece, 76 mm high for central screw.
C121-01Safety guards, polycarbonate, with hinges and lock, to CE Directive.
C123 Software “servonet” for remote control through PC of Autote machine.
C127N Graphic printer on thermos-ppaer on board.
C114.03 Compression testing machine 3000 KN capacity, but with gauges
C124-19A Compression testing machine 3000 KN capacity same to the model C124.19N, but with Autotec operating system (non-touch).
C124-17D Compression testing machine 3000 KN capacity same to the model C124.17N, but with Digitec operating system (non-touch).

COMPRESSION TESTING MACHINE 3000 KN CAPACITY MOTORIZED SERVOPLUS

C124-10N+C127N+C111-12+C121-07

COMPRESSION TESTING MACHINE 3000 KN CAPACITY MOTORIZED DIGITEC

C124-08N+C127N+C111-13+C121-07+C121-51

CONCRETE COMPRESSION MACHINE 3000 KN MOTORIZED, SERVO-PLUS EVOLUTION

Compression testing machine, motorized with Servo-Plus evolution control unit (fully automatic model), to test blocks max. 500x300 mm, cubes up to 300 mm side and cylinders up to dia. 160x320 mm.

Standrds : EN 772-1 / ASTM C39, E447 / AASHTO T22 / NF P18-411 /
BS 1610, 6073 / UNE 83304

TECHNICAL SPECIFICATIONS:

- Max. vertical daylight : 336 mm
- Compression platens : 510x320x55 mm
- Hydraulic device to stop the piston´s stroke at its max excursion to avoid pumping the piston out of the cylinder
- Calibration accuracy: Grade 1.0
- Max. Ram travel 55 mm approx..
- Power supply (motorized models): 230 V I ph 50 Hz 750 W
- Dimensions: 900x600x1500 mm
- Wight: 115041220 Kg.

C124-19N+C104-04+C127N

ACCESSORIES:

C104-04 The pump assembly and the digital system are encased to enhance the design and look of the machine.
C105 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.
C109-10 Software UTM2 (Universal Testing Machine 2). Developed for the managing.
C111-05 Distance pieces, 126+50 mm high for cubes 200 and 150 mm side.
C111-08 Slotted distance pice, 126 mm highfor central screw.
C111-12 Distance piece, 126 mm gigh for cubes 200 mm side.
C111-22 Distance piece 50mm high.
NOTE: The cylindes Ø160x320 mm do not require any distance piece.
C111-23 Slotted distance piece, 50 mm high for central screw.
C111-27 Slotted distance piece, 20 mm high for central screw.
C111-28 Slotted distance piece, 76 mm high for central screw.
C121-01Safety guards, polycarbonate, with hinges and lock, to CE Directive.
C123 Software “servonet” for remote control through PC of Autote machine.
C127N Graphic printer on thermos-ppaer on board.
C114.03 Compression testing machine 3000 KN capacity, but with gauges
C124-19A Compression testing machine 3000 KN capacity same to the model C124.19N, but with Autotec operating system (non-touch).
C124-17D Compression testing machine 3000 KN capacity same to the model C124.17N, but with Digitec operating system (non-touch).

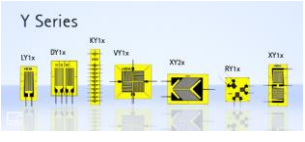
COMPRESSION TESTING MACHINE 3000 KN CAPACITY MOTORIZED SERVOPLUS

C124-19N+C127N

COMPRESSION TESTING MACHINE 3000 KN CAPACITY MOTORIZED DIGITEC

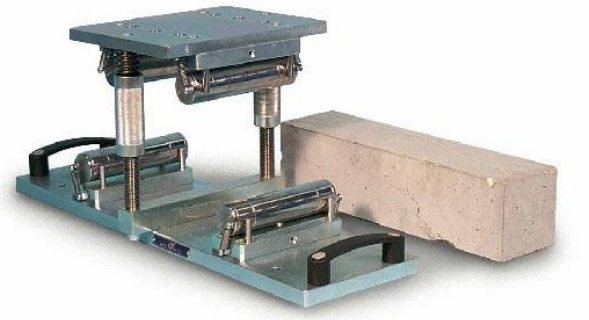
C124-17N+C127N

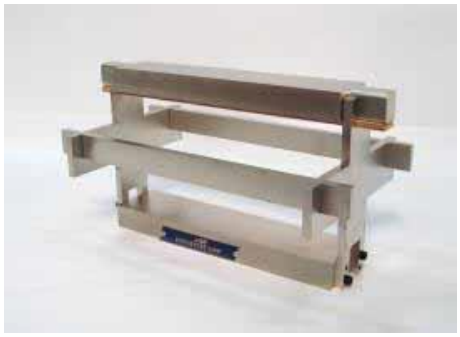
C125 Strain gauge of 60 mm
C126 Strain gauge of 30 mm
C127 Strain gauge of 20 mm
C128 Strain gauge of 10 mm



EN 12390-5 / NF P18-407/ ASTM C78, C293/ AASHTO T97/ BS 1881:118

C130 Flexural device for two point and centre point tests on concrete beams 100x100x400/500 and 150x150x600/750 mm.
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
Dimension: 610x200xh320 mm.
Weight: 27 Kg



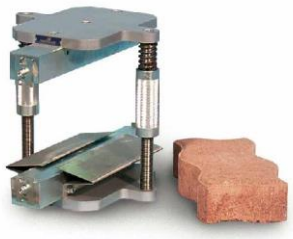


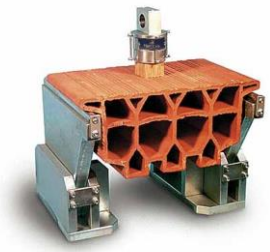
C131 Spliting tensile test device for cylinders EN 12390-6 / ASTM C496 Traction device indirect Brazilian test for specimens Ø 150 x 300 mm. comprises a lower support plate with auto-centering and higher supports compression.

C133 Distance piece (extension) plate of Ø360x50 mm thickness with handles

C134 Reducer (extension) plateof Ø320x50 mm thickness with handles

C135 Splitting tensile test device to perform tests on concrete cube specimens 100 and 150 mm and on concrete block pavers.
Dimensions: 350x250x264 mm.
Weight: 17 kg
Note: to perform the test, these devices have to be used with a concrete compression machine equipped with a low capacity measuring range or with a flexural frame.





C136 Device for flexural tests on clay blocks for flooring. It consists of two lower bearers dia.20x300 mm and upper square wooden pressure punch.

CONCRETE FLEXURAL MACHINE 150 KN, ''OPEN SIDED FRAME'', MOTORIZED, CYBER-PLUS EVOLUTION
EN 12390-5/ EN 1340:4/ ASTM C78, C293/ ASSHOT T97/ BS 1881:118, BS 6073-1, BS 7263/ NF P18-407, P98-302/ DIN 51227

C140 Concrete flexural machine 150 kN " open sided frame, motorized withCyber-Plus evolution control unit (semi-automatic model) to perform flexural tests on concrete beam specimens max. dimensions 200x200x800mm, flat blocks, flagstones, kerbs, tiles, slabs, masonry units, and any type of material having max. size 600x250 mm (lower rollers max. length 1325 mm)

The frame is supplied "**Without"** upper/lower rollers group, to be ordered separately

CONCRETE FLEXURAL MACHINE 150 KN, ''OPEN SIDED FRAME'', MOTORIZED, DIGITEC

C140.02

CONCRETE FLEXURAL MACHINE 150 KN, ''OPEN SIDED FRAME'', MOTORIZED, SERVO-PLUS EVOLUTION

C140.03

Accessories:
C141.10 Roller group, lower adjustable from 75 to 525 mm, and "**only one**" upper central roller for single point method
C141.11 Rollers group, lower adjustable from 75 to 525 mm, and upper adjustable from 75 to 180 mm for two points method.
C141.12 Rollers group, lower adjustable from 75 to 1325 mm, and upper adjustable from 75 to 575 mm for two points method.
C141.14 Rollers group, lower adjustable from 75 to 1325 mm, and **"only one"** upper central roller for single point method.

C141.13 Concrete kerbs and slabs device

FLEXURAL STRENGTH MEASUREMENTS
The equipment consists of a steel tamper is mounted on a rotating coupling which is fixed to the upper part of the flexural strength on three points on the kerb, without any torsional stress. Standard: En 1340, 1339.

C140.13

REBOUND CONCRETE TEST HAMMERS
EN 12504-2/ ASTM C805/ DIN 1048/ BS 1881:202/ NF P18-417

C145 Concrete Test Hammer to determine the compressive strength of concrete in various parts of a structure.
The test consists of pressing the hammer piston against the concrete surface which compresses the spring and automatically releases percussion mass strikes the piston and the concrete surface.
Impact energy: 2.207 Nm. (0225 Kgm)
Compressive strength: 10-70 N / mm ²
Dimensions: 340x100x100 mm.
Weight: 2 kg approx.
C150 Anvil used for verification and calibration of the Hammers

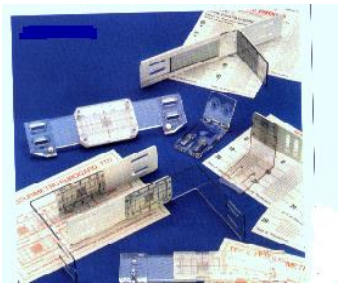
C150

C146 Concrete Test Hammer designed to perform nondestructive testing on concrete and rapid response of compressive strength of concrete, providing the calibration curve.

TECHNICAL CARACTRISTICAS

- Percussion Energy: 2207 Joule
- Measuring range: 10 - 120 N / mm ² • USB Output
- Digital microprocessor

Supplied complete with software, USB cable, rechargeable battery, grinding wheel and carrying case



CRACK WIDTH GAUGE FOR WALLS

C148 Fisurómetro to control, measure and record the width of the cracks in a structure.
Internal or external use, made of durable polycarbonate, complete with a seamless registration card for each indicator that facilitates easy tracking.
Suitable for measuring horizontal and vertical movements on a flat surface.
Supplied in pack of 5.
C149 Similar to C148 Fisurómetro Suitable for controlling cracks in corners with bidirectional movements even simultaneously. Supplied in pack of 5.

Mechanical strain gauges
Standards: ASTM C426 / BS 1881:206

Use to determine the strain (length changes) in concrete specimens and structures, rock strata, different parts of a structre, in remote areas and under adverse conditions, using a single instrument. Different models are available with analogic or digital gauge, 100, 200, 300 mm measuring leggth, depending on the standard length to be measured. The instrument can also be used for other structures like steel and wood.
The standard equipment comprises:
- Strain gauge (extensometer) complete with analogic or digital indicator 0,001 mm graduations (see avaible models).
- Calibration bar used also to fix the datum disc on the structure.
- 50 datum discs.
- Adhesive compound for datum discs.

The whole contained in carrying case.

C149

Models with “analogic gauge! 0,001 mm graduations

C149 Strain gauge, 100 mm measuring length, complete
C149.01 Strain gauge, 200 mm measuring length, complete
C149.02 Strain gauge, 300 mm measuring length, complete
Modls with “digital gauge” battery feeded, with reading values in mm (sens. 0,001 mm) and inch.

Complete with battery, but without RS232 port.

C150 Strain gauge, 300 mm measuring length, complete
C150.01 Strain gauge, 200 mm measuring length, complete
C150.02 Strain gauge, 100 mm measuring length, complete

C150

-⟶ Battery rechargeable pack NiMh 4,8V > 2000m/A with low battery condition alarm.
- Anti shock case holding the unit and the accessories.
- External feeder 230V and battery charger 12V 500m/A.
Case dimensions: 400x340x110mm
Weight: 2 kg approx

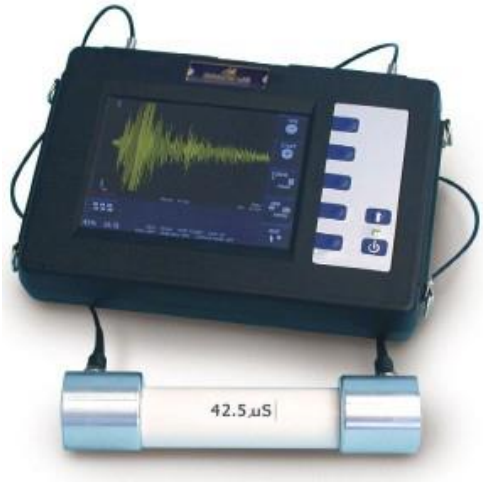
ULTRASONIC PULSE VELOCITY TESTER
EN 12504-3/ ASTM C597/ BS 1881:203/ NF P18-418

C151 Determine the presence of faults, voids, cracks etc. in “in situ” or precast concrete and for longterm monitoring of structures subject to evnvironmental conditions.
- Measuring range: 0 - 3000 µs - accuracy +/- 0,1 µs
- Selection of the ultrasonic pulse amplitude adjustable from 250 to 1000 V
- Measurement of the required time by the ultrasonic pulse to go through the tested material.
- Single or continuous acquisition mode with automatic or manual saving.
- Zero calibration with depuration of the time for the pulse to go through the probes.
- Calibration of a defined time value.
- Capacity of data acquisition, processing and filing of the test data up to 30.000 samples.
- Interface mini USB for PC connection.
- Two outlets for connection to the oscilloscope.

The standard appliance includes:
- The instrument in basic configuration in a practical palmer container.
- Two 55kHz probes with connection cables.
- Calibrating cylinder and contact paste.↺

EN 12504-4/ ASTM C597/ BS 1881:203/ NF P18-418

C152 Ultranic pulse velocity tester, high performance with microprocessor for combined ultrasonic and rebound hammer data acquisition and processing. Appliance allows measuring the ultrasonic impulse speed inside the material (by knowing the distance between the probes). It measures the distance between the probes/by knowing the speed of the ultrasonic impulse to go through the tested material). Young,´s moulds is also measured (by knowing the distance between the probe and the density of the tested material). Selection of the impulseamplitude. Selection of the transmission frequency of the impulse.
Infinite filing capacity of the test sates and the graph tracing of the tests on SD card or Compact Flash extractable and expandable, RS232 or RS485 or USB interface for PC or printer connection.
Time measuring: 0 to 9999.9 µs.
Resolution: 0.1 µs.
Standard instrument is supplied with basic configuration (X-Scale 400 MHz, 64 MB flash memory, 64 MB Ram), Two 55 kHz probes with connecting cables, Calibrating cylinder and contact paste, Battery pack Li-Ion 11 1 V, 3000 mA h, External feeder 230V, 24V and battery charger and carrying case.
Dimensions: 400x300x180 mm
Weight: 3 Kg approx.



C152

Deep Sacanning metal detector

C153 Deep scanning metal detector up to 150mm.
This locator finds and scans, through solid concrete, steel rebars and metallic materials like pipes, electric cables, junction boxes, metal studs and frames up to 150mm deep.
It differentiates magnetic metals from non magnetic ones.
Accuracy: rebars or pipes 14mm dia. with minimum grid space of 152mm are scanned within 13mm tolerance.
Depth: 152 +/- 25mm
Alkaline battery 9V (not included) for one year use.
Dimensions: 250x110x62mm
Weight: 300g approx.

COVERMETER

C158 provides rebar location, sizing and cover measurement in a single weather-resistant instrument. For immediate results on-site, the onscreen gauge and audio feedback rapidly pin-point rebar location and orientation.
Cover is easy to read on the back-lit display and time-stamped readings can be logged instantly with a simple button press on the probe.
Bar size can be preset if known, or detected automatically for survey and investigation tasks. For non-standard bar sizes, large diameter pipes or other pre-fabricated items, the MC8022 can
also show absolute measurements that can be used to look up cover using custom tables.

Technical Specification

Cover range	5mm – 185 mm
Accuracy	± 1mm up to 60mm cover ± 2mm up to 120mm ± 3mm up to 160mm ± 4mm over 160mm
Resolution	0,1 mm
Operating Weight	800 g. (instrument+probe+cable)
Operating Temp	-10 ° C - + 50 ° C
Battery Operation	20 hrs
Battery Charger	110 – 240V AC
Ingress Protection	IP65

C159 Covermeter same model C158, but with executive hard case in place of equipment bag - Protective dust-cover and wrist strap.


C158


C159

COVER TO REINFORCEMENT

For determining the presence position, direction, dept and diameter of steel reinforcement bars in concrete structures.
Standards: BS 1881:204 / DIN 1045
C161 Versatile, fully-integrated rebar detector and cover meter with a unique real-time rebar visualization allowing the user to actually “SEE” the location of the rebar beneath the concrete surface to a maximum deep of 180 mm.
This is coupled with rebar-proximity indicators and optical and acoustical locating aids.
Rebar diameter can also be estimated within the specified testing range.
The Profoscope combines these unique features in a compact, light device that allows the user to operate this rebar detector with one hand making the task of locating rebars a simple and efficient process.
In addition the unit convinces through its intuitive user interface making rebar detection easy.
C162 Profoscope+ (plus). Same features of mod. C161, but additionally offers the innovative memory function for automatic data acquisition, by eliminating the manual measurements of a test series, saving time and unnecessary source of errors.

FEATURES:

- Visual indication of rebars in close proximity.
- Ability to identify the mid-point between rebars as well as the orientation of rebars.
- Optical and acoustical indication of rebar location and minimum cover alert.
- Neighboring bar correction.
- Cordless and single handed operation.
- Icon-based language independent menus.
- Start-up test kit allows user to familiarize with all functions in a comfortable environment, wasting no time on site.

GROUP I&S

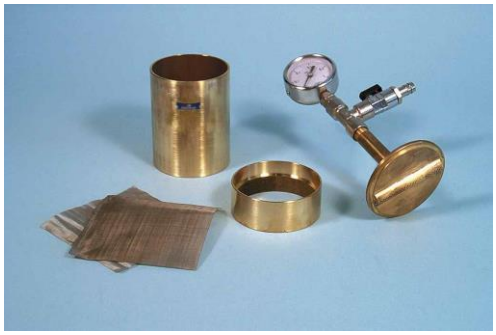
Cements

GROUP I&S

GROUP I&S

BLAINE AIR PERMEABILITY APPARATUS
EN 196-6 / ASTM C204 / BS 4359 / NF P-15 442 / AASHTO T153
D001 Blaine air permeability,. 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, vaseline grease for better coupling tube/cell, funnel, brush.
Dimensions: 220x180x470mm
Weight:12 Kg
Accessories:
D001.01 Filter paper disc box of 1000 pcs.
D001.02 Standard reference cement 114 g. to ASTM / SRM / EN
D001.03 Glass termometer -10º a +50ºC.
D001.04 Manomentric liquid (250 ml) bottle
D001.05 "U" tube glass manometer
D001.06 Cell body, stainless steel
D001.07 Cell perforated disk, stainless steel
D001.08 Vacuum pump

BLAINE AIR PERMEABILITY APPARATUS, AUTOMATIC
D002 This automatic electronic apparatus with microprocessor is equipped with an automatic airproof device.
The apparatus consists of a flat enclosure with a manometer column and with 4 components stainless steel measuring cell.
Depending to the cement porosity and its density, the equipment calculates automatically the masse that you have to test, determines the constant K according to standard cement, records the test results with possibility to elaborate an average value of different tests. RS 232 port.
The defining of final Blaine value is automatically given by the apparatus.
Supplied complete with accessories.
Power supply: 230V 1ph 50Hz
Dimensions: 280x325x410mm
Weight: 10 kg



EQUIPMENT FOR DETERMINING RESIDUE BY MEANS OF WATER FLOW
UNE EN 451-2 / D.M. 3/6/68
D003 Used to determine the fineness of cement.
It consists of a spr ying 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 sprying 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
Accessories:
D003.01 Stainless Steel cloth disk, opening 0,18 mm
D003.02 Stainless Steel cloth disk, opening 0,09 mm

Fineness of fly ash by wet sieving
Standards: EN 451-2 / ASTM D430
D004 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

GRAVITY OF HYDRAULIC CEMENT
EN 196-6 / UNE 83453 / ASTM C188 / AASHTO T133 / BS 4550
D006 Le Chatelier flask to determine the relative density(specific gravity) of the hydraulic cement and lime.
Capacity: 250 ± 0.05 cm ^{3}
Graduation: between 0 to 1 ml and from 18 to 24 ml with divisions of 0,1 ml.
Weight: 500 g.

DROPPING BALL APPARATUS

BS 4551-1, 6463-4
D007 Used to measure the consistency of cement mor tars, 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 brass ring 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.100 x 25mm.
The base of the stand is machined.
Chromed finishing.
Weight: 8 Kg

ACCESSORIES:
D007.01 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

D007 D007.01

Filter press for muds
API (American Petroleum Institute), recommended practice 13B-1 and 2
D008 This filter press is the most effective means for determining the filtration properties of drilling muds and cement slurries.
The filter press consists of a mud reservoir mounted in a frame, a pressure source, a filtering medium, and a graduated cylinder for receiving the measuring filtrate, pack of 100 filter paper, nitrogen pressurized cartridges.

Dimensions: 210x240x500 mm approx
Weight : 12 kg

Accessories:
D009.01 Propane regulator, butane or natural gas (to be defined in your order).
D009.02 Standard Potassium solution
D009.03 Standard sodium solution
D009.04 Standard calcium solution
D009.05 Standard Barium solution
D009.06 Standard Lithium solution

D009 Flame photometer for routine determination of sodium (Na) and potassium (K), with possibility of adding additional filters as lithium (Li), barium (Ba) and calcium (Ca). In cements and raw materials as reference methods EN 196-2
features:
Electronic ignition system with automatic regulation of the air supply.
Electronic unit with 3 ½ digit LED display for concentration ranges from 0 to 199.9 ppm
Range:
Na from 0.50 to 10 ppm - CA 3.0 - 40 ppm - K0.75 - 25 ppm
Ba5.0 - 100 ppm - Li0.75 - 20 ppm
Reproducibility 1% CV for 20 consecutive samples, 10 ppm reading scale 100
Linearity better than 2% Na and K 3 ppm to 5 ppm Li
Interferences for Na, K and Li in better concentration of 0.5%.
Supplied with:
Air compressor 6 L (1 kg / cm ²)
Setting standards
Does not include calibration patterns
Power: 230V, 50 Hz
Dimensions: 420x360x300 mm.
Weight: 8 kg

Bulk cement sampler
EN 196-7 / ASTM C183 / AASHTO T127
D010 Used to sample cement in bulk storages or shipment. Brass made, it consists of two concentric tubes with slots. Inside tube volume is 3 litres approx.
Dimensions: dia. 40x1500mm
Weight: 5 Kg

D010.01 Packaged cement tube sampler**.** Used to sample cement homogeneously from cement bags.
Dimensions: dia. 32 x 1050mm
Weight: 3 Kg
D010.02 Sampling spoon with handle

Bulk density of cement
EN 196-6 / ASTM C91, C110
D011 Equipment for determining 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, spatula, straight edge, aluminium scoop.
The discharge hole of the funnel has 8 mm dia.
Dimensions: dia. 350 x 520mm
Weight: 5 Kgcomprises funnel cement with shutoff valve and measuring tripod 1 l. capacity.
Dimensions: Ø345 x 520 mm.
Weight: 3 Kg approx.

CRAKING TEST MOULD
NF P15-434
D012 Mould designed for 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

FLOW CONE APPARATUS
EN 455 / NF P18-358, P18-507
D012 Funnel for viscosity and fluidity determinations of mortars, muds, grouts, fluid materials, etc.
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 heigh, plastic graduated cup.
Cone top dia. is 155 mm, total lenght 290 mm, capacity 1700 cc.
Weight:10 Kg

Accessories:
D012.01 Ø12, 5 mm.Interchangeable nozzle
D012.02 Ø 150 mm sieve, mesh size 1.5 mm.

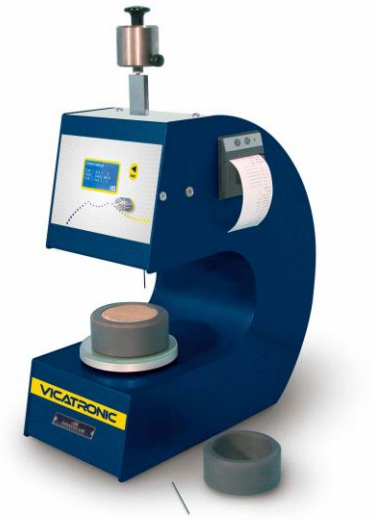
Level Support
EN 1015-9
D014 Lever Support (drill-holder type), complete with washer and penetration rod brass made, clamp and locking support.
Used for the determination of stiffening time on products and systems for the protection and repair of concrete structures. Complete with container.
Dimensions: 380 x 300 x h500 mm
Weight: 12 kg approx.Excludes balance.

D016 Baroid mud balance
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

Sand Content of Drilling Muds
D018 The Sand Content Kit is a simple, accurate and inexpensive sieve analysis apparatus for determining the sand content of drilling muds.
The kit consists of a special 200-mesh sieve 2,5” in diameter, faste-ned inside a collar upon which a small funnel is fitted on either end.
This is used with a 10ml glass measuring tube, graduated to read from 0 to 20% the percentage sand by volume.
The collar and funnel are made of polyethylene and the screen is made of brass. A 500ml wash bottle and carrying case are included.
Weight: 1500 g

METHOD VICAT
UNE-EN 196-3/ EN 13279-2/ EN 480-2/ ASTM C187, 191/ BS 4550/ NF P15-414, P15-431
Determination of setting time and consistency of cement
D020 Vicat Needle manual, the instrument consists of a metallic frame, graduated scale with index, sliding probe of 300 g, consistency plunger dia. 10 mm, glass base plate. Supplied with full needle initial setting of Ø1, 13 mm, glass plate and conical mould.
D020.01 Final needle
D020.02 Initial **n**eedle
D020.03 Conical mold
D020.04 Glass Base (EN, ASTM).

AUTOMATIC COMPUTERISED TROPICALIZED VICAT RECORDING APPARATUS
EN 196-3 / EN 13279-2 (gypsum) / EN 480-2 / ASTM C191 / DIN 1168 / UNE 80102 / NF P15-414, P15-431 / AASHTO T131
D021 The Vicat aut. apparatus, that is designed and manufactured using the most recent and sophisticated technology, is used for the initial and final setting time determination of cements or mortar pastes. The unit is manufactured with **anticorrosion and tropicalised** components to be used in places with humidity not below 90% and 20°C. Controlled temperature as required by EN Specifications. The entire test is made in a fully automatic way and gives a very precise and repeatable result.
The results are printed on the incorporated printer and this eliminates the manual operations of installing and zeroing the paper graph on the drum.
DISPLAY
The large high contrast LCD display (negative blue) has a high resolution and shows the test data together with the general functions of the appliance. It visualises for the first time in real time the graph of the test (see picture) replacing and simulating what the old fashioned pen tracing on the paper. The appliance has a clock calendar that is used to program the test cycles.
FIRMWARE
The Vicat aut. is supplied with the standard programs to make automatically, all the tests according to the following Standards: **EN 196-3:2005 / EN 13279-2 gypsum / EN 480-2** / ASTM C191 / DIN 1164 / DIN 1168 gypsum / NF P15/431 / BS 4550 / AASHTO T131.
Further programs can be developed by the operator using the specific menu **"free tests"** available on the base firmware; the user has the possibility to set 5 totally free test profiles defining the number of penetrations and the coordinates of each penetration (ray in mm of the circle where the number of penetrations have to be distributed) and number of circles.
TIMER 0 – 999 MINUTES
The firmware allows activating a delay on the appliance to the beginning of the test.
The unit is supplied complete with:
. Standard program to make automaticallyall tests according to the following standards EN 196-3/05, EN 13279-2 / EN 480-2 / ASTM C191 / DIN 1164, DIN 1168 / NF P15/431 / BS 4550 / AASHTO T131. Other programs may be developed by the operator using a specific menu "free trial".
. Integrated printer
. Needle Ø1, 13 mm (EN, BS, DIN, NF, UNE)
. Needle Ø 1 mm (ASTM, AASHTO), Two conical plastic moulds EN and ASTM, Ø120 mm glass base and Instruction Manual↗

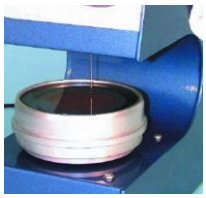


Accessories for testing different regulations must be ordered separately.
Power supply: 220-240 V, 50 Hz, 50 W.
Dimensions: 400x200x475 mmh.
Weight: 14 kg approx.

Accessories:
D021.01 Needle for initial setting Ø1, 13 mm (EN / BS / DIN / NF).
D021.02 Needle for initial setting Ø1 mm (ASTM / AASHTO).
D021.03 Needle for final setting Ø1,13 mm (On / BS / DIN / NF).
D021.04 Additional weight of 700 g (EN / NF).
D021.05 Consistency test probe
D021.06 Probe for testing consistency Ø10 mm (EN / ASTM).
D021.07 Vicat mould Ø70/80x40 mm (EN / NF).
D021.08 Vicat mold Ø60/70x40 mm (ASTM / AASHTO).
D021.09 Glass Base
D021.10 Probe 300 g to (EN 196-3)
D021.11 Thermal printer paper (10 rolls pack).
D021.12 Cleaning device needle

COOLING EQUIPMENT
B055 Electronic microprocessor thermostatic bath with selection and digital temperature reading. Adjustable safety thermostat that blocks the heating system in case of over temperature (DIN 12879 class 2).
Temperature sensor PT-100 Class A.
Compressor Group 1/8 hp
Timeout commissioning programmable from 0 to 99.5 hours.
Time keeping temperature programmed from 0 to 99.5 hours.
Recirculation pump internal and external.
Adjustable temperatures from -10 º C to 99.9 º C
Bucket capacity 8 liters.
Opening the cap 200 X 130 mm.
Power: 220V, 50 Hz 1150 W
Dimensions: 380 X 600 X 420 mm
Weight: 28 Kg

D022 Dip tank for molding test in water. The test should be performed in a cabin with temperature control at 20 ° C ± 1 ° C. moisture saturation is achieved by immersing the sample in water as indicated in the standard EN 196-3

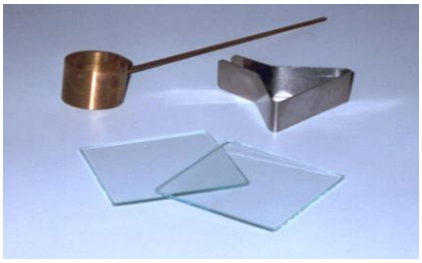


FLOW TABLE MOTORIZED, COMPLETE - EN 459-2, EN 1015-3
D024 Constructed by a stainless steel circular board Ø300 mm supported on a tripod and a gearmotor machining steel which raises and lowers the cam at a certain height of 10 mm. Supplied complete with digital electronic counter blows with no automatic shutdown, conical mold, hopper and compaction hammer.
Power supply: 220V, 50 Hz
Weight: 35 kg approx.

FLOW TABLE MANUAL, COMPLETE
UNE-EN 1015-3/ EN 459-2/, ASTM C230/BS 4551-1
D026 Shaker constructed in accordance specifications of standard test board made of stainless steel. Ø 300 mm. Supported on a tripod and a machined steel wheel that performs as for raising and lowering the cam at a certain height of 10 mm.
Comes complete with conical mold, hopper and compaction hammer.

Accessories:
D026.01 Conical mould of Ø 101.6 / 69.9 x 50.8 mmh.
D026.02 Rammer absorbent material.
V297 Flow Calliiper 200x0, 01 mm to measure the diameter of the sample
V296 Flow Calliper 200x0, 01 mm with digital

STABILITY CEMENT AND HYDRATED LIME
EN 196-3/ UNE 80103/ NF O15-432/ BS 6469
D029 Le Chatelier mold Ø 30 x 30 mm interior with two rods
D030 Le Chatelier clamp for fastening glass plates
D031 Glass plates (2), 50 x 50 mm.
D032 100 g weight to place over the glass plates



D033 Le Chatelier thermostatic water bath 12 l. Capacity for 4 needles Le Chatelier. Adjustable temperature up to 120 º C. body constructed stainless steel interior and exterior painted in epoxy. Heating by armored heating elements in stainless steel. cubrer-resistance tray. Stainless steel cover. Orifice disc adapters 80, 60 and 40 mm. Supply 220 V.

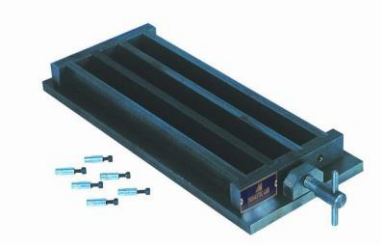
D034 e Chatelier thermostatic water bath similar to the above, but in 20 l. Sleeps 6 needles Le Chatelier

PLASTER EXTENSOMETER
D035 Utilized to measure the linear expansion of a paste of standard consistence. 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

LENGTH COMPARATOR, ANALOGIC and DIGITAL
EN 1367-4, 12617-4, 12808-4 / BS 1881:5, 6073/ ASTM C151/ NF P15-433, P18-427
A133 Used for measuring variations in length of the specimen. The top bridge can be adjusted to suit the length of the specimen.
It also measures the linear shrinkage of samples having different dimensions.
As: 40x40x160 mm, 1 "x 1" x 1 "¼.
Supplied without gauge and reference rod (see accessories).

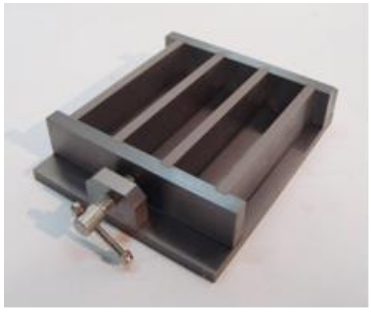
Accessories:
A133.01 Dial indicator 5 mm travel x 0,001 mm divisions
A133.02 Dial indicator 12,5 mm travel x 0,001 mm divisions
A133.03 Reference rod Invar for calibrating the specimens

PLUNGER PENETRATION APPARATUS
EN 413-2, 459-2 / EN 1015-4
D036 Equipment 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, both anodized aluminium made
Dimensions: 200x200x700 mm
Weight: 8 Kg



EXPANSION TEST MOLDS
UNE 80113/ ASTM C490, C348/ BS 1881, 6073/ NF P18-427
D037 Three gang prism mould, for the preparation of specimens of 1 "x1" x11 ¼ "(25.4 x 25.4 x 287 ± 2 mm) steel grinding, fully removable to accommodate bolts holes (contact point).

D037.01 Contact points, stainless Steel, Pack of 15



UNE-EN 196-1, 413, 459, ISO-679, UNE-80.101
D038 Three gang mould completely removable, manufactured for preparing to produce 4x4x16 cm prisms. Steel construction fully rectified.
Internal dimensions: 40.0 ± 0.4 x 40.1 ± 0.3 x 160.0 ± 0.8 mm. (Width x Depth x Length) with holes to accommodate bolts (contact tip).

D037.01 Contact points, stainless Steel, Pack of 15

ASTM C490
D039 Two gang prism mould to produce 75x75x254 mm specimens. Complete with 4 steel inserts.
Weight: 9 Kg

D039.01 Contact points, stainless Steel, Pack of 15

BS 1881, 6073
D040 Two gang prism mould to produce 25x25x250 mm specimens for expansion tests in autoclave. Complete with 4 steel inserts.
Weight: 6 Kg

D040.01 Contact points, stainless Steel, Pack of 15

D041 Triple prism mould, for the preparation of 75x75x275 mm specimens. Manufactured of steel grinding inside, fully removable and accommodation placement steel insert.

D041.01 Contact points, stainless Steel, Pack of 15

D043 Deviation meter of 500 mm. completely realized of stainless steel. and aluminum. As a measuring instrument incorporating an analog comparator 10 mm path with appreciation of 0.01 mm in its standard configuration, but may be replaced by any other (provided that the stem coincides with the support comparator comparator).
The ruler has an appreciation of 1 mm and its edges are machined to ensure the correctness of this element.
Technical:
Dimensions: 520x 30x140 (height) mm
Measuring range of the comparator (horizontally): from 15 mm to 485 mm.→

Separation range between fixed and movable tip tip: from 52 mm to 480 mm.
Presented in a wooden case.

UNE-EN 1015-7/ EN 459-2, 413-2/ DIN 18.555
D044 Determination of air entrainment in mortars
Entrained meter air content in cement mortar. Constructed of cast aluminum with seal by spring clamps quick action. Supplied with direct indication gauge air content in% 0-50% range and manual air pump built.
Capacity: 1 Liter
Accuracy: 2 bar
Weight: 5.8 Kg

DIGITAL PULL-OFF STRENGTH TESTER 16 KN CAPACITY
EN 1542 / EN 1348, EN 1015-12 / EN 13687-2 / EN 13963 / EN 14496 / NF P18-858 / BS 1881:207 / ISO 4624
D047 This dynamometer measures the adhesive force and the tensile strength of two layers of materials (concrete, facing plasters, mortars, building plasters, lime etc.). Compact, light and suitable for use in any location, this Pull-Off Tester is fitted with a load cell and high resolution large digital display unit; it is therefore suitable for measurements from low loads up to 16 kN. The direct tensile force is applied by rotating the hand wheel.
The three feet of the unit can be fixed in the **"large" position** (overall dimensions 176mm diameter) with very stable bearing, or in the**"compact" position** (overall dimensions 92,5mm diameter), to perform tests in narrow spaces, or for specimens close one to the other.

Specifications:

Load capacity: 16 kN	Battery operated
Resolution: 10 N	Serial port for PC connection
Working range: 0,25 to 16 kN	Hand wheel rounds: 60 with mechanical round/counter
Accuracy and repeatability: better than +/- 1%	Graphic indication of the applied load rate
Complete with traceable calibration certificate	Seat ball assuring axial/central load application

Supplied complete with carrying case, but **WITHOUT** accessories to perform the test, which have to be ordered separately. Dimensions: 410 x 210 xh 270 mm
Weight: 3,5 kg approx.
Accessories:
D047.01 Disc of aluminum Ø 50 mm (pack of 15 pcs.)
D047.02 Centering drill diameter of 50 mm, for the preparation of the test surface
D047.05 Adhesion Gauge Calibration with traceability certificate (1 scale)

CALORIMETER
EN 196-8/ ASTM C 186/ BS 4550, 1370/ DIN 1164
D048 Used to determine the heat of hydration of the hydraulic cement and Portland. Formed by a Dewar fleak housed in a wooden box open into two halves, allowing easy access so you can be easily replaced. A second wooden box also open into two halves, the first houses, ensured their perfect thermal insulation. The unit is supplied with constant speed electric stirrer, thermometer and centesimal Beckman glass funnel. The stir bar and Beckman thermometer must be ordered separately according to the standard test.
Power supply: 1 x 230 V. 50 Hz 150 W.
Dimensions: 350 x 250 x 680 mm.
Weight: approx. 12 kg.
Accessories:
D048.01 Propeller conforming to EN 196-8 Specifications.
D048.02 Propeller conforming to ASTM C186 Specifications.
D048.03 Dewar flask
D048.04 Glass funnel

D048.05 Beckman centesimal glass thermometer
D048.06 Digital centesimal thermometer
V441 Electric heater of Paraffin

THERMAL CEMENT SYSTEM
SPECTROPHOTOMETER
UNE EN 196-2:1996

V336 The thermo-cement system is a combination of a spectrophotometer cuvette thermostated 200 ml for titration titrimetric photometrically, overhead stirrer and a variable speed controller PID digital controller temperature to 99.9 ° C with 0.1 ° C accuracy . The set fits the UNE - EN196-2: 1996 for cement by colorimetric analysis.

Espectrofotómetro:
200 ml heated cuvette and Pt100 temperature sensor.
Concave diffraction grating, 1200 lines.
Bandwidth: 5 nanometres.
Range: 330 - 850 nm (in 0.1 nm).
Scales: Abs 0.170-2.000.
Trans 0-150%.
Scanning: from 60 to 800 nm/minute.
LCD screen, graphic data and printing.
RS232 port and parallel port.
Supplied with a stirrer and an opening in the lid of the sample compartment to adapt the assessment burette and the stirrer.
Power supply: 230V/50-60 Hz.
Digital visible spectrophotometer for the analysis of cement in compliance with UNE-EN196.2:1996, with thermostatic cuvette tray, cuvette and stirrer.

V336 V337

V337 Temperature Controller
Range: from ambient to 99.9 ° C
Accuracy: ± 0.1 ° C
Proportional: PID
Digital display: Temperature programmed current
Power supply: 230V, 50-60 Hz

Accessories:
V338 200 ml optical glass cuvette.
V339 Adjustable paddle stirrer.

FUNNEL GROOVE
Consistency of Grouts
EN 13395-2
D050 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

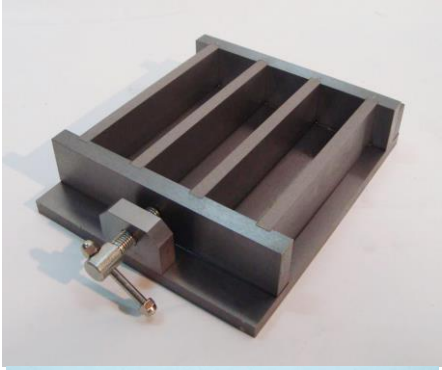
B117 Marsh cone to determine the viscosity of sludge.
Manufactured of durable plastic mesh of 2 mm light on top and outlet orifice of 4.7 mm, Supplied complete with 1 liter container.
Dimensions: Ø160 x 370 mm
Weight: 1 Kg approx.

UNE-EN 196-1, EN 196/3, 413-2, 459-2, ISO-679, UNE-80.101, ASTM-305
D052 Planetary mixer. This very robust mixer is expressly designed for the efficient mixing of cement pastes and mortar,
with **three** automatic sequences of mixing cycle, in compliance with: EN 196-1, EN 196-3:2005, EN 480-1 **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 (EN 196-1 program). Complete with safety door conforming to CE Safety Directive; if opened it automatically stops the machine.
Supplied complete with stainless steel bowl, but **"without beater"** which has to be ordered separately (see mod. D053.01 or D053.02).
Power supply: 230 V 1ph 50 Hz
Dimensions: 340x460x700 mm
Weight: 45 Kg

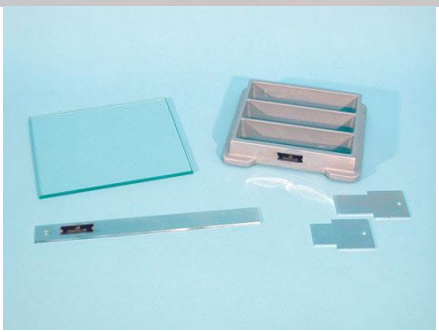
AUTOMATIC MORTAR MIXER
EN 196-1 / EN 196-3 / EN 412-2 / EN 459-2 / EN 480-1 / UNE 80801/83258 / EN ISO-679 / NF P15-314
D053 This very robust mixer is expressly designed for the efficient mixing of cement pastes and mortar,
with **three** automatic sequences of mixing cycle, in compliance with: EN 196-1, EN 196-3:2005, EN 480-1 **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 (EN 196-1 program). Complete with safety door conforming to CE Safety Directive; if opened it automatically stops the machine.
Supplied complete with stainless steel bowl, but **"without beater"** which has to be ordered separately (see mod. D053.01 or D053.02).
Power supply: 230 V 1ph 50 Hz
Dimensions: 340x460x700 mm
Weight: 45 Kg

Accessories:
D053.01 Stainless steel bowl, capacity 5 l.
D053.02 Stainless Steel beater with bayonet fittings
D053.03 Sand bags standard in 1350 g. according to EN 196-1

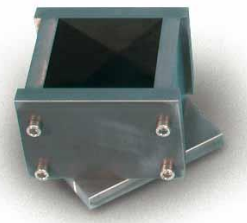
UNE-EN 196-1, 413, 459, ISO-679, UNE-80.101
D055 Three gang mould completely removable for preparing manufactured prisms of 40x40x160 mm. Steel construction fully rectified. All parts of the mould part are numbered for ease of assembly.
Internal dimensions: 40.0 ± 0.4 x 40.1 ± 0.3 x 160.0 ± 0.8 mm. (Width x Depth x Length)
Weight: 8 kg



Accessories:
D055.01 Feed hopper, made of aluminum.
D055.02 Large and small scraper to EN 196-1
D055.03 Straighe edge 300 mm long.
D055.04 Glass plate 200x200x5 mm to cover the mould



NF P18-401
D056 Three gang mould completely removable for preparing manufactured prisms of 70.7 x70, 7x282, 8 mm.
Weight: 8 kg



BS 4550
D057 Cubic mould totally removable, for preparing manufactured cubic specimen of 70.7 x70, 7x70, 7 mm.
Weight: 3 kg

Vibrating machine for 70,7 mm cube moulds
Standard: BS 4550
D059 The mould is mounted on a vibration platform with excentric mechanism. The machine is supplied complete with separate control panel with timer, but **"without cube moulds"** to be ordered separately.

Power supply: 230V 1ph 50 Hz 250 W
Weight: 100 Kg

JOLTING APPARATUS AUTOMATIC
UNE-EN 196-1/ UNE 80.101/ ISO 679/ NF P15-413/ BS 3892
D061 Used to Compact cement mortar prisms, constructed to compaction moulds triple 40x40x160 mm. Driven by an electric geared motor to raise the top board at a rate of 60 beats / minute, dropping in free fall from a height of 15 mm. Equipped with an electronic system that allows programmed to 60 beats / minute in the test required, with automatic stop. The table assembly, cleat arms and has a total weight of 20.0 ± 0.5 kg Supplied complete with control module with digital number of tiers. On-off switch.
Power supply 220 V, 50 Hz

Accessories:
D055 Three gang mould specimens 40x40x160 mm mortar.
D055.01 Feed hopper 4x4x16 cm. aluminum
D055.02 Large and small scraper to EN 196-1

SPECIMEN CURING CHAMBER
EN-196-1/ UNE 80.102/ ASTM C87, 109, 190, 191/ EN ISO 679
D070 Moist wardrobe curing and preserving specimens of mortar and concrete under conditions of temperature 22 ° C ± 2 ° C and humidity up to 100% RH (adjustable) controlled by the control panel and PT100 sensor with digital displays for temperature and humidity programmable and switch-off. This has a heating and humidification, dehumidification to 65% RH (optional) and automatically regulated refrigeration equipment, which keeps these two parameters within the programmed values. Given the compact design is ideal for testing laboratories where space is a constraint. Since its installation is simple, this makes the wet locker on a laptop. Comes complete with 4 shelves specimen stainless steel. The doors can be double or sliding sheet.
TECHNICAL DATA
External dimensions: 1,320 x 500 x 1,550 mm h. Approx.
Power supply: 220V, 50Hz 750W
Empty weight approx.: 120 kg approx.
REGULATION
Temperature range from 18 ° to 40 ° C.
Relative humidity range: up to 100% (saturation)
Temperature Stability: ± 0.5 ° C
RH Stability: ± 2%

D070.01 Dehumidifier

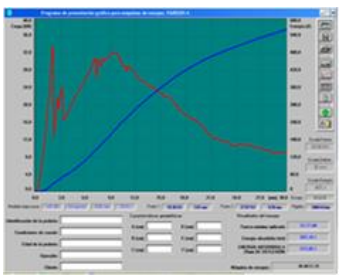
COMPRESSION AND FLEXURAL TESTING MACHINE "HIGH PERFORMANCE" WITH DUAL TESTING CHAMBER AND TWO INDEPENDENT MEASURING RANGES 300 KN AND 15 KN WITH LOAD CELLS
EN-196-1/ EN ISO 679/ ASTM C109, C348, C349/ NF P18-411, P15-45/ UNE 80101, DIN 1164/ BS 3892, 4550, 4551

D075 Automatic testing machine with dual independent test area and double piston for 300 KN and 15 KN capacity for compressive strength - Bending, standardized specimens of cements, mortars 40x40x160 mm. EN 196-1, 80101 UNE governed by computer module generation with a high-performance microprocessor, showing the graph during the test process. Made with high quality components to test compression / flexural specimens 4x4x16 cm. or other assays, as long as not exceeding the capacity of the machine. Using compression devices / flexure. There are two load cells with high accuracy.

MEASUREMENT AND CONTROL SYSTEM USING PANEL (Automatic)

The control panel is operated by an electronic microprocessor which performs servo control of the test machine closed loop driven digitally via an external personal computer. The high speed of the computer, allows you to make very precise control of the actuator of the testing machine and digital filtering allows maintaining high resolution and stability in the signs of the variables of reading.
The electronic module holds several key functions:
• Receive the steering commands entered from the computer
• Establish communication with the computer to communicate the state of the media in real time
All necessary control and display is performed via a computer program working under Windows interface.

SPECIFICATIONS:
Load cell: 300 and 15 KN
Light between plates: 310 mm.
Plate diameter: 165 mm.
Accuracy: ± 0.1
Dimensions: 1800x500x700 mm approx. (Excluding the computer table)
Power supply: 380 V III + N + T
Weight: 400 kg approx
Supplied with the latest computer flat screen, computer table, screen test area protection, Software CD overall test program and instruction manual in Castilian.
The flexion-compression devices must be ordered separately



UNE-EN 196-1/ UNE80.101/ ASTM C349/ EN ISO 679/ NF P15-451
D080 Compression Device for portions of prism mortar specimens 40 x 40 x 160 mm. with compression plates of special steel

UNE-EN 196/ EN ISO 679
D081 Flexure Device for tests mortar specimens of 40 x 40 x 160 mm. The device is placed between the plates of the machine.

COMPRESSION AND FLEXURAL TESTING MACHINE
UNE EN 12697-34 / UNE 103.502 / EN 13108 / ASTM D1559 / BS 598:107
D029 Machine capacity 50 KN for flexion-compression tests (while not exceeding the capacity of the machine). Manufactured by a sturdy frame with two columns chrome. The upper deck where it engages the load cell and the swivel plate serves as closure of the test frame. This can be positioned at will with locking system. Operation via the gear motor to the load applied by a spindle at constant speed. It has dual limit. Control module available with digital display with two display to measure the force, deformation or penetration and potentiometric sensor for measuring strain or specimen thickness. Comes complete with protective screen test area.
Capacity: 50 KN.
Dimensions: 1550 x 500 x 450 mm.
Distance between tie bars: 300 mm.
Power: 220 V, 50 Hz

Accessories:
D029.03 Metal structure for the positioning of the machine

CEMENT COMPRESSION MACHINE 500 KN, CYBER-PLUS EVOLUTION
Compression machine 500 kN with Cyber-Plus evolution control unit (semi-automatic model).
Designed to perform compression tests on portions of prism 40,1x40x160 mm, cubes side 40, 50, 70, 100 mm and 2"; cores with max. height of 180 mm, by using the suitable compression devices described in next pages (accessories mod. D080).

- Two columns high stiffness frame.
- Max. vertical daylight between platens: 185 mm
- Platens diameter: 153 mm
- Ram travel: 45 mm approx.
- Accuracy: Grade 1 starting from 1/10 of the scale
- Supplied complete with lower compression platen and coupling piece to easily fix the compression device.
- Power supply: 230V 1ph 50Hz 750W
- Weight: 300 - 330 kg

ACCESSORIES:
CONSOLE HOUING THE SERVO-PLUS EVOLUTION
D104.04 The pump assembly and the digital system are encased to enhance the design and look of the machine

Machine motorized system Cyber-Plus Evolution 500 KN capacity

D090

Machine motorized system Cyber-Plus Evolution 250 KN capacity

D091

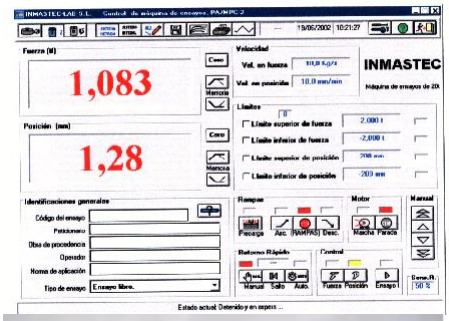
Machine motorized Servo-Plus Evolution, 250 and 500 KN capacity

D092 / D104.04 (Console Housing)

UNIVERSAL MACHINES (MULTIPURPOSE) ELECTROMECHANICAL FLEXURAL, COMPRESSION AND TEMSILE TEST
EN 13286-47, EN 196-1/ UNE 103.502, 67100-85/ ASTM D1833/ AASHTO T193/ BS 13772:4/ NF P94-078
Electromechanical multitest load, automatic compact to 200 or 300 KN capacity for compression-deflection tests mortar specimens CBR and Marshall tests, compression tests on flexural materials and vials, with load cell, microprocessor console managed by latest computer. Actuating speed is adjustable between 0.1 mm. / Min and 100 mm. / Minute and 0.1 Kg. / Sec. and 1000 Kg. / sec. The machine has an on-off switch, limit switch and emergency stop button.
Supplied complete with microprocessor management module, computer and manual (grips for tensile trial not included).
• External dimensions: 2200 x 1200 x 500 mm.
• Distance between plates: 700 mm.
• Distance between columns: 620 mm.
• Piston stroke: 0-400 mm.
• Maximum force: 200 to 300 KN.
• Resolution of force: 1 N
• Displacement resolution: 0.01 mm.
• Magnetothermal switch
• Power indicator light.
• Frame Weight: ≈ 900 kg approx.
Power supply: 220V AC, single phase over ground
S155 Universal machine capacity of 200 KN
S156 Universal machine capacity of 300 KN

Accessories:

S155.05 ENAC certificate calibration with issuance "in situ" for machines (budget request).
S155.01 Load cell 50 KN capacity on machines for coupling with corresponding couplings.
E015 Set manuals holder jaws. This equipment is designed to be used with the multiensayos presses depending on the capacity of each machine.
Supplied with two sets of pliers, one flat and one round for V.
Forceps flat: for flat specimens of 0 to 10 mm thick
Round tongs: 0 to 7 mm in diameter.
Tweezers in V: for round specimens from dia 8 to 14 mm.
Note: The machine does not include flexural device, which must be ordered separately



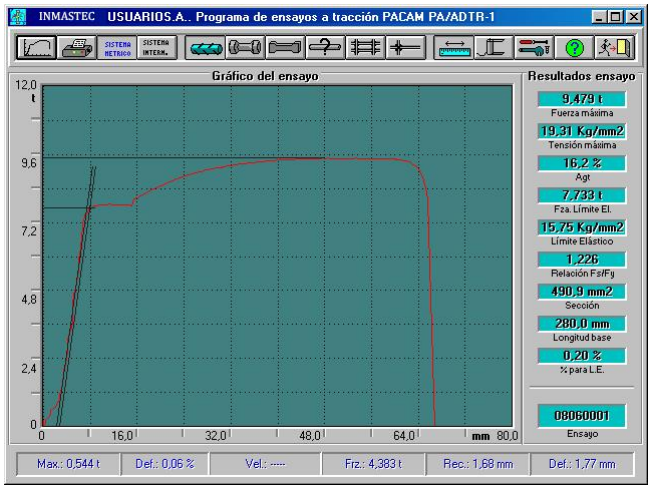
GROUP I&S

Steels

GROUP I&S

GRUPO I&S

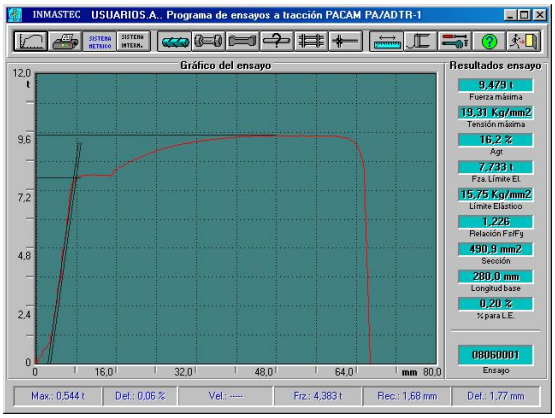
UNIVERSAL HIDRAULIC SERVO-CONTROLLED MACHINE AUTOMATIC TENSILE, COMPUTERIZED CONTROL SYSTEM DRIVEN
EN 10002/ UNE 36-068/96/ EN-ISO 6892, 7500-1 / ASTM A370/ DIN 50.125



TENSILE STRENGTH, YIELD STRENGTH, ELONGATION AT BREAK AND FOLDING / UNFOLDING, EN-10002, UNE 36-068/96 UNIVERSAL TESTING MACHINE DRIVE, HYDRAULIC, PNEUMATIC CHUCK JAWS FOR STEEL BAR TEST RUN BY ART MICROPROCESSOR AND GOVERNED BY COMPUTER

E001 The test frame comprises two bridges firmly chrome armed by two columns. The lower deck is equipped with hydraulic screw approximation of jaw with a vertical movement. The second jaw joint load cell is attached to piston top bridge that allows its displacement exert traction force on the steel specimen. To measure the traction force, a load cell by an electronic signal determines the force exerted. The regulation of the force exerted by the piston performs a proportional servo valve to the pressure delivery piston proportionally. Once broken probe detects the machine stops automatically.

The longitudinal strain of the specimen can be determined by two methods (optional):
-By extensométicas bands (not included)
-By clamping extensometer (not included)
The control of the machine operates in closed loop so getting a highly accurate increase.



The team consists of the following elements:

• Test Framework, consisting of frame, columns, piston and jaws.
• Hydraulic
• Load cell
• Air Compressor
• Wire transducer for measuring deformation
• Proportional servo valve
• Pneumatic jaws composed for 3 set different diameters of bars
• 2 channel control module + additional channel extensometer
• Complete package software tensile steels.
• Control Desk for the placement of the computer and which is housed inside the control module and hydraulic.

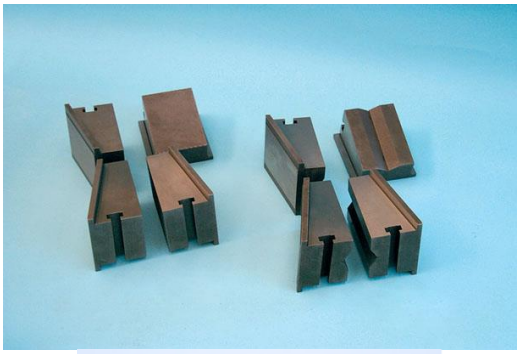
TECHNICAL FEATURES

• Capacity: 700 KN.
• Piston Stroke: 600 mm. (300 mm above and 300 mm bottom)
• Accuracy of force: <1% of applied load between 2 and 100% of nominal.
• Speed Accuracy: Better than 1%
• the spindle Displacement: Automatic by computer control or manual operation
• Working speed: Kg / mm. / S. (Depends on the section of the specimen, as the calculation is done by the software automatically)
• Diameter of columns: 110 mm. ↗
• Ideal distance between jaws for test: 600 mm.
• Sidelight between columns useful: 430-440 mm.
• test frame Dimension: 950 x 500 x 3150 mm. (Width x depth x height) + computer table
• Power supply: 230V or three-phase 380 V, 50 Hz ± 10%

The machine is supplied complete with the following components also as accessories including:
• Program Package tensile steel
• art computer keyboard
• Manual in English, software manual and certificate of conformity

E002 Universal tensile machine similar to E001 model, but of 1000 KN capacity.
E003 Software elastic modulus
E004 Universal machine twin screw

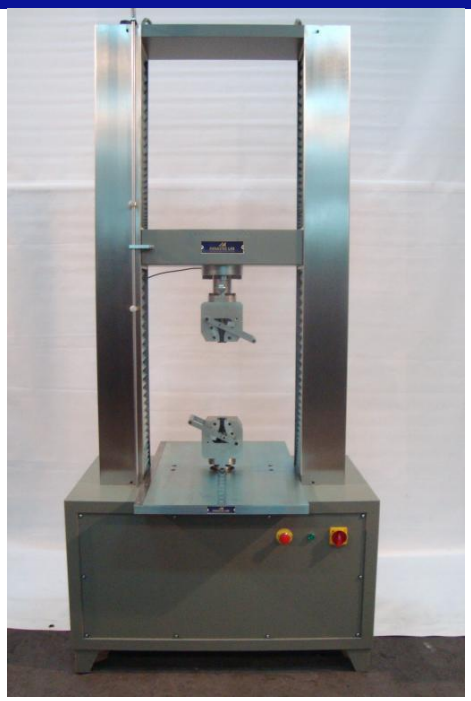
E001.01 Set of jaws, upper and lower for flat specimens dia 0 to 15 mm. (4 pcs.).
E001.02 Set of jaws, upper and lower for round specimens dia 12 to Ø25 mm. (4 pcs.).
E001.03 Set of jaws, upper and lower for round specimens dia 22 to Ø32 mm. (4 pcs.).
E001.05 Calibration certificate issuance ENAC Traction Machine performed
E005 Extensometer pinch of Class 1 ± 2.5 mm.
E006 Device for welded steel mesh
E007 Strain gage Kit with accessories for your stuck.
E008 Extensometric bands (5 units).
E005.01 Length basis Adapters of 100 mm



This machine has the possibility of coupling a variety of devices for both compression tests, flexural tests as for traction. (See accessories).

S162 Electromechanical machine double piston model similar to S160, but capacity of 200 KN

UNIVERSAL TESTING MACHINE
S160 Electromechanical machine double piston
Automatic testing machine and servo twin screw latter governed by computer generation, comprising a rigid structure with loading bridge motherboard movable bridge guided by two columns of chrome steel. Serv-electromechanical drive engine by two ball screws and re-circulating provide outstanding smoothness of operation and a constant speed during the test.
Rigid inner bridge high resistance load houses the assembly formed by the screw, the electromechanical group and press control module.
Load cell (tension-compression) mounted on the upper bridge, which the control module transmits the force exerted at each test point. The regulation of the travel speed and the loading speed of the spindle is processed by the electronic module.
The compression plates are hardened and ground, the bottom of Ø 220 mm. is marked concentric, very helpful for correct positioning of the jaw Marshall, among other applications. The system includes an upper ball joint that allows perfect fitting.
TECHNICAL FEATURES:
Capacity: 300 KN.
Resolution of force: 1 N
Displacement resolution: 0.01 mm.
Useful light horizontal: 620 mm
Sandy Bridge mobile standard: ± 1500mm.
Stiffness test frame (combined) exceeding 1 mm. / 300KN.
Power supply: 220V AC, single phase more grounded.
Power: 1500 W
Weight: 700 kg approx.
The machine is supplied complete with load cell of 300 kN.
General Testing Software, last generation computer flat screen and user manual in inglish.

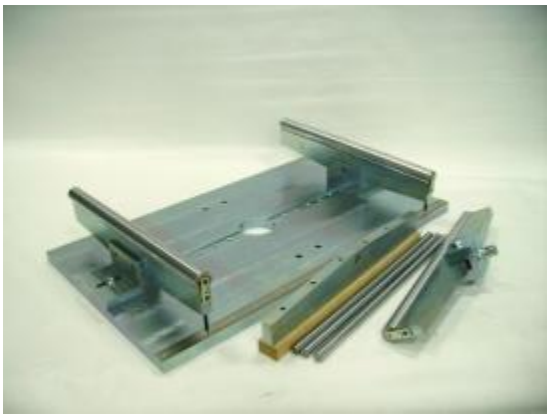


UNIVERSAL TESTING MACHINE
S164 Electromechanical machine double piston Automatic testing machine and servo twin screw governed by computer model last generation similar to S160, but with carrier jaws for testing tensile steel bars.

E015 Set manuals holder jaws. This equipment is designed to be used with the multiensayos presses depending on the capacity of each machine.
Supplied with two sets of pliers, one flat and one round for V.
Forceps flat: for flat specimens of 0 to 10 mm thick
Round tongs: 0 to 7 mm in diameter.
Tweezers in V: for round specimens from dia 8 to 14 mm.

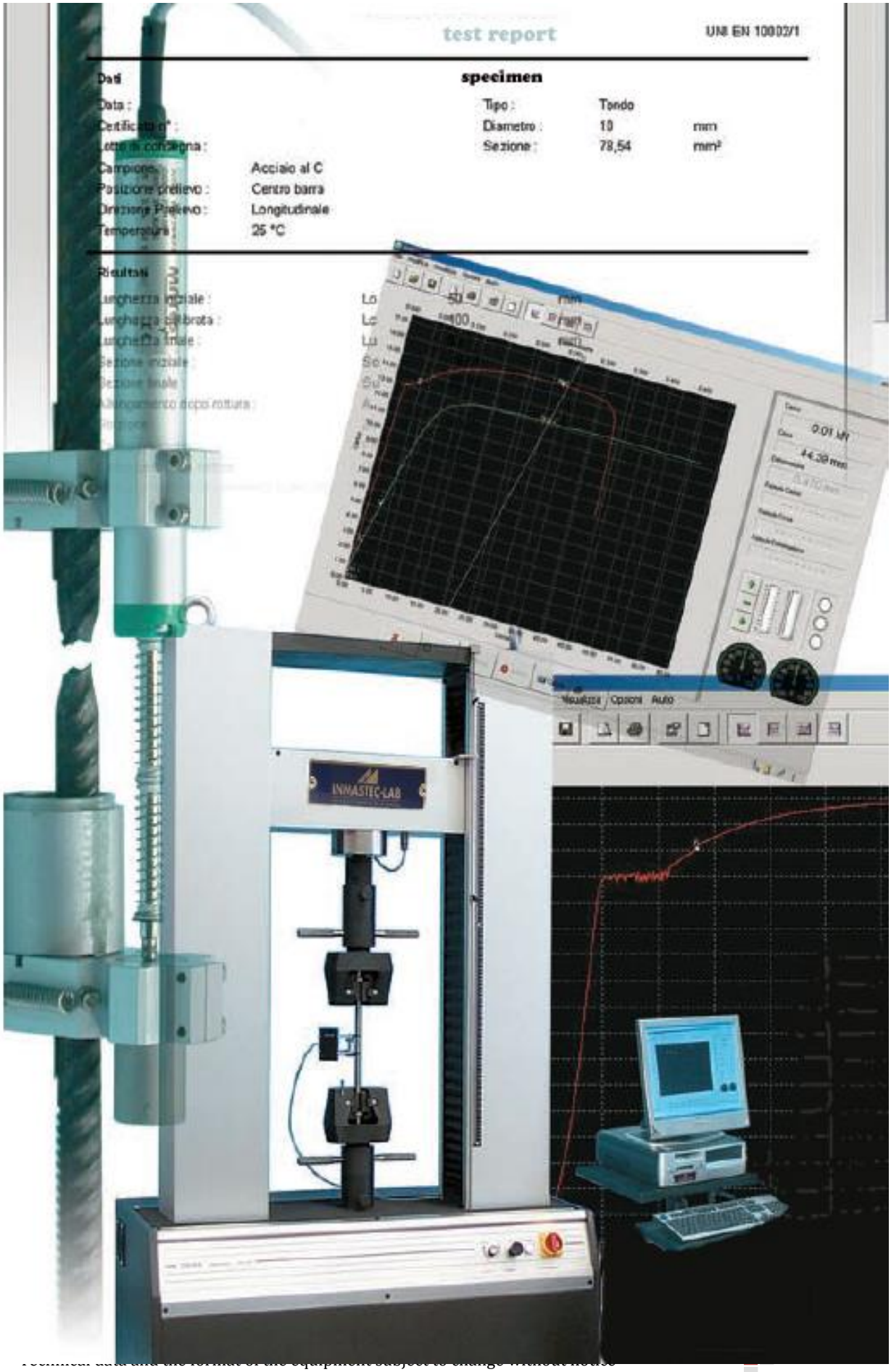
E016 Round grips V from dia 15 to 22 mm.

UNIVERSAL TESTING MACHINE
S164 Electromechanical machine servo automatic double piston, ruled last generation computer model similar to S160, but with flexural device for curbs and tiles, flat blocks, roof tiles bending, etc..



S166 Flexural testing device. Equipment that can be attached to a multitester machine That allows testing transverse curbs and tiles, flat blocks, tiles flexural, etc.
Weight: 210kg.

S160.04 Safety guards CE for area and perimeter security test support multitester machine.


test report
UNI EN 10002/1
specimen
Tipo : Tondo
Diametro : 10 mm
Sezione : 78,54 mm²
Acciaio al C
Centro barra
Longitudinale
25 °C
INVASTEC-LAB

SERVO-CONTROLLED ELECTROMECHANICAL "TOUCH-SCREEN" UNIVERSAL TESTING MACHINE, 200 KN.

MAIN FEATURES

Standards: EN 10002 / EN ISO 6892, 7500-1 / ASTM A370

The machine is composed by a strong base containing the transmission components and the Hardware control instruments.
The base carries two colums 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 tets with single direction or dual direction.
In order to grant no clearance, the transmission of the movement to the modile cross-bar takes place through two re-circulating spheres screws with 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 UNE ISO 5893 Standard).
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 conformity with the EN 10002-2 / EN ISO 6892, 7500-1 Standards.

E017+E019+E019.01

Features of the load cell referred to ISO 376 Standard

- Load capacity: 200 kN
- Test speed: Minimum 0.01mm/min - Maximum 480 mm/min
- Positioning speed: 480 mm/min
- Cross bar travel (*): 1150 mm/min
- Opening of the testing chamber: Vertical (**) 1280 mm
- Horizontal 600 mm
- Maximum distance between the tensile heads (***): 480 mm
- Dimensions in mm: 2340 (height) - 1370 (width) - 700 (depth)
- Weight: 1150 kg
- Power supply: 400V 3ph 50Hz
- Absorbed power: 3000 W

.

The control section is made by a deries of cards inside the base of the machine that are managing the control units and the reading units positioned on the machine.
The adquisition card, with a powerful microprocessor and converter AD 24 bits, takes all the working dates and through a RS232 connection it sends all these to the Personal Computer, wich controls all the functions of the machine and makes the elaboration of all the calculations through the program UTM2

On the base there are:
A deice 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 awitch
For further information, please consult the category **electromechanical servo-controlled universal machines for tensile tests on steel**.

NOTES:

(*) 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.

NOTE: The software and the extensometer are described at pag. 131

Ma

E018

E014

MODEL	E014	E015	E016	E017	E018
Capacity (kN)Load	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	250
Cross-bar travel. (*) mm	1130	1130	1180	1150	1500
Opening of the testing chamber Vertical mm (**)	1253	1251	1310	1280	1510
Horizontal mm	421	421	600	600	713
Maximum distance between the tensile heads mm (***)	630	612	510	480	550
Dimensions (mm) Hight	1708	1845	2340	2340	3000
Width	550	810	1370	1370	1465
Depth	683	670	700	700	930
Weight kg	250	370	1000	1150	2600
Power Supply	230V 1F 50 Hz	230V 1F 50 Hz	400V 3F 50 Hz	400V 3F 50 Hz	400V 3F 50 Hz
Power (W)	1000	1200	2000	3000	3000

NOTES:
(*****) 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.

ACCESSORIES FOR MOD.
E014 a E018:
E014.05 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 graphs the coefficient of elasticity together with the loads RP0.1 - RP0.2 - Rt1 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.

E014.05

Eelectronic Extensometer for tensile deformation strength tests until breakage
E014.07 This electronic coaxial extensometer is used to measure the deformation of a specimen under tensile test until breakage.
The extensometer is directly fixed to the test specimen and it remains connected until breakage, by measuring the deformation both in the elastic and in the plastic phases.
Measuring bae for round specimens: 5 x specimen diameter.
Supplied complete with 4 spacers for the intermediate sample diameters of the specific measuring range, connection cable, accessories, carying case.

E014.06 Extensometer for round specimens from 4,5 to 11 mm diameter. Transducer stroke: 25 mm
E014.07 Extensometer for round specimens from 10 to197 mm diameter. Transducer stroke: 50 mm
E014.08 Extensometer for round specimens from 18 to 27 mm diameter. Transducer stroke: 50 mm
E014.09 Extensometer for round specimens from 26 to 36 mm diameter. Transducer stroke: 50 mm
E014.10 Extensometer for flat specimens' width max. 25 mm; thicknesses max. 10 mm.
Measuring base: 25 – 50 - -60 – 70 mm. transducer stroke: 50 mm.

Cold bend testing mechine
UNE 36068/ ASTM A615/ ISO 7438, 15630-1
E025 This equipment has been studied and designed to carry out bending tests on steel bars for reinforced concrete.
Bending Machine and Bar split corrugated steel and other steel mills to determine the suitability of plastic deformation. Constant speed by the spindle approximation. Drive backward and forward with the accelerator pedal. The unit is supplied with standard mandrels temperate and according to UNE, of Ø 250 - 200-160 - 128 - 96-112 - 84 - 72-60 - 50 - 48-40 - 36 - 30 mm. Hydraulic and protective screen test area. Motor power: 1.5 C.V. 1500 r.p.m. Food 380 V.
Dimensions 1750 x 620 x 900 mmh.
Maximum bending dia: 32 mm.

UNE EN 1289/1M
PENETRATING LIQUID WELDING TEST
he penetrant inspection to detect failures in the welds. After cleaning the surface of the piece to be inspected from any contamination, general dirt and grease. Penetrating the product is applied. If there is a crack or defect whatever their size, the liquid is introduced by it by default. To clean the piece penetrant is applied liquid called another developer that is highly absorbent.

E030 Red Penetrating Aerosol 996p.
E031 Aerosol revelador PD1B
E032 Aerosol Developer 9D1B

Marking-Off machine

E033 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 400 V 3ph 50 Hz
Dimensions: 530x480x445 mm.
Weight: approx. 58 Kg

PENDULUM IMPACT CHARPY TESTERS FOR RESILIENCE TESTS
EN 10045-1/ ASTM E23/ BS 131/ DIN 50115

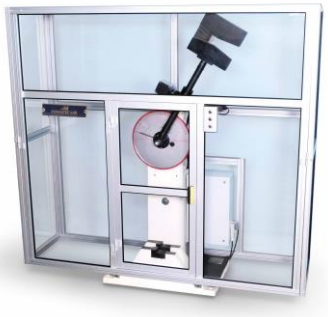
E035 Pendulum impact Charpy tester hand operated. The tester is equipped with a falling pendulum hammer, able to break, with a single blow, a sample carved in the middle and positioned on two supports.
The test is carried out on a CHARPY sample in order to check the energy absorbed during the impact, 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°, Pendulum mass kg. 21,300
- Impact speed: 5,187 m/s

Supplied complete with knife-edge to perform the test as per ASTM Standard
It cannot be sold in CE markets
Dimensions: 500x1000xh1820 mm. Weight: 400 kg approx.

E035

E036 Pendulum impact Charpy tester, 300 J capacity, motorized semi-automatic workingand high energy capacity. Supplied complete with protección cage to CE.

E036.01 Pendulum impact Charpy tester, 300 J capacity resolution 0,1 , motorized, digital, high performance**.** Fully automatic working with immediate arm repositioning.
Machine for resilience tests with high impact energy.
Suitable for steels and alloys with high resilience values.
Data acquisition to PC through Software.
Safety cage aluminium and plexiglass made, with mechanical safety and microswitch blocking the door when the arm is inserted.
Impact energy: 300J with 0,1J resolution.
Supplied complete with knife-edge to perform the test as per ASTM Standard.
Power supply: 380V 3ph 50Hz 400W
Dimensions: 2200 x 800 xh 2300 mm. Weight: 750 kg
.



E036

Accessories:

E035.01 Protection recommended to meet the safety requirements as CE. Enclosure protection throughout its length made of steel.
E035.04 Knife-Edge to perform resilence tests according to EN 10045-1, BS 131 standards for E035
E035.04 Knife-Edge for E036 and E036.01

E040 Hardness Rockwell optical universal standard assays (HR), Brinell (HBW) and Vickers (HV) 8 test loads: 10 - 30 to 31.25 - 60 - 100 - 150 mm and 187.5 Kgf
Optical microscope and 75x 37.5 x Measuring
Footprints for HB-HV according to standards: ISO 6508 (HR) + ISO 6506 (HB) + ISO 6507 (HV) ASTM E-18 + (HR) + ASTM E-10 (HB) + ASTM E-92 (HV)
TECHNICAL SPECIFICATIONS:
Kgf test loads: 10 - 30 to 31.25 - 60 - 62.5 to 100 - 150 and 187.5
Test loads in N: 98 - 294-306 - 586 - 588-613 - 980 - 1471 to 1839
Loads Accuracy: ± 1%
Test loads Rockwell Average: 10 - 60 - 100 - 150 Kgf.
Vickers test loads: 10 - 30 - 60 - 100 Kgf.
Brinell test loads: 10 - 30 to 31.25 - 62.5 to 187.5 Kgf.
Microscope Total Magnification: 75x 37.5 x and
Maximum height of test piece: 200 mm.
Cleavage from the penetrator axis: 200 mm.
Dimensions Approx: 546x300x767 mm.
Net Weight: 90 Kg Approx
Red Electrical connection: 220V, 50 Hz single phase

DESCRIPTION:
The universal optical durometer HBRVU Mod., 5 is a test machine with very high precision. Its use is recommended in laboratories Factory and Research Institutions, as well as colleges and universities, for the determination of the hardness Rockwell, Brinell and Vickers all types of ferrous and non ferrous materials, hard alloys, carburadas layers and nitrated, electrolyte layer, etc..

FEATURES:
Body casting. Gray stabilized Robust
Spindle assembly. Precision approach Tureca-Volante.
Infeed axis, linear bearing equipped, very little friction.
Loading mechanism. For weights calibrated, high accuracy guaranteed.
Automatic load selector by turning external control.
Load drive, manual, application and removal of external handle.
Cruise control, hydraulic control equipped with cruise control.
Rockwell display with backlighting and vertically sliding scale.
Microscope HB + HV, incorporated durometer lighting provided.
Ocular micrometer analog 15x
Two optical lenses, interchangeable 2.5x and 5x.
Increases microscope, 75x 37.5 and
On and off: by external switch (OFF-HB-HR-HV-OO).↩

STANDARD ACCESSORY EQUIPMENT (INCLUDED) IN SUITCASE DUROMETER:

5 Weights calibrated 1-2-3-4 + Pesita No. No. 0
1 Rockwell diamond indenter, diamond cone 120
1 Vickers diamond indenter, Pyramid diamte of 136 º
1 steel ball indenter Rockwell 1/16 "Ø + 6 spare ball
1 Brinell Penetrator Tungsten carbide ball 2.5 mmØ
1 Brinell Penetrator Tungsten carbide ball from 5.0 mmØ
3 Patterns of Brinell hardness HBW 2,5 / 187.5
1 Pattern of Vickers hardness HV
1 table smooth flat circular recessed fixture 150 mmØ
One flat circular smooth workpiece table 60 mmØ
1 table fixture Circular prism "V" 40 mmØ
1 Cable Networking
2 Fuses Ø5x20 ª 0.5 mm (Replacement)
Illumination 6V 15W 2 Lamp (Replacement)
1 Instruction Manual + method + tables tables HB and HV
* We have different models durometers, consult

Soils

GROUP I&S

GROUP I&S

SAMPLE SPLITTERS (RIFFLE BOXES)
UNE EN 933-3 / ASTM C136, 702 / NF P18-553 / BS 1377:2, 812:1, 1924 :1

Sample splitter for classifying samples into representative portions of materials such as: aggregates, sand, gravel and simlae. They are made of sheet steel painted. Supplied with three collecting pans (from ¼ "to 1 ½")

Códe	Slot width	Slot Number
S001	¼" - 6,3 mm	14
S002	½" – 12,5 mm	14
S003	¾" – 19,1 mm	16
S004	1" – 25,4 mm	14
S005	1½" – 38,1 mm	12
S006	2" – 50,8 mm	10
S007	3" – 76,2 mm	8

S010 Large capacity sample splitter
Designed for the reduction of test samples which are too large in volume to be conveniently handled. It handles any material from sand sizes up to dia. 108 mm. Each chute bar is 12 mm wide so that openings of 12-24-36-48-60-72-84-96-108 mm are possible. Complete with two collecting pans.
Clam shell hopper: 30 litres capacity.
Very sturdily constructed, it is totally cadmium plated for rust protection.
Weight: 55 Kg

SOIL SAMPLER

S012 Used to obtain indisturbed 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 9 " (38 x 230 mm)

Weight: 7 Kg.

Accessories:
S012.01 Hand extruder used to extrude the soil specimens Ø38 mm.(1½") from the sample tube.
S012.02 Stainless simple tube dia 1½"" x 9" (38x230 mm).

SOIL SAMPLING
ASTM D420, D1452/ AASHTO T86, T202

Designed for soil investigation and explorations. Complete with "T". handle.
Made of special galvanized steel

S013 Hand Auger Ø80 mm, x 1 m larg.
S014 Hand Auger Ø100 mm, x 1 m long.
S015 Hand Auger Ø150 mm x 1 m long.
S012.03 Extension rod for above 1 m. long

S014 Equipment sampler consists of a cylindrical cutting edge of Ø130x130 mmh. Made of steel with anti-corrosion treatment. Comes complete with wooden mallet to hit.

SURFACE SOIL SAMPLERS
ASTM D2973/ BS 1377:97 CNR N°22

Surface soil sampler with sampling tube 73 mm inside diameter x 66 mm long and 5 kg. drop hammer.
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.
Steel made, galvanized against corrosion.

S015 Soil sampler tube Ø73x66 with mmh int. And 5kg hammer

FINE AGGREGATE SURFACE MOISTURE
ASTM C70 / AASHTO T142

A125 Chapman flask to determine surface moisture in fine aggregate.
Graduated to 200 mL between two bulbs and from 375 to 450 mL from the second bulb.
Weight: 500 g

Accessories:
A125.01 Box for flask chapman
V233 Maximum and minimum thermometer

UNIVERSAL EXTRUDER
UNE 103.400 / ASTM D698 / BS 598, 1377
S123 Hand operated actuated by a 5 tons hydraulic jack. 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.
Supplied complete with adaptors.
Dimensions: dia. 300x500 mm
Weight: 30 Kg

UNE 103.400/ ASTM D698, D1587, D1883/ BS 598, 1377:4
S024 Universal Extruders hydraulic piston for soil samples from dia 35 up to 150 mm with different numbers of adapters to Ø 150 mm. and corresponding piston heads and securing ends.
Technical Feature:
Max. load: 70 KN (7000 Kg)
Maximum sample diameter: 150 mm.
The extraction rate: constant 120 and 1,200 mm / min.
dimensions:
Power: 220V, 50 Hz
Weight: 250 kg
The support team has a collection of sample is placed in a horizontal position to keep the sample. Supplied with a head and a diameter collars (to choose). Emergency button has.

Accessories:
Adaptors for Extruders:
S024.01 Ø38,1 mm
S024.02 Ø50,8 mm
S024.03 Ø76,2 mm
S024.04 Ø 101,6 mm
S024.05 Ø 83 mm(disc)
S024.06 Ø100 mm(disc)
S024.07 Ø 35 mm
S024.08 Ø150 mm

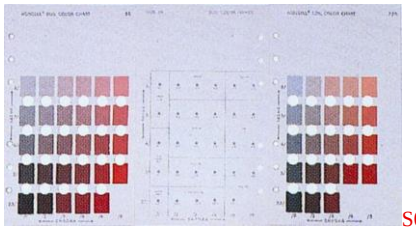
S022 Calcium carbide, box 100 ampoules

Determination of Moisture Content
ASTM D4944/ BS 6576/ AASHTO T217
Speedy equipment to determine quickly and accurately the moisture content in soil mixtures and pastes, clay, sand or other granular materials.
The operating principle is based on the reaction between water and calcium carbide, which produces a gas amount directly proportional to the amount of water present in the sample.
Model:
S020 Speedy apparatus complete with pressure gauge, balance, hammer, dishes, cleaning brush and carrying case.
Measuring range: 0-20%
Ability to show: 5-100 g.
Dimensions of case: 450x350x150 mm
Weight: 5 kg approx.

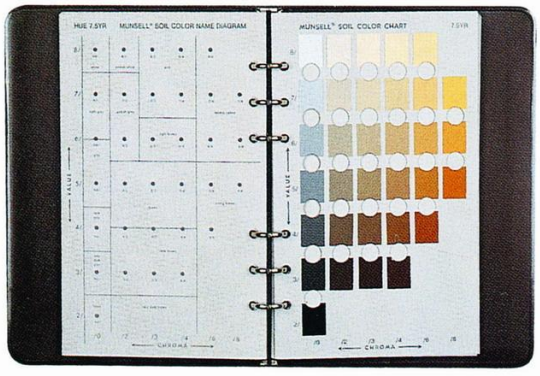
ASTM D1067/ BS 1377

S025 Colour matching charts for identification, The set consists of 7 constant hue charts with 196 colours.

S026 Tropical soil colour chart, Set of 2 cards and colour name diagrams.



S026



PORTABLE PH METER

S028 Accurate, compact model, LCD display, microprocessor controlled. It can measure pH, mV and temperature in the laboratory and in the field. Measuring range of 0-14 pH; 0-1999 mV, temperature 0 ° to 80 ° C. Supplied complete with solutions (pH 4, 7 and KCI) electrode and ATC (Automatic Temperature Compensation) in a carrying case.
Dimensions: 185 x 45 x 80 mm.

Accesorios:

S028.01 Electro glass body, 0 ... 80 ° C

S028.02 Electro stainless steel

PH METER OF ON-BOARD

S029 Alphanumeric backlit LCD display, microprocessor controlled. Flexible arm. It can measure pH, mV and temperature in the laboratory and in the field. Measuring range of 0-14 pH; 0-1999 mV, temperature 0 ° to 80 ° C.
Supplied complete with cable, flexible arm solutions (pH 4, 7 and KCI) electrode, magnetic stirrer and CAT (Automatic Temperature Compensation) in a carrying case.
Dimensions: 230x170x70 mm
Weight: 1.5 kg approx.

V111 Magnetic stirrer with heating maximum temperature over 400 ° C
Furniture injection, which gives great stability to the team, lacquered.
Surface agitation circular stainless steel AISI 304, Ø150mm.
Light switches and independent regulatory controls for the heating and stirring functions located on the front panel.
The stirring capacity is more than 10l. (relative to water).
Stirring speed variable from 30-2100 rpm Power: 220V, 50 Hz

LIQUID LIMIT : Casagrande method
UNE 103.103/ BS 1377:2/ ASTM D4318/ AASHOT T89
Evaluate the relationship between the moisture percentage of a soil sample and the rumber 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

S032 Casagrande apparatus liquid limit the unit comprises a removable brass cup wich through a cam device drops on a rubber base (or hard rubber base). Supplied complete with drops counter, but "without grooving tool" wich has to be ordered separaty.
Dimensions: 150x190x150 mm. Weight: 3 Kg

S033 Casagrande apparatus hand operated with mechanical metered number of strokes, standardized base, bowl (cup) smooth with drop height adjustable handle.
Weight: 3 Kg approx.

S034 Casagrande apparatus motorized drive by an electric motor 120 strokes per minute frequency. Digital display to display the number of hits. Stop Switch.
Weight: 7 Kg approx.


S034


S033


S032

Accessories:
S032.01 Casagrande grooving tool in compliance with ASTM D4318 standard, stainless steel
S032.02 Grooving tool in compliance with UNE, AASHOTO T79 standard
S032.03 Grooving tool Hovany
A032.06 Grooving tool to BS 1377:2 specification
S032.04 Stainless steel spatula with 150 mm blade
S032.05 Glass 300 x 300 x 5 mm one face frosted.
S032.10 Brass cup ASTM, BS, UNE; AASHTO
S032.11 Grooving tool, to NF P4-051
S032.13 Chromed cup NF P94-051
S032.14 Rough brass cup, with central smooth band 10 mm wide, as requested by NF P94-051used for soil having low plasticity

S037 Pocket shear vane device range 0-2 Kg / cm ²
for rapid determination of cohesive soil.
S038 Pocket shear vane device range 0-1 Kg / cm ²
for rapid determination of cohesive soil.
S042 Pocket penetrometer, designed for the rapid determination of soil consistency, shear strength and approximate Unconfined. Compression strength. Scale range 0 to 4.5 kg /cm ² with direct reading strength values. Plunger dia. 6,35 mm. Weight: 300 g.
C143 Pocket penetrometer range to 0-16 kg / cm ²

S036 Geopocket dial penetrometer, designed for a quick determination of the foundation soil, form f clay to sandy soils.
It indicates the angle of internal friction (sandy soils) and cohesion (clay soils) and the appro. Unconfined compressive strength.
Peak hold feature; zero setting by push button.
Supplieds complete with 5 plungers Ø 6,4 - 10 - 15 - 20 - 25 mm. Weight 400 gr.


C037/38


C042

HYDROMETER SEDIMENTATION METHOD

S045 Lomi high speed agitator consisting of an engine that reaches 6,000 rpm, stainless steel propeller placed on the motor shaft.
The equipment is supplied complete with holder and stainless steel cup. 0.8 l. capacity.

S045

S046

S046 Electronic mixer with digital display, speed control between 200 - 2000 rpm. Supplied with stir, support and locking nut.

S047 Immersion thermostat heater

Features:

Resolution: 0.1 ° C
Accuracy: + / - 0.5% FS (full scale)
Temperature display: 4-digit display.
Agitation pump, capable of homogenizing the temperature in containers up to 100 liters (relative to water and the covered container).
Possibility of coupling an output pump for external circulation
Temperature control with digital thermostat.
All parts in contact with liquid are made of stainless steel AISI 304.

V017 Transparent methacrylate tray 300 x 200 x 500 mm.

S048 Soil Hydrometer of 0.980 to 1038 g / liter
S049 Soil hydrometer, range 0 to 60 g / liter

V6747 1000 ml test tube
V6804 Beaker of 250 ml capacity
V435 Digital Timer
V141684.1211 Sodium hexametaphosphate, container 1000 g

V435

S052

S052.01 Mechanical Jack 50 KN capacity

Unconfined compression tester

NORMAS: ASTM D2166 / AASHTO T208 / BS 1377:7

S052 his 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.
The S052 tester comprises:
S221 Conversion frame
S221-01 Mechanical jack 50 kN capacity
S370-02 Load ring 2 kN capacity
S131-11 Upper+lower compression platens with accessories
S376 Dial gauge 10 x 0,01 mm
S212-03 Dial gauge holder
Dimensions: 380x460x1380 mm . Weight: 68 Kg
NOTE: This machine includes some common component (like for ex. the mechanical jack mod. S052-01). It is therefore possible to combine these components for different machines, with some economical advantage.

CONSISTENCY DETERMINATION, PENETRATION BITUMEN UNE EN 1426 / UNE 104281-1,4 / BS 2000 / ASTM D5, D217 / AASHTO T49 / NF T66-004

B052 Standard penetrometer 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 an aluminium base table with levelling screws, plated vertical rod, "**micrometric vertical adjustment device**". 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, brass sample cups dia. 55x35 mm and 70x45 mm. Dimensions: 220x170x410 mm. Weight: 11 kg

B052.10 Basically structured as mod. B052 but having a magnetic controller device with electronic digital programmable timer that automatically releases the plunger head and ensure free falling of the needle during the 5-seconds test.
Power supply: 230 V 1 ph 50/60 Hz 200 W
Dimensions: 220x280x410 mm. Weight: 15 kg.

Accessories:
B052.01 Sample cup, brass made, dia 55x35 mmh.
B052.02 Sample cup, brass made, dia 70x45 mmh.
B052.03 Mirror for easy adjustment of the needle
B052.04 Ø1 Penetration needle, Ø1.00 mm
V9117 Termometer ASTM 17C (+19 ° C to 27 ° C).
B052.07 Termometer IP 38C (+23ºC to +26ºC) rad 0,1ºC

B052 B052.10

B053 B053.10

B052.05 Transfer dish, made from glass, with support

B053 Standard digital penetrometer 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 an aluminium base table with levelling screws, plated vertical rod, "**micrometric vertical adjustment device**".
The slider is brass made with free fall. The digital readout of the penetration values has readings in mm and inch, with 0,01 mm resolution, LCD 5 digits display, with zero set in any position.
Power: 1,5V battery.
The penetrometer is supplied with stop and release push button, automatic zero set, micrometer adjustment, set of weights 50 and 100 g penetration needle, brass sample cups dia. 55x35 mm and 70x45 mm. Dimensions: 220x170x410 mm Weight: 11 kg

B053 Semi-automatic digital penetrometer Basically structured as mod. B053 but having a magnetic controller device with electronic digital programmable timer that automatically releases the plunger head and ensures free falling of the needle during the 5-seconds test.
Power supply: 230 V 1 ph 50/60 Hz 200 W
Dimensions: 220x280x410 mm
Weight: 15 kg

LINEAR SHRINKAGE DETERMINATION UNE 103.104/ ASTM D4318/ BS 1377:2/ AASHTO T90

S054 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

S055 Sulfates shaker for 12 bottles of 1 liter. Its flask fastening system is adjustable and allows placing bottles of different sizes and capacity. Supplied complete with shield with micro aperture.
Speed: 50 rpm
Power supply: 380/220V, 50 Hz
650x600x850 mm

Accessories:
S055.01 Glass bottle, 1 liter capacity

PLASTIC LIMIT DETERMINATION
UNE 103.104/ ASTM D4318/ ASSHOT T90/ NF P94-051/ BS 1377 :2

S056 The plastic limit determines the lowest moisture content of a soil, by wich a sample can be rolled into threads 3 mm. dia. without breaking the same neither longitudinally or transversely.

He set complete comprises:
S032.05 Glass plate 300x300x5 mm
S056.01 Rod caliper Ø3 x 100 mm.
V274/40 Mixing porcelain dish 110 mm dia.
S032.04 Flexible spatula 150 mm. blade
B052.01 Aluminium moisture tins dia 55 x 35 mm. (qty 6)

SHRINKAGE LIMIT
UNE 103.108/ ASTM D427/ BS 1377 :2/ AASHTO T92

S057 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:
S057.01 Shrinkage prong plate, made from plexiglass material with three metal prongs.
V274/70 Glass evaporating dish, dia. 120 mm flat bottom
S032.04 Flexible spatula, 100 mm. blade
V6100 Crystallizing dish, dia. 57x32 mm
S057.02 Shrinkage dish, dia. 45x12,7 mm (2 pieces)
V6742 Graduated cylinder 25 ml capacity
S075.03 Plastic carrying case

Soil Lathe

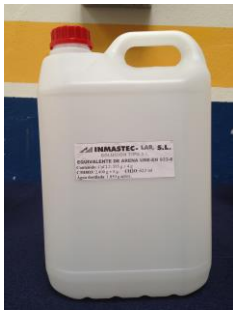
S058 Designed to reduce by trimming the diameter of a soil sample uniti reaching the desired diameter size by using a wire saw.
The lathe is hand-operated, the height is adjustable up to 230 mm, and it accepts samples from dia.38 to 110 mm.
Supplied complete with three sets of platens for samples dia.38 50,47 -60 mm, wire saw and 6 wires.
Dimensions:dia.460x720 mm
Weight:20 Kg.

S058.01 Upper and Lower trimming platen available from dia.38 to 110 mm.
When ordering please specify required diameter.

SAND EQUIVALENT TEST SET (COMPLETE)
EN 933-8 / UNE 103109 / ASTM D2419 / BS 1924 / NF XP18-598
S060 Equipment to determine sand equivalent consists of the following components.
S060.01 Plexiglass measuring cylinder engraved at 2 stripes 100 and 380 mm. square basis
S060.02 Rubber stopper for cylinder
S060.03 Irrigator tube with conical tip and holes
S060.04 Measuring of 125 ml
S060.05 Funnel wide mouth
S060.06 Weighted foot assembly for sand level
S060.07 5 L container with siphon lid
S060.08 Tubo de goma (1,5 m).
S060.09 Mohr clamp
S060.10 Graduated ruler 500 mm stainless steel
V435 Stop watch, digital
S061 Miniature sample splitters 5 mm, with three receivers
S062 Concentrated stock solution, 5000 ml.

S061 Miniature sample splittres 5 mm, with three receivers and dustpan

S062 Concentrated stock solution, 5000 ml.



S063 Motorized sand equivalent shaker
The unit provides a constant uniform shaking with automatic cycle test. Oscillating excursion is 203 mm at 175÷180 adjustable strokes/min. rate.
Complete with digital timer that automatically stops the shaker at the end of the test. It cannot be sold in CE markets without security cabinet
Power supply: 230V 1ph 50 Hz 250 W
Dimensions: 700x360x350 mm. Weight: 30 Kg

CONSOLIDATION TEST

UNE-103.405/ ASTM D2435, D4546, D3877/ BS 1377/ AASHTO T216/ NF P94090-1, P94-091

The one-dimensional consolidation test of a soil sample enables to ascentain the settlement characteristic over a given period of time. The soil specimen under test a axially loaded and laterally contained. Loads are applied with progressive increases and the settlement values are read on a dial gauge or on a digital display (through a displacement transducer).
Rigidly manufactured from aluminium alloy casting to provide a high degree of accuracy with any frame distorsion under load. The load bridge group is supported in high accuracy self-aligning seat balls. The beam provides three loading ratio: 9:1 - 10:1 - 11:1 . and the beam assembly is fitted with an adjustable counterbalance weight.
Maximun load: 170 Kg of slotted weight, corresponding to 1870 Kg using the beam ratio 11:1
The equipment is supplied complete with Ø50 mm oedometer cell. With porous stones, and support for analog comparator comparators 10 x 0.01 mm.

S065 Central loading oedometer 3 posts
S066 Central loading oedometer 1 post

ACCESSORIES:
S067 Bench holding three apparatus. Made rom sturdy structural painted steel.
S068 Bench holding one apparatuses
S069 Set of 50 Kg. Of slotted weights
S070 Consolidation cells 20 cm ² for sample of 50.5 x 20 mm.
V364 Dial indicator analogic 10x0,01 mm
V360 Digital indicator 10 x 0,01 mm digital
S072 Data acquisition module 8 channel with conditioners.
S075 Software for oedometer test
S095.05 Linear vertical displacement transducer, 10 mm travel

EDOTRONIC "TOUCH SCREEN HIGH PERFORMANCE" AUTOMATIC CONSOLIDATION APPARATUS (OEDOMETER)

BS 1377:5 / ASTM D2435-80 / CEN-ISO-TS 17892-5 / XP P094-090-I

S077 This automatic consolidation system, ideal for modern and efficient laboratories, has been created to eliminate or reduce to the absolute minimum any forms of manual intervention, which the oedometer test requires. This therefore results in greater efficiency and cost effectiveness.
This appliance is extremely simple and easy to use.
Specifications of the frame:
Edotronic, equipped with two coaxial cylinders, provides a precise and timely weight positioning with two ranges of measurement:
0 – 1499 (N) Newton
1500 – 15000 (N) Newton
Input of compressed air (filtered): Max. 10 Bar
Resolution: 1 Newton
Precision: 1%
Maximum load: 15 kN (with 8 Bar input)
There is no need of weights as the cylinder and pneumatic piston take it to the desired weight in real time.
Weight application and removal are carried out automatically in the test sequences.
The load value is measured by a pressure transducer which is built in the regulation valve.
An additional high precision load cell will detect the effective load value and perform precise control through a closed loop system, granting repeatability and accuracy.

Firmware:

- Electronic control unit Cyber-plus Evolution with "Touch-Screen" color graphic display ¼ VGA, that runs like a standard PC based on Windows operating system, for the management of the data.
- The Touch-Screen icon interface allows an easy set-up of all the parameters and prompt execution of the test. Read value results are immediate and of extreme accuracy.
- The machine can perform the tests without any external PC, because of the "Cyber-Plus" grants performances like a PC.
- Direct connection to Intranet (connection to a LAN network) and Internet to establish a remote communication and receive an immediate diagnosis from Matest technicians, or for upgrades of the Firmware.
- Unlimited memory storage with: 2 USB ports, 1 SD card.
- Simple, rapid linearisation and calibration procedure.
- The appliance comes completely equipped with the relevant software.
- Possibility to select different languages.

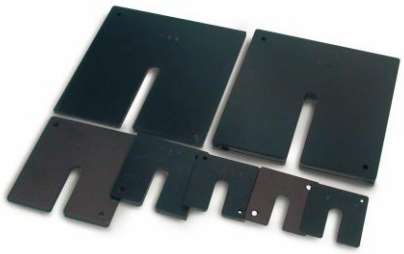
The following **"are not included"**: software oedolab connect, consolidation cell, transducer, compressor, filter, that have to be ordered separately (see accessories).
Power supply: 230V 1ph 50/60Hz
Dimensions: 290 x 450 x h 610 mm. Weight: 30 kg.

ACCESSORIES:

V244 Laboratory compressor, tank capacity 50 litres, nominal pressure 10 bar
S077.11 Air filter, auto-draining it reduces up to one micron, complete with discharge.
S077.12 Software oedolab connect
S095.05 Linear displacement-deformation transducer, accurate and versatile.
Transducer 10 mm travel
Independent linearity < 0,3%
S077.51 Calibration process of the linear displacement transducer combined with the Edotronic
Consolidation cells, different models: see pag. 142
Gauge blocks, Grad 1
Used to calibrate the linear displacement transducers.
S077.41 Gauge blok, nominal length 5 mm
S077.43 Gauge block, nominal length 10 mm.

DIRECT/RESIDUAL SHEAR TEST APPARATUS UNE-EN 103.401/ ASTM D3080/ BS 1377/ AASHTO T236/ NF P94-07-1,2

S078 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 apparatus is equipped with a control closed loop motor with epicycloid reducers. At the beginning of each test, the machine performs an automatic and complete internal check, a position reset with the elimination of all possible positioning errors and all pauses.
The input of all the 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 in stand-by, without affecting the specimen under test with quick machine setting. Possibility to fix 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.
Possibility to identify directly on the consolidation curve the effects of the primary consolidation, only with data acquisition version. Automatic calculation of the appropriate shear velocity by selecting by selecting the optimal consolidation parameter among t50, t90 and t100, improving efficiency and cost effectiveness, only with data acquisition version.



Technical features:

- Display of both speed and displacement with 0.00001 mm resolution
- Shear speed between 0.00001 to 15.0000 mm/minute
- Max shear load: 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; with lever arm: 5500N
- Box group mounted on ball track with high quality antifriction system
- Extremely easy and practical use, not requiring qualified staff.
- Power supply: 220 V, 50 Hz single phase
- Dimensions: 1350x1050x420 mm. Weight: 120 kg approx.

Shear box, hollow punch and tamper **are not included** in the standard supply and have to be ordered separately.
S082 Set of 50 Kg of slotted weight, made of painted steel (4x10 kg, 1x5 kg, 2x2 kg, 1x1 kg)

Models	Shear box	Spare couple of porous stones
Round specimens dia 50 mm	S282	S286-03 KIT
Round specimens dia 60 mm	S283	S286 KIT
Round specimens dia 100 mm	S281	S286-04 KIT
Square specimens 60x60 mm	S284	S286-01 KIT
Square specimens 100x100 mm	S285	S286-02 KIT

Models	Hollow Punch	Tamper
Dia 50 x h 25 mm	S222-08	S223-08
Dia 60 x h 25 mm	S222-09	S223-09
Dia 100 x h 25 mm	S222-10	S223-10
Aquare 60x60xh25 mm	S222-11	S223-11
Aquare 100x100xh25 mm	S222-12	S223-12

The direct/residual shear testing machine is available in "THREE" VERSIONS:
S078 Digital basic version
S084 Digital Shear Testing Machine, with incorporated Data Acquisition System and Basic Firmware, comprising:
S084.10 Shear Frame with digital "Touch-Screen" microprocessor, complete with beam loading device, shear box case with adaptors, transducers supports.
S084.20 Load Cell, electric, 3000N capacity, complete with cable.
S088 Linear vertical transducer, 10 mm travel.
S089 Linear horizontal transducer, 25 mm travel.
S090 Firmware activating 3 connectors for basic data acquisition.
S082 Set of 50 kg of slotted weights.
NOTE: Shear box, hollow punch, tamper and Software "are not included" and have to be ordered separately.
S086 Data acquisition version
S085 Digital shear Testing Machine, with incorporated Data Acquisition system and basic firmware, compresing:
S084.10 Shear Frame with digital "Touch-Screen" microprocessor, complete with beam loading device, shear box case with adaptors, transducers supports.
S084.20 Load Cell, electric, 3000N capacity, complete with cable.
S088 Linear vertical transducer, 10 mm travel.
S089 Linear horizontal transducer, 25 mm travel.
S090 Firmware activating 3 connectors for basic data acquisition.
S082 Set of 50 kg of slotted weights.
NOTE: Shear box, hollow punch, tamper and Software "are not included" and have to be ordered separately.
S335.15 Universal coupling pliers for dial gauge/transducer. It accepts all Group I&S displacement transducers and dial gauges (dia. from 8 to 20 mm).
S087 Data acquisition console 8 channel
S336.31 Extension cable 5 meters long.

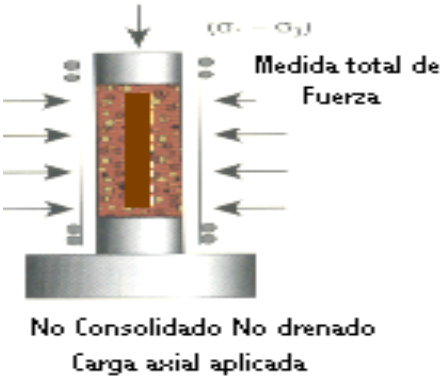
S084

S280.15 Mounting device between the universal coupling block S335.15 and the shear machine S078 to fix the vertical displacement transducer or dial gauge.
S280.16 Mounting device between the universal coupling block S335.15 and the shear machine S078 to fix the horizontal displacement transducer or dial gauge.

LAMBE TEST (INDEX POTENTIAL EXPANSION AND VOLUME CHANGE). UNE-103.600
S092 "LAMBE" apparatus. The apparatus comprises a base frame for accommodating the test cell, and with two parallel bars perpendicular to each other, linked to a loading bridge provided with upper lower device for fixing and centering ring with dynamometric millesimal comparator to perform test measurements. the machine is also equipped with a test cell with porous plate and rubber O-ring for airtight fit.
Ring Capacity: 2 KN.
Dimensions: 550x300x300 mm. Weight: 26 kg approx.
Accessories:
S013 Compaction hammer, 2.5 Kg. type Army

TRIAXIAL TEST EQUIPMENT

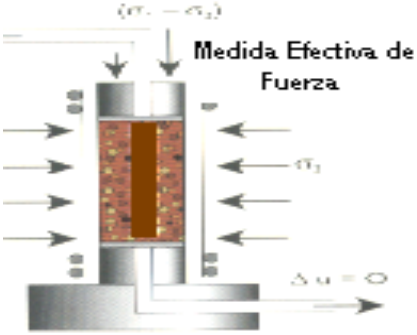
Triaxial equipment originally designed in Harvard university



No Consolidado No drenado
Carga axial aplicada

UU - Unconsolidated Undrained Test

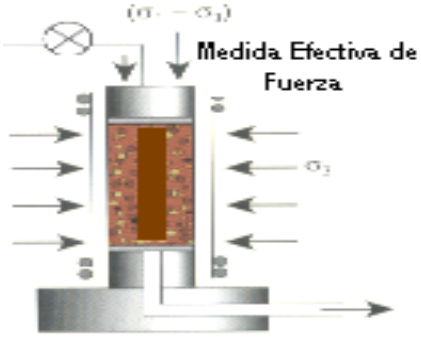
Determines the shear strength in undrained conditions. No structural variation is allowed. When pressure in the cell has been achieved, no specimen volume decrease is allowed. The same specimen is then stressed up to the failure.
This test is normally performed on three specimens taken from the same sample and subjected to three different confining pressures. 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.



Consolidado Drenado
Drenage

CU - Unconsolidated Undrained Test

Determines the characteristics of the resistance to shearing stress according to the foundations effective and verify the improvements due to compaction, pre-consolidation and stabilization. Unlike the test "UU", allowing variation of the volume of sample until the pressure is stabilized consolidation. This test is normally performed on three samples.



Consolidado No Drenado
Sin Drenage

CD - Unconsolidated Undrained Test

This test is similar to the "CU", since the shear strength can be calculated and related to the applied voltage level. It applies very permeable grounds, where they are usually geotechnical problems. This method requires a very slow, once the axial load applied is avoided increased interstitial pressure in the sample. This test is normally performed on three samples.

METHODS FOR CALCULATING THE MECHANICAL PROPERTIES OF SOIL

TRIAXIAL TEST

ASTM D2850, D4767/ NF P94-070, P94-074/ BS 1377:7, 8/ CEN-ISO TS 17892-8,9

S095 This versatile, compact, heavy duty load frame has been designed for routine tests, for central laboratories, but also for research purposes.
The frame is of rigid chromed steel twin column construction.
The electronic color digital "touch-screen" display with microprocessor control system allows to perform tests within a speed range of 0,00001 to 12 mm/min.
The maximum load capacity is 50 kN, and it is suitable either for cells S105 (max. specimen size 70x140mm) and S106 (max. specimen size 100x200mm). The system guarantees high resolutions in real time.
The load plate is foreseen of electric end of stroke, to save the machine from wrong manipulations.
Specifications of the frame:
- Maximum load capacity: 50kN
- Infinitesimal testing speed: from 0,00001 to 12 mm/min.
- Minimum vertical clearance: 400mm (140mm with ring)
- Maximum vertical clearance: 1100mm (840mm with ring)
- Horizontal clearance: 380 mm
- Platen diameter: 177 mm

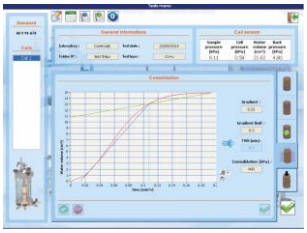
S095 with data acquisition

Firmware:
- Electronic control unit "Cyber-plus Evolution" with Touch-Screen color graphic display ¼ VGA, that runs like a standard PC based on Windows operating system for the management of the data. (Analysis of the data, test results, graphs with S085 software; optional accessory).
- The Touch-Screen icon interface allows an easy set-up of the parameters and immediate execution of the test.
- The machine can perform the tests without any external PC, because of the "Cyber-Plus" grants performances like a PC.
- Direct connection to Intranet (connection to a LAN network) and Internet to establish a remote communication and receive an immediate diagnosis and for upgrades of the Firmware.
- Unlimited memory storage with: 2 USB ports, 1 SD card.
- Possibility to select different languages.
- The machine is equipped with 8 connectors for the acquisition and data processing system up to 8 analogical/digital channels (that is activated with the S095.15 optional firmware) for load cells and transducers. Extra slot available to expand the on-board channels to 16 (with S095.16)

The frame is supplied with loading ram and sphere, but **"without"** load rings, dial gauges, electric load cells or displacement transducers that "have to be ordered separately".
Power supply: 230V 1ph 50/60Hz 600W
Dimensions: 490 x 510 xh 1800 mm
Weight: 115 kg

S095 with load ring

Accessories:
S086 Data acquisition module 16 channel
S087 Data acquisition module 8 channel
S088.01 Transducer cable connection
S085 Triaxial testing software
S095.15 Firmware for acquisition and data processing system up to 8 analogical/digital channels for load cells and transducers.
Graphic and numbers visualization, processing, printing and storing of the test results. This software activates the 8 connectors foreseen on the load frame.
S095.16 8-channel internal module, for system expansion to 16 channels of the triaxial load frame. This upgrade is possible only in I&S factory.
S095.10 Load ring 50 KN capacity



S095.10 load cell 2,5 KN capacity
S095.11 load cell 10 KN capacity
S095.12 load cell 25 KN capacity
S095.13 load cell 50 KN capacity

A196 This unit provides an infinitely variable constant pressure from o to 3500 kPa by using a motorized hydraulic pump, an oil/water interchange vessel, piston/spring, valves, and high viscosity oil.
Supplied complete with test pressure precision gauge, range 0-3500 KPa.

Power supply: 230V 1ph 50 Hz
Dimensions: 320x320x410 mm
Weight: 20 Kg

A196

S101 It provides a water pressure up to 1700 kPa.
Simple, practical and extremely accurate system used to select test pressures, it can also offer the possibility to further system expansions.
The use of deaerated water is recommended. It must be connected to a pneumatic compressor as mod. V244.
The cell set is equipped with an inlet high pressure air valve and 2 outlet valves for pressurized water and water.
Dimensions: 270x300x425 mm
Weight: 9 kg
Accessories:
S101.01 Membrane for air / water cell. Pack of 2 pieces.
S101.02 Pressure regulator, high accuracy model
S101.02 Filter unit (water trap) composed by filtering device and interchangeable cartridge, used to collect condensed water.
S101.04 Nylon tube dia 6x4 mm on 20 m roll.

V244 Laboratory air compressor, max. pressure 10 bar
Reservoir capacity: 50 liters
Power supply: 220V, 50 Hz

TRIAXIAL CELLS

Made aluminum corodal alloy and the cell can be easily assembled and disassembled by means of quick clamping rods. In order to reduce as much as possible friction, a particular care is deserved during loading ram realistion. The low cell cap is supplied with **"four inlet valves"** back pressure, low drainage, pore pressure, cell pressure. In order to measure the specimen axial deformation, an adjustable dial gauge or a displacement transducer is also provided.
NOTE: No top caps, base adaters, rubber membranes and sealing rings, prorous stones, dial gauges, etc. are included and **"should be ordered separately"** in the table all accessories for triaxial cells are listeds.

* Note: Cell S105can be also used also for specimens dia 50x100 and 38x76 mm with accessories of suitable diameter. But it is not suitable for 100x200 mm samples.
**Note: Cell S106 can be also used also for specimens dia 50x100 and 38x76 mm with accessories of suitable diameter.

Code	S105	S106
Dimensions Max. sample (dia. x h) mm	70x140	100x200
maximum pressure	1700 kPa	1700 kPa
Overal dimensions (dia. x h) mm	280x480	310x540
Weight Kg	8	16

S110 Top cap with drainage
Made of anodized aluminum, suitable for force on the specimen. Can be used for both trials as drained and undrained.

S110.05 Top head undrained
Made of anodized aluminum, suitable for use drained tests.

S111 Base Adapters for cell
Anodized aluminum manufactured to adapt the cell to the size of the specimen. It has hole for drainage and pore pressure.

S113 Porous disc
Manufactured quartz conglomerate. Assays used drained and placed on the sample.
Thickness: 10 mm.

Triaxial cell Accessories	Ø38x76 mm	Ø50x100 mm	Ø70x140 mm	Ø100x200 mm
Top cap	S110.01	S110.02	S110.03	S110.04
Adapters base	S111.01	S111.02	S111.03	S111.04
Base disc	S112.01	S112.02	S112.03	S112.04
Porous disc (2)	S113.01	S113.02	S113.03	S113.04
Membrane (Pack 10)	S114.01	S114.02	S114.03	S114.04
O-ring (pack of 10)	S115.01	S115.02	S115.03	S115.04
Tensor membrane	S116.01	S116.02	S116.03	S116.04
Tool placement of O-ring	S117.01	S117.02	S117.03	S117.04
Tripartite moulde	S118.01	S118.02	S118.03	S118.04
Bipartite moulde	S119.01	S119.02	S119.03	S119.04
Drain filter paper (50)	S120.01	S120.02	S120.03	S120.04
Filter paper (100)	S121.01	S121.02	S121.03	S121.04

S114 Rubber membrane
It serves to cover the specimen to isolate lateral pressure.
Supplied in packs of 10.

S118 Tripartite mould, made of steel in three parts for ease of stripping. Is used to prepare specimens and compact.

S122 Core cutter Ø38,1 mm samples, made of tubular stainless steel cutting edge and a wooden cylinder to draw the sample.

PROCTOR TEST: MOISTURE-DENSITY RELATIONSHIP
DETERMINING THE RELATIONSHIP BETWEEN DRY DENSITY, MOISTURE CONTENT AND COMPACTION

EN 13286-2, 103.501/ ASTM D558, D698, D1557/ AASHTO T134, T180/ BS 1377:4, 1924:2/ NF P94-093, P94-066

S125 Standard P.N. Mould. Made of tubular steel and hinged open by generatrix, with corrosion protection. Supplied complete with base and collar.
Dimensions: Ø 102 ± 0.4 mm int. X 122.4 ± 0.1 mm.

S126 Standard P.N. Mould. Made of closed steel tube with corrosion protection. Supplied complete with base and collar.
Dimensions: Ø 102 ± 0.4 mm int. X 122.4 ± 0.1 mm.

Accessories:
S128 Straight edge with handle

DETERMINE THE RELATIONSHIP BETWEEN THE DENSITY OF DRY SOIL COMPACTED WITH DIFFERENT MOISTURE CONTENTS.
MODIFIED PROCTOR TEST EQUIPMENT

S129 Standard P.M.Mould. Made of tubular steel and hinged open by generatrix, with corrosion protection.
Dimensions: 152.5 ± 0.7 mm Ø int. X 127 ± 0.1 mm in height.
S129.01 Base without hole for mold proctor modified.
S129.02 Collar for Modified proctor mould.
S128 Straight edge with handle

CALIFORNIAN BEARING RATIO - CBR
GRADE DETERMINATION LOAD RESISTANCE OF SOILS AS FLEXIBLE PAVEMENT
EN 13286-47, EN 13286-4/ UNE 103.502/ ASTM D1883/ AASHTO T193/ BS 1377:4, 1924:2/ NF P94-078, P94-093, P98-231

S130 C.B.R. mould made of tubular steel and hinged open by generatrix, with corrosion protection. Dimensions: dia. 152.5 ± 0.3 mm int. X 177.8 ± 0.1 mm in height.
S130.01 Perforated base plate for C.B.R.
S129.02 Collar for mould C.B.R.
S131 Spacer disc with "T" handle dia. 151 ± 0.3 and 50.8 ± 0.1 mm thick.
S132 Perforated (Sweel) plate
S133 Tripod (dial gauge support)
V364 Dial gauge 10 mm range 0,01 mm subd.
S134 Slotted surcharge weight 10 Ib.
S135 Slotted surcharge weight 5 Ib.
S136 Annular surcharge weight 10 Ib.
S137 Annular surcharge weight 10 Ib
S138 Filter paper dia. 150 mm (pack of 100)
S128 Straight edge 300x30x3 mm.
S139 CBR penetration piston

S140 Compaction rammer type "Army" of 4.535 ± 0.01 kg . Made of steel with corrosion protection.
S140.01 Rammer dia. mm 50 ± 0,5. Fall height mm 457 ± 3.Rammer weight Kg 4,5 ± 0,04. Total weight kg 8

S141 Compaction rammer type Army of 2.5 kg dia. 50, 8mm. Made of steel with corrosion protection.
S141.01 Rammer dia. mm 50,8. Fall height mm 304,08 Rammer weight Kg 2,495. Total weight kg 6.

HARVARD TEST
S142 Harvard bipartite mold for soils with particles smaller than 5 mm., Made of steel with anti-corrosion treatment. Supplied whit base and collar
Dimensions: 33.3 x 71.5 mmh interior.
S143 Harvard rammer
S144 Support Harvard

PROCTOR/CBR UNIVERSAL COMPACTOR
EN 13286-2/ ASTM D698, D1557, D1883/ NF P94-093, P94-066/ AASHTO T99, T180, T193/ BS 1377

S146 Universal electromagnetic compactor Fully automatic regulation of rotation for adjustment to the various tests you can perform. Designed for compaction testing samples: Normal Proctor, Modified Proctor, CBR, soil cement and gravel-cement, as standard. Equipped with control panel on which are located the developer of the number of strokes with automatic stop, counter tiers, both electronic type with digital display, switch-off, pilot lights, stop and emergency protective screen area drive hub. Manufactured in steel frame and ready to host the Marshall test pedestal (not included). The machine is supplied complete with bases to Proctor, CBR, bar and game two clubs (feet) hardened. No accessories included trials NLT-159 (Marshall)
Power: 220 V - 380 V three-phase, 50 Hz
Speed: 40 strokes per minute
Dimensions: 680 x 650 x 1570 mm high.

Accessories:
B022.05 Accessories NTL-159 test, formed a pedestal by wood and steel base plate for mold clamping device.
B022.02 Tube or hammer for the Marshall test
B022.03 Special hardened steel hammer stand for Marshall
S146.01 Tube or hammer for CBR, Standard Proctor and Modified Proctor tests
S146.02 Safety protection test area

VIBRATING COMPACTION HAMMER
EN 13286-4/ BS 1377:4, 1924:2, 1924 :2/ UNE EN 12697-32

S147 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 asphalt in the percentage refusal density.
Supplied without tampers and support frame which must be ordered separately.
Power supply: 230 V 1ph 50/60 Hz 750 W
Dimensions: 105x430x270 mm
Weight: 7 kg

Accessories:
S147.01 Tool carrier
S147.02 CBR and proctor tamping foot, 146 mm dia., complete with shank
S148 Supporting frame for vibrating hammer.
The sliding mass has a total weight (including hammer and tamping foot) of 37 kg
as requested by EN Spec.
Steel made, plated against corrosion.
Weight: 70 kg

Automatic, programmable PROCTOR / CBR Compactor with microprocessor, "high technology"

EN 13286-47 / CNR UNI 10009 / CNR N. 29, 69 / ASTM D698, D1557, D1883 / AASHTO T99, T180, T193 BS 1377:4, 1990, 1994 / NF P94-093, P94-066 / DIN 18127 / UNE 7365, 7255, 103-501-94 / DUTCH RAW y la mayoría de la Normas Internacionales.

S149 Designed to compact Proctor and CBR specimens, it ensures an extremely uniform compaction degree, granting reliable and repeatable test results.

The microprocessor software allows to select and to perform different compaction cycles in a fully automatic system, by strictly meeting the mentioned International Standards.

The blows are automatically distributed as requested by the selected Standard, with turntable rotation and rammer displacement through photoelectric cell sensors and microprocessor. Top quality components and high accuracy mechanical workings grant very long life also under intensive utilizations.

The digital control panel is separate from the machine and it can be fixed to the wall or mounted on a bench. The high resolution graphic display (blue negative) 320x240 pixels visualizes selected Standard, total number of blows, effected and remaining ones to end the test, and execution of each layer.

The compactor is easy to use, friendly menu driven, of simple and practical maintenance.

The user can **"select and memorize up to 10 personalized test cycles"**, that can be later on modified or replaced by other ones. This is a very important function, because it allows updating the Compactor to new Standards, or any Standard not included in the microprocessor, or for research purposes.

The original lift system of the rammer can be selected at 12" or 18", or at 300 or 450 mm, granting a correct and constant fall height.

Rammer drop speed: 1 blow each 2 seconds.

The compactor accepts moulds having dia. 4" and 6", 100 and 150 mm, both Group I&S made or from other producers, thanks to its universal mould fixing system.

The machine is supplied **"without rammers"** to be ordered separately and selected according to the desired Standard (rammers are interchangeable).

Not sellable in CE markets

Power supply: 230V 1ph 50Hz 500W

Dimensions: 610x470xh1710 mm

Weight: 165 Kg

NEDDED ACCESSORIES :

S149.06 Standard rammer 50 ±0,2 mm dia. and 2500 ±10 g weight

S149.07 Modified rammer 50 ±0,2 mm dia. and 4535 ±5 g weight. Conforming to: EN 13286-47 / BS 1377:4 UNE 7255, 7365, 103-501 / DIN 18127

S149.08 Standard rammer 50,8 ± 0,13 mm dia. and 2491,25 +/- 1,25 g weight

S149.09 Modified rammer 50,8 ± 0,13 mm dia. and 4537 ±3 g weight. Conforming to: ASTM D558. D559, D698, D1557, D1883 NF P94-066/93 / CNR UNI 10009 CNR N. 69 / AASHTO T99, T180, T193

S149.13 Standard rammer, 50 ± 0,4 mm dia. and 2700 ± 10 g weight.

S149.14 Standard rammer, 50 ± 0,4 mm dia. and 4900 ± 10 g weight. Conforming tos: AS 1289 (Australian) Standard

ACCESSORIES:

S149.11 Safety guards to CE Directive. If the door is opened when the Compactor is working, it stops automatically.

S149.12 Soundproof security CABINET, steel made with microswitch, complying to CE Safety Directive, lined with sound-proofing material for noise reduction. If the door is opened while the Compactor is working, it automatically stops.

Dimensions: 740x730x1900 mm

Weight: 80 kg approx.

APARE PARTS:

S149.22 Calibrated rod holding the rammer.

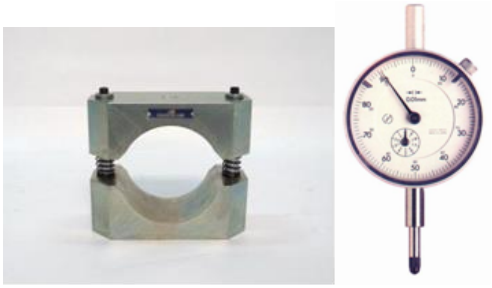
S149.23 Kit of devices fixing the mould to the table

UNIVERSAL CBR/MARSHALL 2 SPEEDS FRAME 50 KN

The frame is provided of two fix speed ranges, easily selectable by a frequency changer (inverter) activated by an electric switch:
1,27 mm/min for CBR tests
50,8 mm/min for Marshall tests
The load is measured by an electric 50 KN cell with high precision strain transducers. the deformation (flow) is measured by a displacement transducer 50 mm stroke and ±0,1% indendent linearity.
Display system , measures and displays at the same time the load (stability) in KN and the deformation (flow) in mm with pick hold features and possibility to print certificates and graphics directly on a laser printer via USB or to transfer them to PC via Ethernet.
Supplied complete with control system "Cyber-Plus 8 Evolution" , load cell and displacement transducer, but "without" accessoroies and Software for CBR and Marshall tests, to be ordered separately.
Power supply: 230V I ph 50/60 Hz 750 W
Dimensions: 450x400x1200 mm
Weight: 130 Kg

Accessories:

S150.03 Metal structure for the machine placement
S139 Penetration piston CBR test
B036 Loaad piston Marshall test
S150.08 Upper + lower compression plates, 100 mm dia + distance piece with rod
S150.09 Software UTM2 (Universal Testing Machine 2) Licence for **CBR** test. Standards: EN 12697-34 / ASTM D1559 / BS 598:107 / NF P98-251
S150.10 Software UTM2 (Universal Testing Machine 2) Licence for **MARSHALL** test. Standards: EN 13286-47 / ASTM D1883 / BS 1377 / NF P94-078



B035 Marshall stability mould
V364 Analog gauge 10 x 0.01 mm

V370 Magnetic base with articulated and adjustable arm for gauge holding

CBR TESTING MACHINES

STANDARDS: EN 13286-47 / ASTM D1883 / BS 1377:4 / AASHTO T193 / NF P94-078

Used to load the penetration piston into the soil sample at a constant rate of 1,27 mm/min, and to mesasure the applied and piston´s penetrations at determined intervals.

Group I&S 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 grapihic recorder of load/penetration through RS 232 port to PC.

CBR loading machine, hand operated, laboratory model

S152 Load is applied through a meckanical jack and handwheel. Upper beam can be adjusted in height.
Foreseen of fast approach device of the base plate.
The CBR machine comprises:
S152-01 CBR laboratory frame
S139 CBR penetration piston
S153.11 Load ring 50 kN capacity
V364 Dial gauge 10 x 0,01 mm
V364.03 Dial gauge holder
Dimensions: 430x380x1180 mm
Weight: 80 Kg

CBR loading machine motorized, 50 kN ASTM version - 1,27 mm/min

S153 Load is applied through a screw jack driven by an electric motor at a costant penetration rate of 1,27 mm/min achieved by a built in gear box and **"assured also under load".**
Upper beam an 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 CBR machine comprises:
S153.10 CBR motorized frame
S139CBR penetration piston
S153.11 Load ring 50 kN capacity
V364 Dial gauge 10 x 0,01 mm
S364.03 Dial gauge holder
Power supply: 230 V 1ph 50 Hz 750 W
Dimensions: 430x380x1180 mm
Weight: 98 Kg

ACCESSORIES:

S210-02 Used to apply the correct rate of 1,27 mm/min penetration.
Power supply: 220-240 V 1ph 50 Hz

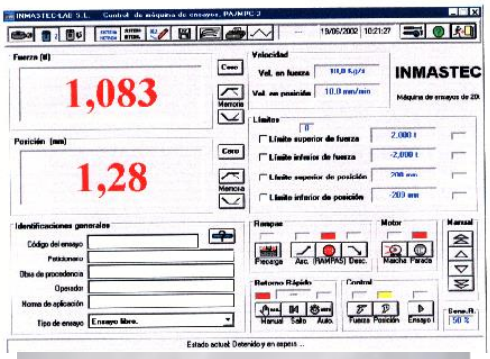
S364.01 Brake device, it holds the max. applied load on the dial gauge of the ring, with manual zero setting.
Suitable for S152 and S153 machines.

S364.02 Electric device for automatic stop of the CBR machine when reaching the max. capacity load.
To prevent any overload damage this device is mounted on the proving ring of the S153 machine.

UNIVERSAL MACHINES (MULTIPURPOSE) ELECTROMECHANICAL FLEXURAL, COMPRESSION AND TEMSILE TEST
EN 13286-47, EN 196-1/ UNE 103.502, 67100-85/ ASTM D1833/ AASHTO T193/ BS 13772:4/ NF P94-078
Electromechanical multitest load, automatic compact to 200 or 300 KN capacity for compression-deflection tests mortar specimens CBR and Marshall tests, compression tests on flexural materials and vials, with load cell, microprocessor console managed by latest computer. Actuating speed is adjustable between 0.1 mm. / Min and 100 mm. / Minute and 0.1 Kg. / Sec. and 1000 Kg. / sec. The machine has an on-off switch, limit switch and emergency stop button.
Supplied complete with microprocessor management module, computer and manual (grips for tensile trial not included).
• External dimensions: 2200 x 1200 x 500 mm.
• Distance between plates: 700 mm.
• Distance between columns: 620 mm.
• Piston stroke: 0-400 mm.
• Maximum force: 200 to 300 KN.
• Resolution of force: 1 N
• Displacement resolution: 0.01 mm.
• Magnetothermal switch
• Power indicator light.
• Frame Weight: ≈ 900 kg approx.
Power supply: 220V AC, single phase over ground

S155 Universal machine capacity of 200 KN
S156 Universal machine capacity of 300 KN

Accessories:
S155.05 ENAC certificate calibration with issuance "in situ" for machines (budget request).
S155.01 Load cell 50 KN capacity on machines for coupling with corresponding couplings.
E015 Set manuals holder jaws. This equipment is designed to be used with the multiensayos presses depending on the capacity of each machine.
Supplied with two sets of pliers, one flat and one round for V.
Forceps flat: for flat specimens of 0 to 10 mm thick
Round tongs: 0 to 7 mm in diameter.
Tweezers in V: for round specimens from dia 8 to 14 mm.
Note: The machine does not include flexural device, which must be ordered separately



UNIVERSAL MACHINE (MULTIPURPOSE) TESTING A FLEXURAL, COMPRESSION AND TRACTION OF FOUR COLUMANAS.

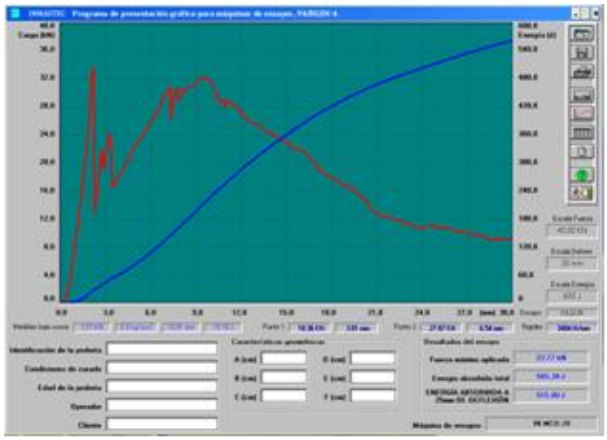
S157 Electromechanical multitest machine 400 KN capacity, compact automatic for flexural-compression tests and test specimens of mortar Marshall CBR, compression tests and construction materials Vials with cell load of 500 KN. capacity with managed controlled console by microprocessor and computer latest generation. Actuating speed is adjustable between 0.1 mm. / Min and 100 mm. / Minute and 0.1 Kg. / Sec. and 1000 Kg. / sec. The machine has an on-off switch, limit switch and emergency stop button.
Supplied complete with microprocessor management console, computer and manual (jaws for tensile testing not included) and load cell of 500 kN with a corresponding coupling.

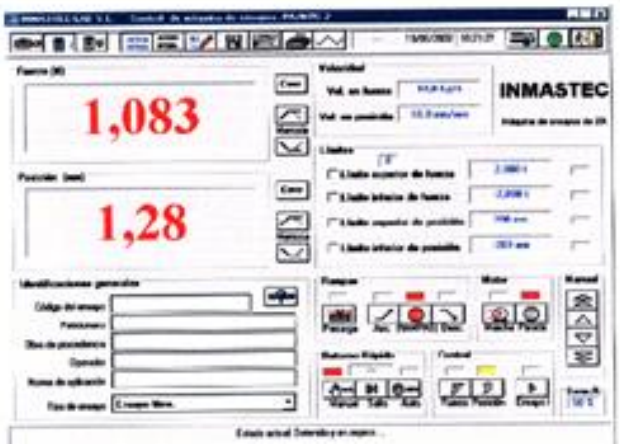
Tecnical Feature:

- External dimensions: 2200 x 1200 x 600 mm.
- Distance between plates: 600 mm.
- Distance between columns: 420 mm.
- Piston stroke: 0-400 mm.
- Maximum force: 400 KN.
- Resolution of force: 1 N
- Displacement resolution: 0.01 mm.
- Magnetothermal switch.
- Power indicator light.
- Frame Weight: ≈ 1200 kg approx.

Power supply: 220V AC, single phase more grounded.

S157.05 Certificate ENAC calibration with issuance "in situ" Machine 400 KN





UNIVERSAL TESTING MACHINE

S160 Electromechanical machine double piston

Automatic testing machine and servo twin screw latter governed by computer generation, comprising a rigid structure with loading bridge motherboard movable bridge guided by two columns of chrome steel. Serv-electromechanical drive engine by two ball screws and re-circulating provide outstanding smoothness of operation and a constant speed during the test.

Rigid inner bridge high resistance load houses the assembly formed by the screw, the electromechanical group and press control module.

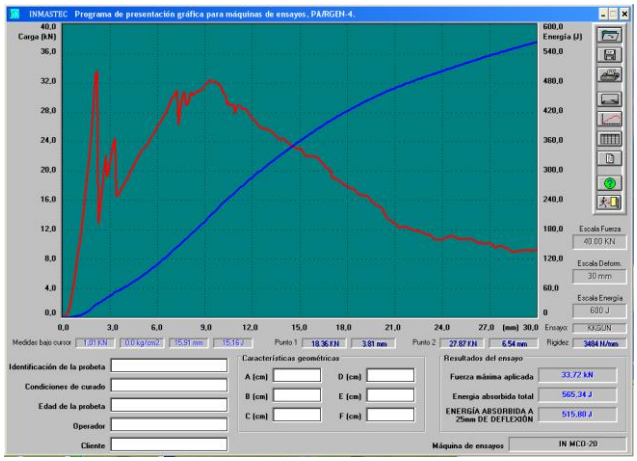
Load cell (tension-compression) mounted on the upper bridge, which the control module transmits the force exerted at each test point. The regulation of the travel speed and the loading speed of the spindle is processed by the electronic module.

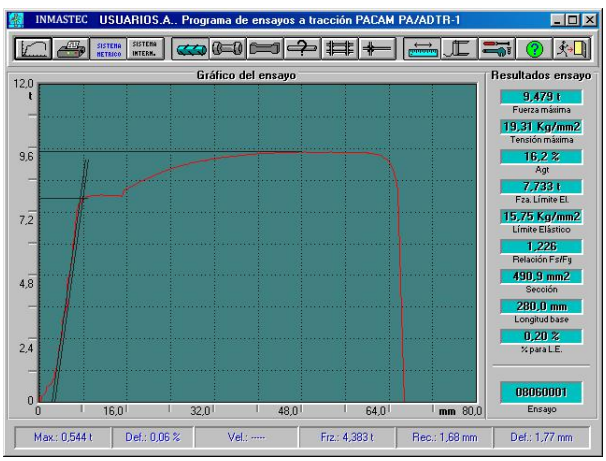
The compression plates are hardened and ground, the bottom of Ø 220 mm. is marked concentric, very helpful for correct positioning of the jaw Marshall, among other applications. The system includes an upper ball joint that allows perfect fitting.

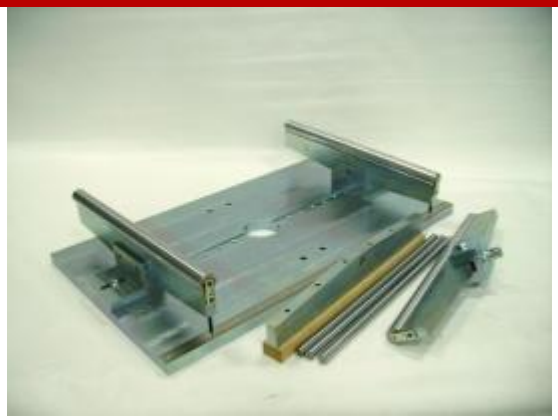
TECHNICAL FEATURES:

Capacity: 300 KN.
Resolution of force: 1 N
Displacement resolution: 0.01 mm.
Useful light horizontal: 620 mm
Sandy Bridge mobile standard: ± 1500mm.
Stiffness test frame (combined) exceeding 1 mm. / 300KN.
Power supply: 220V AC, single phase more grounded.
Power: 1500 W
Weight: 700 kg approx.
The machine is supplied complete with load cell of 300 kN.
General Testing Software, last generation computer flat screen and user manual in inglish.
This machine has the possibility of coupling a variety of devices for both compression tests, flexural tests as for traction. (See accessories).

S162 Electromechanical machine double screw model similar to S160, but of 200 KN







S166 Flexural testing device. Equipment that can be attached to a multitester machine That allows testing transverse curbs and tiles, flat blocks, tiles flexural, etc..
Weight: 210kg.

S160.04 Screen protection for area and perimeter security test support multitester machine.

UNIVERSAL TESTING MACHINE

S164 Electromechanical machine servo automatic double piston, ruled last generation computer model similar to S160, but with flexural device for curbs and tiles, flat blocks, roof tiles bending, etc..

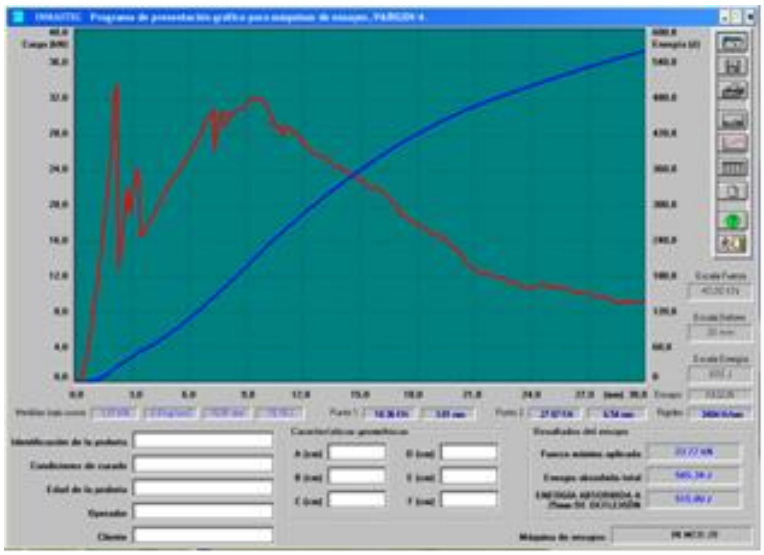


PLATE BEARING TEST EQUIPMENT
UNE 103.308 / NLT-357/98 / UNE 7391 / ASTM D1194, D1195, D1196 / BS 1377-9

Plate bearing test equipment 200 KN capacity

This test is performed for the determination of the bearing capacity of a soil in-situ on load constructions, foundations, road subgrades, airport and highway pavements.

Wide ranges of plate bearing test equipment are avaible, together with many accessories acording to the diferent Standards and specific enduser needs.

S170 Hydraulic jack 200 KN capacity, complete with hand pump, rubber pipe with fast connector, set of extension rods of diferent lengths and carrying case.. The device consists of the following elements:

- load plate 300 mm dia, surface plate 700 mm2.
- Pressure gauge 0-200 KN div. 1 KN.
- Upper spherical seat.
- Intermediate plate 160 mm dia

S170.03 Datum bar assembly 2,5 m long. Telescopic, aluminium made, adjustable in height, complete with base supports, plumb and spirit level. Packed separayely. (Alternative solutions S170.03 “Y” measuring system, Swiss method)

- 3 dial gauge 25x0,01 mm
- 3 articulated dial gauge supports with adjustment device.

Weight: 70 Kg approx..

ACCESSORIES:

S171 Load cell capacity of 200 KN and engageable in the module plate with display and buttons of force membrane (TM or KN) pressure (Kg / cm ² or mPa) and button size of the plates 300, 600 and 762 mm. has reset button. Direct reading and rechargeable

S172 Module 4 channel control with display and membrane buttons for strength (TM or KN), pressure (Kg / cm ² or MPa) and deformation to the plates 300, 600 and 762 mm. has reset button, memory, rechargeable battery and direct reading

S170.01 Bearing plate 600 mm dia. Standard NF P94-117-1

S173 Bearing plate 762 mm dia. for load plate with handles

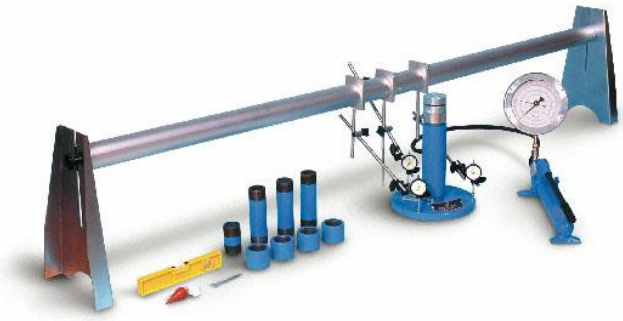
S174 Square plate 300 mm. according to UNE 7391

V361 Digital Comparator 0-30 mm capacity and resolution 0.01 mm.

V360 Digital Comparator 0 to 12.5 mm capacity and resolution 0.01 mm. with data output

S175 Potentiometric sensor tip 25 mm and spring

S170.05 Officially certified calibration ENAC for the load cell load plate.



SAND DENSITY CONE APPARATUS
UNE 103-503/ ASTM D1556/ AASHTO T191/ NF P94-061-3

S180 Metal double cone assembly with calve, Ø 6" (152 mm),
S181 Metal base with fixed centre hole for cone housing
S182 Plastic bottle 5 l.
S183 Calibrated sand for density test (25 Kg sack)

Tools for "in situ" density tests

V300 Rubber mallet
V301 Density chisel 300 mm long
V302 Density pick, small sized
V303 Ladle, stainless steel
V304 Rubber bucket, 15 litres
V305 Rubber bucket, 22 litres
V306 Wooden handled pot
V307 Small round stainless steel
V308 Médium round stainless steel
V309 Large round stainless steel
V310 Trowel

PERMEAMETER STAND 4 CELLS CAPACITY FOR CONSTANT AND FALLING HEAD TESTS

S185 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 for constant head tests.
Supplied complete with tubes, graduated rules, piping, connectors and cocks; but without permeameters mould to be ordered separately.
The stand can hold up to 4 permeameters having dia. 4" and 6" to perform different types of tests at the same time.
Dimensions: 1050x900x2000/3850 mm
Weight: 75 Kg

Accessories:

S186 Compaction permeameter 4" dia. The permeameter body is the same of a Proctor Standard mould. Weight: 8 Kg
S186. Plein base and collar for compaction tests.
S186.02 Mould body with two lateral water inlet/outlet

S187 The permeameter body is the same of a CBR or Proctor Modified mould. Weight: 16 Kg
S187.01 Plein base and collar for compaction tests.
S187.02 Mould body with two lateral water inlet/outlet
S186.03 Piedras porosas de Ø 100 mm.
S187.03 Piedras porosas de Ø 150 mm.

BALLOON DENSITY METHOD
NF P94-061-2/ ASTM D2167

S190 Used to determine the in-situ density of fine graded compacted or bonded soil, this unit has the same test system of mod.S191,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 and accessories.
Dimensions:360x360x700 mm
Weight:10 Kg
S193 Identical to Mod. S190, but with capacity of 6 litres.
Weight: 18 Kg
Accessories:
S190.03 Reinforced rubber membrane, pack of 6

Balloon Density apparatus 1600 ml capacity

S191 Used to determine the in-sity 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 ballon 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
Accessories:
S191.03 Rubber ballons, pack of 12

Pinhole test equipment

S192 Utilized to evaluate the erosion on soil samples having high degree of sodium content, the Pinhole apparatus reproduces the water flowing in a cavity obtained from a soil specimen.
The apparatus consists of a cylindrical container equipped at its ends of water inlet/outlet connectors, tube with graduated scale, base support with rod.
Weight: 4 kg approx.

Accesorios:
S192.04 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.
S192.06 Tubing, inside dia. 8 mm, 5 m long.

D016 Baroid mud balance
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

Sand Content of Drilling Muds
D018 The Sand Content Kit is a simple, accurate and inexpensive sieve analysis apparatus for determining the sand content of drilling muds.
The kit consists of a special 200-mesh sieve 2,5" in diameter, faste-ned inside a collar upon which a small funnel is fitted on either end.
This is used with a 10ml glass measuring tube, graduated to read from 0 to 20% the percentage sand by volume.
The collar and funnel are made of polyethylene and the screen is made of brass. A 500ml wash bottle and carrying case are included.
Weight: 1500 g

B117 Marsh cone to determine the viscosity of sludge. Manufactured of durable plastic mesh of 2 mm light on top and outlet orifice of 4.7 mm, Supplied complete with 1 liter container.
Dimensions: Ø160 x 370 mm
Weight: 1 Kg approx..

S036 Geopocket dial penetrometer, designed for a quick determination of the foundation soil, form f clay to sandy soils.
It indicates the angle of internal friction (sandy soils) and cohesion (clay soils) and the appro. Unconfined compressive strength.
Peak hold feature; zero setting by push button.
Supplieds complete with 5 plungers Ø 6,4 - 10 - 15 - 20 - 25 mm. Weight 400 gr.

S042 Geopocket dial penetrometer, designed for a quick determination of the foundation soil, form f clay to sandy soils.
It indicates the angle of internal friction (sandy soils) and cohesion (clay soils) and the appro. Unconfined compressive strength.
Peak hold feature; zero setting by push button.
Supplieds complete with 5 plungers Ø 6,4 - 10 - 15 - 20 - 25 mm.
Weight 400 gr.
C143 Pocket penetrometer, identical to mod. S042 but having a range of 0-16 Kg/cm². suitable for very compacted soils. Weight: 800 g.

S042

Torvane shear tester
S194 Designed to quickly determine shear strength of cohesive terrain. It can be used both in the laboratory and in the field, with winch is supplied standard 25 mm in diameter, range 0-10 N / cm ², windlass adapter sensitive scale 0-2 N / cm ² and windlass adapter 0-25 scale high-capacity N / cm ²molinete de gran capacidad escala 0-25 N/cm²

General material

GRUPO I&S

GRUPO I&S

Immersion thermostat
GENERAL FEATURES
- Resolution: 0.1 ° C.
- Accuracy: ± 0.5 fs (full scale)
- Temperature display: 4-digit display
- Probe type: up to 99.9 ° C PTC probe, up to 250 º C PT-100 type.
- Resistance armored in stainless steel AISI 316
- Agitation pump, capable of homogenizing vessel temperature to 100 liter capacity (relative to water and the covered container).
- Temperature control with digital thermostat.
- All parts in contact with the liquid are made of stainless steel AISI 304.
- Manufactured according to EC guidelines.
- Dimensions: Depth 150 mm.

Tared basins Double body, stainless steel interior, 18/10 AISI 304 stainless steel outer

IMMERSION THERMOSTAT

Code	Type	Temp. max. (ºC)	precision(end scale)	Resolution (ºC)	Type of probe	Power (W)
V001	TFB	99,9	0,5%	0,1	PTC	1000
V002	TFB	99,9	0,5%	0,1	PTC	2000
V003	TFB	250	0,5%	0,1	Pt100	2000

ACCESSORIES

Code	Article	Capacity (l)	Internal dimensions W x H x D (mm)	Exterior dimensions W x H x D (mm)
V010	Tared cuvettes	9	290 x 150 x 220	380 x 180 x 290
V011	Tared cuvettes	12	320 x 150 x 290	380 x 180 x 350
V012	Tared cuvettes	20	480 x 150 x 290	550 x 180 x 350
V013	Tared cuvettes	27	480 x 200 x 290	550 x 230 x 350
V014	Tared cuvettes	50	600 x 200 x 480	670 x 230 x 550
V015	Methacrylate cuvettes	10	165 x 150 x 400	173 x 158 x 408
V016	Methacrylate cuvettes	13	230 x 150 x 400	238 x 158 x 408
V017	Methacrylate cuvettes	30	300 x 200 x 500	308 x 208 x 508
V020	Drain cock for attachment to metal cuvettes			
V021	Output valve tap for external circulation pump coupled to the stirrer to			
V022	Large cuvettes adapter to the thermostat			

*Request we can manufacture cuvettes of up to 100 liters

Thermostatic bath with digital display, adjustable for temperatures from ambient +5 ° C to 99.9 ° C and 200 ° C. Resolution 0.1 ° and 1 ° C.

GENERAL FEATURES

Regulación y lectura digital de la temperatura mediante microprocesador con acción P.I.D. y sonda de temperatura PT100. Tiempo de espera de puesta en marcha programable (0-99,5 h) Tiempo de mantenimiento de temperatura programable (0-99,5 h). Seguridad según norma: EN 61010-1 Termostato de seguridad con rearme manual que desconecta el equipo cuando se activa, conforme DIN 12877 Clase 2. Cubeta interior estampada y mueble exterior en acero inoxidable AISI 304 Resistencia eléctrica en acero inoxidable en el interior de la cubeta Grifo de desagüe incorporado Incluye la bandeja cubre resistencia perforada

Code	Capacity	Type	Temp.máx. ºC	Internal dimensions W x H x D (mm)	Exterior dimensions W x H x D (mm)	Power	Precision(º C)
V025	5	Digital	99,9	295 x 150 x 140	340 x 210 x 280	600	0,1
V026	5	Digital	200	295 x 150 x 140	340 x 210 x 280	1.000	1
V027	12	Digital	99,9	320 x 150 x 295	340 x 210 x 450	1.200	0,1
V028	12	Digital	200	320 x 150 x 295	340 x 210 x 450	1.500	1
V029	20	Digital	99,9	490 x 150 x 290	630 x 210 x 340	1.600	0,1
V030	20	Digital	200	490 x 150 x 290	630 x 210 x 340	2.000	1
V031	40	Digital	99,9	620 x 150 x 500	660 x 210 x 630	2.400	0,1
V032	40	Digital	200	620 x 150 x 500	660 x 210 x 630	3.200	1




Code	Accessories
V035	Stainless steel lid with 2 holes and disc adapters for 5 liter bath.
V036	Stainless steel lid with 4 holes and disc adapters for 12 liter bath.
V037	Stainless steel lid with 6 holes and disc adapters for 20 liter bath.
V038	Sloping lid, for 5 L baths.
V039	Sloping lid, for 12 L baths.
V040	Sloping lid, for 20 L baths.
V041	Resistance-cover tray to 5 liters bath.
V042	Resistance-cover tray to 12 liters bath.
V043	Resistance-cover tray to 20 liters bath..
V044	Blanking lid for 5 liter bath .
V045	Blanking lid for 12 liter bath
V046	Blanking lid for 20 liter bath

Thermostatic baths with electronic adjustable temperatures, from ambient to up to 200 º C

GENERAL FEATURES

- Double wall, metal construction: exterior painted in epoxy with anti-oxidant treatment and interior basin made of 18/10 stainless steel.
- Heating by shielded heating element made of AISI 316 stainless steel.
- Equipped with a safety thermostat that has a manual reset in the event of over-temperature according to DIN 12877, class 2.
- Control panel includes:
- Illuminated ON switch
- Indicator light showing heating element operation.
- Safety thermostat indicator light.
- Temperature control.
- Manufactured according to CE directives.
- Power supply: 230V/50Hz

Specific characteristics:
ANALOGUE BATHS:

- Temperature control bulb thermostat, from ambient temperature up to 120º C or 200º C, depending on different versions.

Code	Capacity (litros)	Type	Temperature maxim	Internal dimensions W x H x D (mm)	Weight (Kg.)	Exterior dimensions W x H x D (mm)	Power (w)	Precision
V052	5	Analog.	120	290x150x140	4	370x200x280	700	±1º
V053	5	Analog.	200	290x150x140	4	370x200x280	1000	±2º
V054	12	Analog.	120	320x150x290	6	390x200x440	1200	±1º
V055	12	Analog.	200	320x150x290	6	390x200x440	1500	±2º
V056	20	Analog.	120	490x150x290	8	560x200x440	1700	±1º
V057	20	Analog.	200	490x150x290	8	560x200x440	2000	±2º

Automatic water distiller

V060 Water distiller with borosilicate glass, for desktop or wall mounted. Mounted on metal cabinet, stove enamelled with epoxy resin. Electrical resistance screw top for easy rapid change. Automatic device which switches the resistor in case of failure in the cooling water supply, turning to automatically connect to the water supply is restored.
Capacity 3 l / hour consumption 3000 W, weight 5 kg

Thermostatic baths with digital temperature control, adjustable temperatures from ambient to up to 200 º C

TECHNICAL FEATURES

- Double wall, metal construction: exterior painted in epoxy with anti-oxidant treatment and interior basin made of 18/10 stainless steel.
- Heating by shielded heating element made of AISI 316 stainless steel.
- Equipped with a safety thermostat that has a manual reset in the event of over-temperature according to DIN 12877, class 2.
- Control panel includes:
- Illuminated ON switch
- Indicator light showing heating element operation.
- Safety thermostat indicator light.
- Temperature control.
- Manufactured according to CE directives.
- Voltage: 230V/50Hz

Specific characteristics:

DIGITAL BATHS:

- Digital Temperature control or analogue models by digital thermostat
- Temperature precision: 0,1º

Code	Capacity (litros)	Type	Temperature maxim	Internal dimensions W x H x D (mm)	Weight (Kg.)	Exterior dimensions W x H x D (mm)	Powr (w)	Probe	Precision
V061	5	Digital	100	290x150x140	4	370x200x280	500	PTC	+/- 0,5% fs
V062	5	Digital	200	290x150x140	4	370x200x280	700	Pt100	+/- 0,5% fs
V063	12	Digital	100	320x150x290	6	390x200x440	1200	PTC	+/- 0,5% fs
V064	12	Digital	200	320x150x290	6	390x200x440	1500	Pt100	+/- 0,5% fs
V065	20	Digital	100	490x150x290	8	560x200x440	1700	PTC	+/- 0,5% fs
V066	20	Digital	200	490x150x290	8	560x200x440	2000	Pt100	+/- 0,5% fs

PLACAS CALEFACTORAS ANALOGICAS

FEATURES

Temperature on the surface up to 400° C. with heating power selector Enamel external case, temperature and corrosion resistant, with heating power selector. Sturdy steel hotplate with built in electric heater.

Code	Temperature control	Internal Dimensions (mm) D x W	Ext. Dimensions (mm) H x W x D	Temperature maxim(ºC)	Power(W)
V070	Electronics	200 x 390	120 x 220 x 550	400	2500
V071	Electronics	300 x 300	130 x 330 x 460	400	3000

DIGITAL HOTPLATES

GENERAL FEATURES

- Electronic temperature control and digital display (3 digits). Subplate Adjustable temperature from ambient +5 to 200 ° C. stability ± 0.5 ° C.
- Resolution 1 º C.
- Temperature sensor PT 100.
- Built the hotplate in hard aluminum teflon coated grinding and heating elements surrounding the entire surface.
- Excellent thermal insulation that prevents the transmission of heat to the cabinet where the control elements.
- Insulating spacer stainless steel heater. AISI 304.
- Stainless steel upper cabinet. AISI 304.
- Button to select and temperature reading.

Code	Temperature control	Internal Dimensions (mm) D x W	Ext. Dimensions (mm) H x W x D	Temperature maxim(ºC)	Power(W)
V072	Digital	240 x 240	130 x 250 x 420	200	700
V073	Digital	200 x 400	130 x 220 x 570	200	800
V074	Digital	250 x 600	130 x 270 x 770	200	1000

SAND BATH

Features

Adjustable temperatures on plate surface up to 400°C. Temperature regulation by energy pulse regulator. Un-deformable steel hot plate with surrounding heating elements. Stainless steel uppercase AISI-304. Control panel with pilot-lights indicator of connection to the mains and heating functioning. Removable tray of stainless steel, allows using the apparatus as a hot plate.

SAND BATH

Code	Temperature control	Internal dimensions W x H x D (mm)	Ext. Dimensions (mm) H x W x D	Temperature maxim(°C)	Power(W)
V075	Electronics	50 x 180 x 380	180 x 220 x 410	400	2300
V076	Electronics	50 x 300 x 300	210 x 320 x 350	400	2800

Code	Accesorios
V078	Stainless steel bowl plate sand bath of 190 x 220 x 480 mm.
V079	Stainless steel bowl plate sand bath of 190 x 280 x 580 mm.

V083 Warm air drier, for general laboratory purposes, to dry soil and aggregate samples.
Power supply: 230V, 50 Hz. 1500 W.

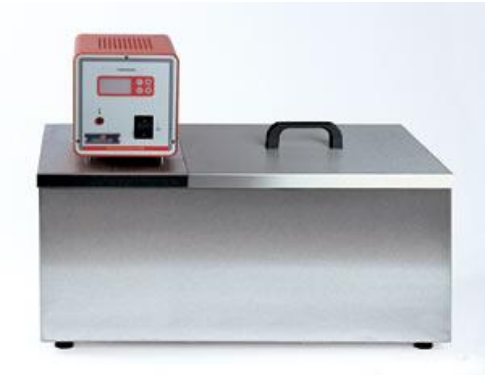
ULTRASONIC CLEANING BATHS

FEATURES

Completely transistorized built in high frequency electric generator. Working frequency 35 Khz. Temperature regulation by microprocessor with digital read out (from ambient +5º C to 90º C). Timer 0 - 99 minutes. Cleaning tray made of stainless steel 18/10. External case made of stainless steel AISI-316. Heating by semi-detached elements at the tray. Complete-half wave selector. It allows less power consume in some applications. Draining tap incorporated.

Code	Capacity litres	Inner dimensions in mm (H x W x D)	External dimensions in mm (H x W x D)	Power W	Weight Kg
V085	5,7	150x300x151	320x330x180	325	10
V086	12	150x300x240	320x330x270	550	14
V087	18	200x327x300	320x360x330	700	20
V088	20	150x505x300	320x535x330	900	23
V089	28	200x500x300	320x535x330	1000	3

BATH WITH MOVEMENT



- Equipment designed to bring liquids to room temperature, formed by a combination of immersion thermostats and a covered basin in order to provide better uniformity of the desired working temperature: It includes:

1) A double-walled metal basin of 20 or 27 litres. The interior is 18/10 stainless steel and the exterior is AISI 304 stainless steel.
2) TFB immersion thermostat positioned on the cover with an external cooling coil in order to work at a temperature close to the ambient temperature, and it includes a stirring pump with an outlet for external circulation, adjustable by an incorporated tap.
3) Drain tap included.
4) It incorporates a blind tap to completely shut off the basin.

- Resolution: 0,1ºC
- Precision: +/- 0,5% fs (full scale)
- 4 digits temperature display
- Probe type according to maximum temperature:

- Up to 99,9ºC is PTC
- Up to 250ºC Pt-100

- The temperature regulation is by digital thermostat with PID self-adjustable control.
- Manufactured according to CE directives
- Voltage: 220V/50Hz

Code	Temp. máxim (ºC)	Capacity (l)
V092	99,9	27
V093	250	27

Bank of circular hotplates 4 AND 6 POSTS

ADJUSTABLE TEMPERATURE HOTPLATE UP TO 400 °C.
SUITABLE FOR KJELDAHL DIGESTION ASSAYS AND
SOXHLET EXTRACTION.

FEATURES

Temperature control impulses independent power in each square.
Non-deformable steel hot plate with surrounding heating elements
over its entire surface.
rear bracket with adjustable height and tilt rod for easy attachment
flasks, coolants, etc.
stainless steel outdoor furniture. AISI 304.
CONTROL PANEL
Independently in each square.
- Temperature regulators impulse power.
- Lamps signaling functioning of heater. Power supply: 230V, 50H

Ref.	Number of pieces	Máxim Tª	Power (w)	Dimensions (mm) height x width x depth	Weight (kg.)
V095	4	400ºC	1600	650 x 80 x 360	8
V096	6	400ºC	2400	950 x 80 x 360	12

ELECTRONIC HEATING PLATES PC SERIES

GENERAL CHARACTERISTICS

- Circular heating plate of solid steel.
- External injection cabinet painted in epoxy.
- Maximum working temperature on plate; 350ºC.
- It incorporates a safety thermostat that disconnects the plate if the temperature exceeds 350ºC.
- Electronic voltage regulation that allows variation of the power between 10% and 100% of this voltage.
- As an option, it can be fitted with a connection in the rear end for a contact thermometer or a digital programmer.
- It is equipped with a luminous start-up switch and a pilot light to indicate the operation of the resistance.
- Manufactured according to CE directives
- Power supply: 230v/50H

Code	Dimensions (mm) height x width x depth	Area (mm)	máx Tª. (ºC)	Power (w)	Weight (kg.)
V100	180 x 125 x 220	Ø150	350	500	2
V101	180 x 125 x 220	Ø150	350	1000	2

Accessories:

Code	Accessories
V102	Rear socket for contact thermometer
V103	Support rod 12 x 450 mm

DIGITAL MGNETIC STIRRER

FEATURES

A set of digital temperature control magnetic stirrers. They come with a ceramic or an inox stirring surface. The common characteristics are the following:

- An injected housing that provides the equipment with great stability, painted in epoxy.
- Plate measures:

- Circular:150-mm ø stirring surface made of AISI 304 stainless steel or ceramic. (Version 104 and 105). Ceramic surface also available.

- Shielded heating element system with an indicator light to signal heating
- Temperature control is a digital thermostat with PID self-adjustable control
- " J " type probe
- Temperature control from ambiance up to 350º
- The stirring capacity exceeds 10l (relative to water).
- Stirring speed variable between 30 and 2100 r.p.m.
- Includes Teflon-insulated magnet. (8x40mm)
- Manufactured according to CE standards External Temperature Control: **See accessories**

Code	Power (W)	Temperature máx (ºC)	Heating surface	Dimensions (W x H x D, mm)	Precision (% F.S.)	Weight (kg.)
V104	500	350	Ceramic	180 x 125 x 220	± 0,5	3
V105	500	350	stainless steel AISI 304	180 x 125 x 220	± 0,5	3

ACCESSORIES:

Code.	Accessories
V106	Aro security
V107	Support rod 12 x 450 mm
V108	Set external probe

EN 933-9 / NF P94-068 / NF P18-592

A152 Electronic fins mixer, with digital display. Speed range between 200-2000 rpm. Supplied complete with double stir blade, support and locking nut.

A153 Electronic mixer with digital speed display, speed range 40-400 and 200-2000 rpm Accessories not included.

A153.01 Double support T, stainless steel rod. AISI 304 dia. 20 x 800 mm. high.

A153.02 Double shovel cross.

A152.02 Filter paper dia. 125 mm Pack of 100.

A152.03 Methylene Blue, Pack of 100 gr.

A152.04 Methylene Blue, Pack of 25 gr.

V7557 Burette 50 ml graduated with key.

V7558 Burette 100 ml graduated with key.

A152.05 Double fixing nut

A152.06 Solid glass rod 300 mm length

A152.07 Base plate Support

A152

A153

ANALOG MAGNETIC STIRRER

FEATURES

Set of magnetic stirrers with heating or without giving the user an interesting price / quality ratio, whose common features are:

- Furniture injection, which gives great stability to the team, painted in epoxy.
- Surface stirring circular stainless steel AISI 304 150mmø. Also available in ceramic. Refs: 111C / 113C.
- Electronic control circuits for heating and / or stirring modularly designed for easy replacement .
- Light switches and independent regulatory controls for the heating and stirring functions located on the front panel.
- The stirring capacity is more than 10l. (relative to water).
- Stirring speed variable from 30-2100 rpm
- A magnet Teflon. of Ø8x40mm Includes.
- For stirrers with heating, the heating system is by armored resistance, signaling a pilot heating incorporates.
- Manufactured according to EC directives.
- Power supply: 230v/50H. Other on request .

Code	Power (W)	Temperature máx (ºC)	Dimensions W x H x F	Heating system	Weight (kg.)
V111	500	400	180 x 125 x 220mm.	Electronic regulator 10-100% power. Making contact thermometer	3
V111-C	500	400	180 x 125 x 220mm.	Same as V111 with ceramic surface.	3
V113	500	300	180 x 125 x 220mm.	Temperature: bulb thermostat with an accuracy of ± 3 ° C	3
V113-C	500	300	180 x 125 x 220mm.	As V113 with ceramic surface.	3

BATH FOR OIL TESTING

FEATURES

- Double walled metallic construction and an exterior metal body painted in epoxy treated with antioxidant. Stainless steel 18/10 interior tub.
- Heating by means of a resistance shielded in stainless steel AISI 316.
- Temperature control by means of a digital thermostat with the following characteristics:

- Probe type is PTC with an accuracy of ±2%
- Security thermostat (according to DIN 12877 #2) if overheating occurs located in the back side of the equipment

- Aluminium block with nine cavities, specially designed for sampling edible oils according to EU Nº. L.248/67standards.
- It is supplied with a stainless steel AISI 304 support for fastening the block in the bath.
- Manufactured according to CE directives.
- Power supply: 230V/50Hz

Code	Temp.. máx (ºC)	Block Dimensions (mm) W x H x F	Dimensions (mm) ext. W x H x F	Power(W)
V115	100	45 x 240 x 240	390 x 150 x 440	1200

ELECTRONIC SCALES WITH DIGITAL DISPLAY
HAVE A WIDE RANGE OF SCALES WITH DIFFERENT CAPACITIES AND RESOLUTIONS



PRECISION BALANCES WITH DIGITAL DISPLAY
GENERAL

- LCD display with internal lighting.
- Equipped with load sensing type RM1 art.
- You have a computer or printer connection RS 232-C.
- Doubletec design, two large adjustable feet for more stability in the workplace.
- counting function.
- Filters heavy.
- Selecting multiple units.
- Automatic calibration external
- Power supply 220V with external.
- External dimensions: 210 x 340 x 160 mm.

Code	Capacity(g)	Precision(g)	Plate dimension (mm)
V120	310	0,001	110
V121	420	0,001	110
V122	500	0,001	110
V123	1000	0,001	110
V124	3100	0,01	160
V125	4200	0,01	160

ELECTRONIC SCALES WITH DIGITAL DISPLAY
GENERAL FEATUREES

- LCD display with backlight.
- Verifiable OIML Class III.
- Auto paid.
- Tare function.
- Parts counting.
- Function limits (HI_OK_LO).
- Animal weighing function.
- Low battery indicator.
- Internal rechargeable battery.

Power: 220V
Battery: Internal rechargeable 6V/4Ah
Operating temperature: -10 ° C / +40 ° C

Code	Capacity(kG)	Precision(gr)	Plate dimension (mm)
V170	15	5	442 X 332
V171	30	10	442 X 332
V172	60	5	442 X 332
V173	100	10	442 X 332
V174	150	20	530 X 430
V175	300	50	530 X 430

Different models analytical scales necessary in a laboratory

• Laboratory analytical scale.
• LCD display with internal lighting.
• counting function.
• Selecting multiple weighing filters.
• Connecting a computer or printer.
• Option Kit density.
• Selecting multiple units of measure.

Power supply: 230 V/50 Hz 11 V AC
Battery: 30 hours operating time, charging time 10 hours.
Operating temperature: +5 ° C / +35 ° C

MODELS	V140	V141	V140i	V141i
Capacity (kg)	120	220	120	220
Resolution (kg)	0,1		0,1	
Calibratión	External		automatic internal	
Weighing units	ct, dwt, g, gn, mg, mo, oz, ozt, t			
Cabinet Dimension (mm)	185 x 340 x 80			
Plate size (mm)	Dia. 80			
Balance Dimension (mm)	186 x 250 x 80			
Weight (kg)	9			

Moisture Analyzer scales of high performance

• Moisture Analyzer of high performance.
• LCD graphic display with backlight and contrast adjustment.
• Thermal response time of 50 ° C to 100 ° C in approx. 1 minute.
• Temperature range of 35 º C to 160 º C.
• External calibration.
• Adjustable timer from 1-99 minutes.
• Automatic programmable.
• Connect a PC keyboard to input RS 232-C standard.

• You can store up to 5 drying programs.
• Drying process by halogen lamps.
It has two microprocessors, one specifically designed to control all functions of weight, and one for the perfect control of all drying processes.
Power supply: 220 V / 115V
Operating temperature: +5 ° C / +35 °

Models	Capacity(g)	Precision(g)	Resolution (%)	Plate size (mm)
V139	160	0,001	0,01	100

PRECISION SCALES WITH DIGITAL DISPLAY
GENERAL FEATURES
- Protection system against overload.
- Cell highly impact resistant.
- Universal power supply available (110V/240) V-50/60Hz.
- RS-232.
- Various functions: Carat / Parts / Pounds / Ounces / Grams.
- Dimensions of scales: 215x330x95 mm - Weight 3 Kg
- Internal rechargeable battery 6V BP cc Type Ni / MH - Autonomy ± 12 h.
- Optional: Calibration Weights as models / Printer / Case Cover / USB output.

Models	Capacity(g)	Precision(g)	Plate size (mm)
V130	2000	0,01	150x150
V131	4200	0,01	150x150
V132	7500	0,1	190x190
V133PT	7500	0,1	190
V133BP	7500	0,1	190
V134R	950/7500	0,01/0,1	190
V135PT	10200	0,1	190

High Standard analytical scales
FEATURES:
Calibration weight
Autocalibration perfect "PSC". Built.
Clock Calibration "Clock-CAL".
Inbuilt clock.
Calibration Report GLP / GMP / ISO.
Window Direct. Connecting a PC without additional software.
Output measurement intervals.
RS-232-C serial bidirectional.
Software for measuring specific gravity, piece count, percentage on the screen.
Analog Display.
Hydrostatic weighing below the balance.
Metal housing. Verifiable.

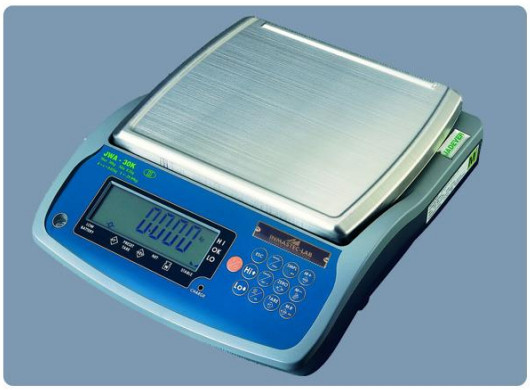
Models	Capacity (Max)	Resolution	Internal calibration	Steel Plate

V145	120 g.	0,1 mg.	SI	Ø 80
V146	220 g.	0,1 mg.	SI	Ø 80
V147	320 g.	0,1 mg.	SI	Ø 80
V148	120 g.	0,1 mg.	SI	Ø 80
V149	200 g.	0,1 mg.	SI	Ø 80
V150	320 g.	0,1 mg.	SI	Ø 80
V151	120 g.	0,1 mg.	NO	Ø 80
V151	220 g.	0,1 mg.	NO	Ø 80

INDUSTRIAL TYPE SCALES

Technical Features:

High resolution Balance
Internal 1/60.000
Calibration software.
Power supply: 110V, 220V ± 10%.
Tara all over the range.
Weighing in: grams, pounds and ounces.
Optional modules: Mini-Printer Interface, RS-232
Interface Relay.
Balance robust.
Printer Internal Module: DP-343
Keyboard with keys.
Internal rechargeable battery.
Balance dimensions: 390x345x120 mm.



Models	Capacity	Precision	Plate size
V155	3 Kilos	0,1g	320x240 mm
V156	6 Kilos	0,2 g	320x240 mm
V157	15 Kilos	0,5 g	320x240 mm
V158	30 Kilos	1 g	320x240 mm
V159	60 Kilos	2 g	320x240 mm

Industrial type scales

Specifications:

Automatic Calibration Software, Calibration menu Zero / Span.
Counters 25,50,100 pieces per sample pieces.
Blister protection powder, liquid.
Stainless steel pan.
Power supply 220/110V.
Rechargeable battery with a battery life of about 120 hours.
Membrane tactile.
Optional RS-232.e printer.
Net Weight: 5.40 kilos.

Models	Capacity	Precision	Plate size
V160	3 Kilos	0,1g	334x245 mm
V161	6 Kilos	0,2 g	334x245 mm
V162	15 Kilos	0,5 g	334x245 mm
V163	30 Kilos	1 g	334x245 mm

V165 Precision scale
Capacity: 15 Kg
Accuracy: 0.1 g
Plate oversized stainless steel of 360x320 mm.
ABS indicator heavy
Indicator Measures: 175x84x40 mm
110/240V foreign power - Output 12V 500 mA
Operating Temperature 0o - 40o
Internal rechargeable battery - charging indicator
Display 6 digits 22 mm LCD
Tara all over the range
External calibration at one point and three-point linear
Aluminum load cell

CALIBRATION WEIGHTS

Maximum permissible error in mass fractions (mg)

	1 mg	2 mg	5 mg	10 mg	20 mg	50 mg	100 mg	200 mg	500 mg
F	0.02	0.02	0.02	0.025	0.03	0.04	0.05	0.06	0.08

Maximum permissible error in mass (mg)

	1 g	2 g	5 g	10 g	20 g	50 g	100 g	200 g	500 g	1000 g	2000 g	5000 g	10000 g
F	0.10	0.12	0.15	0.20	0.25	0.30	0.5	1.0	2.5	5	10	25	50

Class F		
Gram fraction	Code	
Complete set (1-500 mg) in 12 fractions	V210	

	Class F (nickel plated brass)	Class F (Stainless Steel)	
Mass	Code	Code	
1 g	V180	V195	
2 g	V181	V196	
5 g	V182	V197	
10 g	V183	V198	
20 g	V184	V199	
50 g	V185	V200	

100 g	**V186**	**V201**	
200 g	**V187**	**V202**	
500 g	**V188**	**V203**	
1.000 g	**V189**	**V204**	
2.000 g	**V190**	**V205**	
5.000 g	**V191**	**V206**	
10.000 g	**V192**	**V207**	

V215

V218

V217

V215 Digital thermometer, range -50 º to 250 º C. With 200 mm rod to puncture. Resolution 0.1 º C to -19.9 º C to 150 º C., rest 1 º C.
V216 Digital thermometer, range -40 to 200 ° C. With 180 mm rod to puncture. Movable head. Resolution 0.1 º C to -19.9 º C to 150 º C., rest 1 º C.
V217 Digital thermometer, range -50 º to 150 º C. With 110 mm probe to puncture.

V218 Digital thermometer, for temperatures from -50 ° to +1000 ° C. Possibility of connecting 2 sensors, resolution 0.1 ° C. up 199.9 ° C, remaining 1 º C.

Accessories:
V219 Probe immersion / penetration
V220 Surface Probe
V218.01 Protective cover

ELECTRONIC DATA LOGGER THERMOHYGROGRAPHS

V225 This is a "data logger" with integrated sensor and memory capacity to store up to 20,000 measured values. Built in rugged anodized aluminum housing.
Windows Software. Comes complete with integrated probe humidity / temperature, battery, magnet, instruction manual and calibration.
Humidity range: 5-100% RH
Temperature range: -10 +50 ° C.
Accuracy: ± 3% RH / ± 0.6 ° C.
Resolution: 0.1 ° RH / 0.1 ° C.
Dimensions: 131 x 68 x 72 mm.
Lithium
Weight: 320 g.

Accessories:
V225.05 Comfort software interface.
V225.01 Carrying case

V436 Digital Timer on-table with five program channels

GLASS AND PORCELAIN

We have all kinds of glassware and porcelain laboratory

Transparent cylinders glass spouted, hexagonal base ISO 4788, DIN 12680-1

Code	Cap. ml
V6740	5
V6741	10
V6742	25
V6743	50
V6744	100
V6745	250
V6746	500
V6747	1000
V6748	2000

Beakers glass, graduated with peak high as ISO 3819, DIN 12 331

Code	Cap. ml
V6780	25
V6781	50
V6782	100
V6783	150
V6784	250
V6785	400
V6786	600
V6787	800
V6788	1000
V6789	2000
V6790	3000

Code	Cap. ml

Beakers glass, graduated
with spout, squat shape ISO 3819,
DIN 12 331

V6799	10
V6800	25
V6801	50
V6802	100
V6803	150
V6804	250
V6805	400
V6806	600
V6807	800
V6808	1000
V6809	2000
V6810	3000
V6811	5000

Graduated impurities test bottles
ISO-GL-45 with stoppered for autoclave,
blue ring ISO 4796, DIN 168

Code	Cap. ml
V7100	100
V7101	250
V7102	500
V7103	1000
V7104	2000
V7105	5000
V7106	10000
V7107	20000

Volumetric flasks, with polyethylene
Stopper. Standard:ISO 1042,
DIN 12664

Code	Cap. ml
V6358	10
V6359	25
V6360	50
V6361	100
V6362	250
V6363	500
V6364	1000
V6365	2000

Conical flasks, Erlenmeyer, graduates
wide neck

Code	Cap. ml
V6400	25
V6401	50
V6402	100
V6403	250
V6404	500
V6405	1000

Conical flasks, Erlenmeyer, graduates
Neck ISO 1773 standard

Code	Cap. ml
V6420	25
V6421	50
V6422	100
V6423	250
V6424	500
V6425	1000
V6426	2000
V6427	3000
V6428	5000

Filter flasks, glass, vacuum filtering
ISO 6556

Code	Cap. ml
V6480	250
V6481	500
V6482	1000
V6483	2000
V6485	5000
V6486	10000

Filter flasks, glass vacuum filtering

Code	Cap. ml	thread
V6490	250	29/32
V6491	500	29/32
V6492	1000	29/32
V6493	1000	45/40
V6494	2000	29/32
V6495	2000	45/40

Desiccators, cap threadedly button

Code	Dimensions mm Ø
V6160	100
V6161	150
V6162	200
V6163	250
V6164	300


V-6160

Vacuum type desiccators with key on the lid

Code	Dimensions mm Ø
V6180	100
V6181	150
V6182	200
V6183	250
V6184	300


V-6180

Porcelain perforated plate

Code	Dimensions mm Ø	Used in desiccator
V6200	90	100
V6201	140	150
V6202	190	200
V6203	240	250
V6204	290	300

Glass funnels, short branch 60º, ISO DIN 4798

Code	Dimensions mm
V6220	45
V6222	55
V6223	75
V6224	85
V6225	100
V6226	125
V6227	150
V6228	200
V6229	250
V6230	300

Watch Glass (Beaker cover)

Code	Dimensions Ø mm.
7041	40
7042	50
7043	60
7044	70
7045	80
7046	90
7047	100
7048	120
7049	150
7050	200
7051	250

Graduated pipettes, 1 stroke, qualicolor class B, ISO 648

Code	Cap. ml
V6560	1
V6461	2
V6562	5
V6563	10
V6564	20
V6565	25
V6566	50
V6567	100

Graduated pipettes, 1 stroke, qualicolor class A, ISO 648

V6560/A	1
V6461/A	2
V6562/A	5
V6563/A	10
V6564/A	20
V6565/A	25
V6566/A	50
V6567/A	100

Graduated pipettes, 2 strok, qualicor class B, ISO 648

Code	Cap. ml
V6580	1
V6481	2
V6582	5
V6583	10
V6584	20
V6585	25
V6586	50
V6587	100

Graduated pipettes, 2 strok, qualicor class A, ISO 648

V6580/A	1
V6481/A	2
V6582/A	5
V6583/A	10
V6584/A	20
V6585/A	25
V6586/A	50
V6587/A	100

Rubber pears for pipetting

Code	**V6559**

Burettes grad. Glass, with stopcock without fringe ISO 835

Code	Cap. ml
V7550	10
V7551	25
V7552	50
V7553	100

Burette grad. Glass, with stopcock With fringe

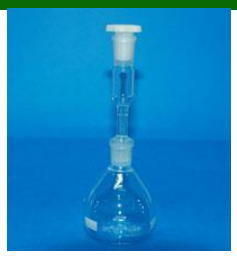
V7555	10
V7556	25
V7557	50
V7558	100

Code	Cap. ml
V5560	10
V5561	25
V5562	50
V5563	100

V5570	10
V5571	25
V5572	50
V5573	100

V5580	10
V5581	25
V5582	50
V5583	100

Gay-Lussac pycnometers
For liquid



Renault pycnometers
for solids

Pycnometers for solids and liquids
stoppered polythene

Weighing bottle, glass, with inner cover

Code	Dimensions mm.
V2320	32 x 40
V2325	40 x 25
V2330	44 x 40
V2340	50 x 40
V2350	60 x 40

Weighing bottle , glass, with external cover

V2360	22 x 35
V2370	28 x 35
V2380	44 x 40
V2390	54 x 40

Mortar and pestle, porcelain
Standard: BS 1377:2 / ASTM D421

Code	Dimensions Ø mm.	Cap. ml
V8212/00	60 x 32	25
V8212/10	70 x 37	30
V8212/15	80 x 42	50
V8212/18	90 x 46	75
V8212/20	100 x 50	110
V8212/25	110 x 56	150
V8212/30	125 x 64	220
V8212/35	140 x 71	325
V8212/40	160 x 82	500
V8212/50	180 x 90	730
V8212/60	210 x 104	1135
V8212/70	250 x 127	2250
V8212/80	300 x 150	4300

Ref.	Dimensiones mm.	Cap. ml

Porcelain crucibles
squat form

V8001/30	30 x 19	5
V8001/35	35 x 22	10
V8001/40	40 x 25	17
V8001/45	45 x 28	21
V8001/50	50 x 32	34

Porcelain crucibles
half form

V8002/35	35 x 28	12
V8002/40	40 x 32	20
V8002/45	45 x 36	30
V8002/50	50 x 40	45
V8002/60	60 x 48	80
V8002/70	70 x 56	120

Porcelain crucibles
high form

V8003/05	30 x 38	15
V8003/35	35 x 44	26
V8003/40	40 x 50	35
V8003/45	45 x 56	50
V8003/50	50 x 62	72

Pocelain lids for Crucibles

V8000/30	30 x 34
V8000/35	35 x 39
V8000/40	40 x 44
V8000/45	45 x 49
V8000/50	50 x 54
V8000/60	60 x 64
V8000/70	70 x 74

Evaporating diches, porcelain,
with sput

Ref.	Dimensiones mm.	Cap. ml
V274/10	55 x 22	18
V274/15	70 x 30	45
V274/20	85 x 32	75
V274/30	97 x 40	120
V274/40	110 x 50	200
V274/50	125 x 52	275
V274/60	140 x 55	375
V274/70	150 x 63	475
V274/80	167 x 68	660
V274/90	195 x 75	1000
V274/95	250 x 105	2500

ASTM ACCURACY THERMOMETERS

Code	ASTM	Range ºC	Div.	Immer. mm
V9101	1C	-20 +150	1º	76
V9102	2C	-5 +300	1	76
V9103	3C	-5 +400	1	76
V9105	5C	-38 +50	1	108
V9106	6C	-80 +20	1	76
V9107	7C	-2 +300	1	Total
V9108	8C	-2 +400	1	Total
V9109	9C	-5 +110	0,5	57
V9110	10C	+90 +370	2	57
V9111	11C	+6 +400	2	25
V9112	12C	-20 +102	0,2	Total
V9113	13C	+155 +170	0,5	Total
V9114	14C	038 +82	0,1	79
V9115	15C	-2 +80	0,2	Total
V9116	16C	+30 +200	0,5	Total
V9117	17C	+19 +27	0,1	Total
V9118	18C	+34 +42	0,1	Total
V9119	19C	+49 +57	0,1	Total
V9120	20C	+57 +65	0,1	Total
V9121	21C	+79 +87	0,1	Total
V9122	22C	+95 +103	0,1	Total
V9123	23C	+18 +28	0,2	90
V9124	24C	+39 +54	0,2	90
V9125	25C	+95 +105	0,2	90
V9126	26C	+130 +140	0,1	Total
V9127	27C	+147 +182	0,5	76
V9128	28C	+36,5 +39,4	0,05	Total
V9129	29C	+52,6 +55,4	0,05	Total
V9133	33C	-38 +42	0,2	50
V9134	34C	+25 +105	0,2	50
V9135	35C	+90 0170	0,2	50
V9136	36C	-2 +68	0,2	45
V9137	37C	-2 +52	0,2	100
V9138	38C	+24 +78	0,2	100
V9139	39C	+48 +102	0,2	100
V9140	40C	+72 +126	0,2	100
V9141	41c	+98 +152	0,2	100
V9142	42C	+95 +255	0,5	100
V9143	43C	-51,6 –34	0,1	Total
V9144	44C	+18,6 +21,4	0,05	Total
V9145	45C	+23,6 +26,4	0,05	Total
V9146	46C	+48,6 +51,4	0,05	Total
V9147	47C	+58,6 +61,4	0,05	Total
V9148	48C	+80,6 +83,4	0,05	Total
V9149	49C	+20 +70	0,2	65
V9150	50C	+12,2 –38,3	0,05	Total
V9152	52C	-10 +5	0,1	Total
V9153	53C	+0,6 +10,4	0,1	Total
V9154	54C	+20 +100,6	0,2	Total
V9156	56C	+19 +35	0,02	Total
V9157	57C	-20 +50	0,5	57
V9158	58C	-34 +49	0,5	Total
V9159	59C	-18 +82	0,5	Total
V9160	60C	+77 +260	1	Total
V9161	61C	+32 +127	0,2	79
V9162	62C	-38 +2	0,1	Total
V9163	63C	-8 +32	0,1	Total

Code	ASTM	Range ºC	Div.	Immer. mm
V9164	64C	+25 +55	0,1	Total
V9165	65C	+50 +80	0,1	Total
V9166	66C	+75 +105	0,1	Total
V9167	67C	+95 +155	0,2	Total
V9168	68C	+145 +205	0,2	Total
V9169	69C	+195 +305	0,5	Total
V9170	70C	+295 +405	0,5	Total
V9171	71C	-37 +21	0,5	76
V9172	72C	-19,4 –16,6	0,05	Total
V9173	73C	-41,4 –38,6	0,05	Total
V9174	74C	-55,4 –52,6	0,05	Total
V9182	82C	-15 +105	1	30
V9183	83C	+15 +70	1	40
V9184	84C	+25 +80	1	249
V9185	85C	+40 +150	1	181
V9186	86C	+95 +175	1	35
V9187	87C	+150 +205	1	40
V9188	88C	+10 +200	1	57
V9189	89C	-20 +10	0,1	76
V9190	90C	0 +30	0,1	76
V9191	91C	+20 +50	0,1	76
V9192	92C	+40 +70	0,1	76
V9193	93C	+60 +90	0,1	76
V9194	94C	+80 +110	0,1	76
V9195	95C	+100 +130	0,1	76
V9196	96C	+120 +150	0,1	76
V9197	97C	-18 +49	0,5	Total
V9198	98C	+16 +82	0,5	Total
V9199	99C	-48,4 +4,6	0,2	35
V9200	100C	+145 +205	0,2	76
V9201	101C	+195 +305	0,5	76
V9202	102C	+123 +177	0,2	100
V9203	103C	+148 +202	0,2	100
V9204	104C	+173 +227	0,2	100
V9205	105C	+198 +252	0,2	100
V9206	106C	+223 +227	0,2	100
V9207	107C	+248 +302	0,2	100
V9210	110C	-133,5 +136,4	0,05	Total
V9211	111C	+170 +250	0,2	100
V9212	112C	+4 +6	0,02	Total
V9213	113C	-1 +175	0,5	Total
V9214	114C	-80 +20	0,5	Total
V9216	116C	+18,9 +25,1	0,01	Total
V9217	117C	+23,9 +30,1	0,01	Total
V9218	118C	+28,6 +31,4	0,05	Total
V9219	119C	-38 –30	0,1	100
V9220	120C	+38,6 +41,4	0,05	Total
V9221	121C	+98,5 +101,4	0,05	Total
V9222	122C	-45 –35	0,1	Total
V9223	123C	-35 –25	0,1	Total
V9224	124C	-25 –15	0,1	Total
V9225	125C	-15 +5	0,1	Total
V9226	126C	-27 +24,6	0,05	Total
V9227	127C	-21,4 –18,6	0,05	Total
V9228	128C	-1,4 +94,4	0,05	Total
V9229	129C	+91,6 +94,4	0,05	Total
V9230	130C	-7 +105	0,5	Total
V9232	132C	+148,6 +151,4	0,05	Total

GLASS STEM THERMOMETERS
GRADUATE, MERCURY SISTEMA

GLASS STEM THERMOMETERS
GRADUATE, MERCURY SISTEMA

USE GENERAL, WHITE STRIPE

Code	Range ºC	Div.	length
V9301	-10 +60	1º	200 mm
V9302	-10 +110	1º	300 mm
V9303	-10 +150	1º	300 mm
V9304	-10 +200	1º	300 mm
V9305	-10 +250	1º	300 mm
V9306	-10 +300	1º	300 mm
V9307	-10 +360	2º	300 mm

USE GENERAL, YELLOW STRIPE

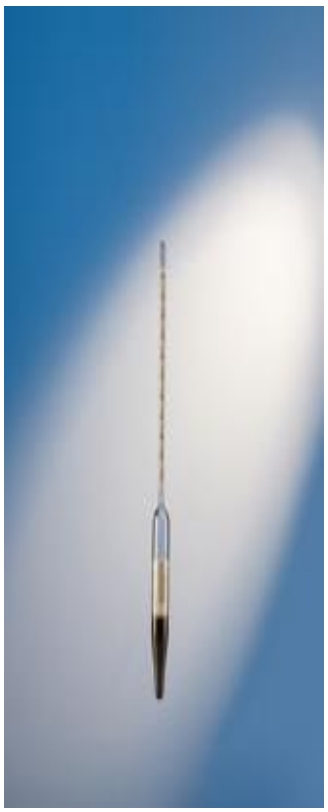
Code	Range ºC	Div.	Length
V9310	-10 +60	1º	200 mm
V9311	-10 +110	1º	300 mm
V9312	-10 +150	1º	300 mm
V9313	-10 +200	1º	300 mm
V9314	-10 +250	1º	300 mm
V9315	-10 +300	1º	300 mm
V9316	-10 +360	2º	300 mm

OPAL SCALE THERMOMETERS GRADUATE, GENERAL USE

Code	Range ºC	Div.	Length
V9320	-10 +35	0,5º	260 mm
V9321	-10 + 60	1º	260 mm
V9322	-10 +110	1º	260 mm
V9323	-10 +150	1º	260 mm
V9324	-10 +200	1º	260 mm
V9325	-10 +250	1º	260 mm
V9326	-10 +300	1º	260 mm
V9327	-10 +360	1º	260 mm
V9328	-10 +420	1º	260 mm

HYDROMETER ACCURACY, STANDARD DIN 12791

Code	Range0,050 gr/cm³	ºC	Length mm
V9350	0,600 – 0,650 x 0,0005	20	335
V9351	0,650 – 0,700 x 0,0005	20	335
V9352	0,700 – 0,750 x 0,0005	20	335
V9353	0,750 – 0,800 x 0,0005	20	335
V9354	0,800 – 0,850 x 0,0005	20	335
V9355	0,850 – 0,900 x 0,0005	20	335
V9356	0,900 – 0,950 x 0,0005	20	335
V9357	0,950 – 1,000 x 0,0005	20	335
V9358	1,000 – 1,050 x 0,0005	20	335
V9359	1,050 – 1,100 x 0,0005	20	335
V9360	1,100 – 1,150 x 0,0005	20	335
V9361	1,150 – 1,200 x 0,0005	20	335
V9362	1,200 – 1,250 x 0,0005	20	335
V9363	1,250 – 1,300 x 0,0005	20	335
V9364	1,300 – 1,350 x 0,0005	20	335
V9365	1,350 – 1,400 x 0,0005	20	335
V9366	1,400 – 1,450 x 0,0005	20	335
V9367	1,450 – 1,500 x 0,0005	20	335
V9368	1,500 – 1,550 x 0,0005	20	335
V9369	1,550 – 1,600 x 0,0005	20	335
V9370	1,600 – 1,650 x 0,0005	20	335
V9371	1,650 – 1,700 x 0,0005	20	335
V9372	1,700 – 1,750 x 0,0005	20	335
V9373	1,750 – 1,800 x 0,0005	20	335
V9374	1,800 – 1,850 x 0,0005	20	335
V9375	1,850 – 1,900 x 0,0005	20	335
V9376	1,900 – 1,950 x 0,0005	20	335
V9377	1,950 – 2,000 x 0,0005	20	335



Meker burner with gas regulator and air, the tube outer diameter at its upper end 22 mm and 175 mm. total height
V236 For butane / propane.
V237 For natural gas.

V238 Lighter Meker external diameter 27 mm and 185 mm total height.
V239 For butane / propane.
V240 For natural gas.

Bunsen burner universal, with gas and air regulator. Outer diameter of tube 11 mm. Total height 140 mm.
V243 For butane / propane.
V244 For natural gas.

V245 Burner Butane Cartridge
V246 Butane cartridge

V245

V242

V250 Support double T. Rod in stainless steel AISI 304 Ø20 x 800 mm high to support weights up to 20 kg to about 300 mm. base. Great stability. Useful for stirring support. Weight 7 kg.

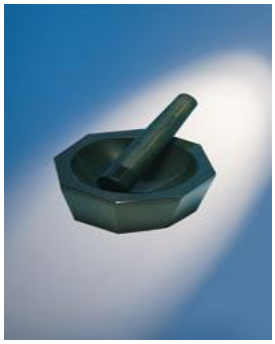
Metal stand, base Standard DIN 12892, rod in stainless steel AISI 304.

Code	Rod dimensions Ø x H mm.	Plate size Length x Width
V252	8 x 500	200 x 125
V253	10 x 600	250 x 160
V254	12 x 700	315 x 200
V255	12 x 800	315 x 200

V260 Burette clamp for nut and pipe
Made in chromed metal and pronged PVC for diameters from 7-25 mm.

V264 Burette Clamp and refrigerants.
Made in chromed metal and pronged PVC for diameter from 12 to 45 mm.

V270 Mortar and pestle, stainless, dia. 130 x 65 mm.
V271 Mortar and pestle, stainless, dia. 150 x 75 mm..



Agate mortar with pestle, made with precious stones crystal (SiO2). High resistance to chemical and physical agents (except hydrofluoric acid). Density: 2.6 g / cm 2.**V274** Mortero de Ágata de 70 ml capacidad
V275 Agate mortar of 140 ml capacity

Tripod stand galvanized steel flat ring

Code	External ring Ø	Total height mm
V280	80	210
V281	100	210
V282	120	210

Spatula flexible, stainless steel

Code	Long blademm.	Blade width mm.
V285	100	22
V286	150	22
V287	200	25
V288	240	25

V290 Hoffman screw clamp, max opening 15 mm

V291 Mohr clamp.

MIXING BOWLS, STANLESS STEEL
V292 Dia. 85 x45 mmh. 200 ml. Capacity
V293 Dia. 105 x50 mmh. 300 ml. Capacity
V294 Dia. 125 x55 mmh. 400 ml. Capacity

V270 Mortar and pestle, stainless, dia. 130 x 65 mm.

V295 Digital cernier caliper 0-150 mm capacity and 0,01 mm. resolution. Mouth 40 mm. with digital readout. Constructed according DIN 862, readings in mm and inches. Battery supply. Supplied in case.

V296 Digital vernier caliper 0-200 mm capacity and 0,01 mm. resolution. Mouth 40 mm. with digital readout. Constructed according DIN 862, read in mm and inches. Battery supply. Supplied in case.

BALL MILL

V320 Apparatus for moist grinding and dry preparation for tapping of the balls against the sample to describe a semi-circular orbit by entrainment in the cylinder engine jug. Used in laboratories of public works, paint factories, mining, ceramics, grinding of raw materials for the manufacture of pharmaceutical products and foodstuffs. Jugs isolated prevent sample contamination.
Cylinders Heavy-duty solid steel interior and exterior coated strong and flexible to permit rotation the jars without damaging them. Metal external heavy duty treatment. Illuminated pushbutton on / off. Backstop. The running time is also adjustable to 99 hours, or hold position.
Dimensions: 1250 x 490 x 340 mm.
Power supply: 220 V, 50 Hz
.

V321 1 liter Jug stainless steel.
V322 3 liter Jug stainless steel.
V323 5 liter Jug stainless steel.
V324 11 liter Jug stainless steel..
V325 15 liter Jug stainless steel.

Vacuum pump with vacuum and regulation Magnetics ventilated motor, provides an extremely silent operation without vibration or oil contamination to run dry with EPDM membrane, and head PPS / fiberglass PRIMEF, resistant to acids and solvents. It has stainless steel nozzle. Vacuum and pressure, and are therefore usable as a compressor.

Accessories:
V334 Time controller (timer) digital
V335 Digital vacuum controller

V337 Temperature controller. Range ambient from 99.9 ° C

VACUUM PUMP

Code	Vacuum mm. Hg	Presion Bar	Volume L/min	Vacuum gauge	Regulator	Dimensions cm.	Weight Kg.
V326	620	2	6			24 x 27 x 10	2,8
V327	630	2	15			24 x 27 x 10	3,8
V328	750	2	12	Yes	Yes	24 x 27 x 10	3,8
V329	750	2	30			26 x 31 x 13	5,7
V330	750	2	50			26 x 31 x 13	7,1
V331	730	2	30		NO	26 x 31 x 13	6,1

MUFFLE FURNACE HIGH TEMPERATURE

Muffle furnace up to 1800 ° C. PAD execution allows for the control and automatic regulation of the temperature by means of a pyrometer connected to the digital-type automatic regulator.
This model is designed with the most advanced technical fiber types and elements calorification insulating current market, allowing you to get a very high temperature scale in remarkably short time. Fiber plates which form the sides and roof of the chamber are supported and are anchored on a dual chamber ceramic refractory plates of the same type as the sill plate.
Uniformity ± 5%. Stability ± 2 º C.
External insulation for double chamber with forced air circulation.
Scheduler ramps 4 programs 15 segments.
Automatic digital pyrometer. microprocessor, ↗

Alarm, PID parameters. Nonvolatile memory.
Manufactured under EEC standards.
Security alarm on temperature.

CODE	Interior Dimensions mm H x W x D	External dimensions mm H x W x D	Maximum temperature º C	Power Kw	Power supply
V340	100 x 140 x 154	600 x 550 x 600	1350	4	220
V341	140 x 170 x 300	700 x 700 x 800	1375	6	220
V342	140 x 170 x 300	700 x 700 x 800	1450	7	220
V343	120 x 175 x 250	650 x 950 x 700	1450	6	220
V344	100 x 130 x 250	650 x 950 x 700	1525	7	220
V345	100 x 130 x 250	650 x 950 x 700	1650	6	220
V346	250 x 250 x 260	650 x 1000 x 800	1650	10	220
V347	150 x 150 x 150	800 x 550 x 600	1650	5	220
V348	150 x 150 x 150	800 x 550 x 600	1700	6	220
V349	250 x 250 x 260	1000 x 600 x 700	1700	10	220
V350	150 x 150 x 150	800 x 550 x 600	1800	6	220
V351	250 x 250 x 260	1000 x 600 x 700	1800	10	220
V352	400 x 400 x 400	2100 x 850 x 1000	1600-1700-1800	30	380III
V353	450 x 450 x 450	2150 x 1000 x 1200	1600-1700-1800	40	380III
V354	600 x 600 x 600	2100 x 900 x 1400	1600-1700-1800	50	380 III

MUFFLE FURNACE AT 1200 ° C.

Muffle furnace up to 1200 ° C. allows for the control and automatic regulation of the temperature by a pyrometer connected to the digital-type automatic regulator.
Microprocessor control system for programming functions and temperature ramps at different times,
Manufactured under EEC standards.
Safety switch
Security alarm.
Type K Thermocouple

1.200º C

Code	V355	V356	V357
Chamber Interior:	100 mm	150 mm	200 mm
H x W x D	150 mm	200 mm	280 mm
	200 mm.	300 mm	400 mm
External Dimensions:	505 mm	700 mm	750 mm
H x W x D	460 mm	550 mm	600 mm
	560 mm	800 mm	900 mm

Power supply	220 V	220 V	220 V

V360 Dial gauge stroke 12,5 mm, div. 0,01 mm
V361 Digital Comparator 0 to 30 mm capacity and resolution 0.01 mm. with data output
V362 Digital Comparator 0 to 50 mm capacity and resolution 0.01 mm. with data output

V363 Dial gauge stroke 5 mm, div. 0,01 mm
V364 Dial gauge stroke 10 mm, div. 0,01 mm.
V365 Dial gauge stroke 25 mm, div. 0,01 mm
V366 Dial gauge stroke 30 mm, div. 0,01 mm
V367 Dial gauge stroke 50 mm, div. 0,01 mm

V370 Magnetic support articulated
Magnetic Base prismatic vertical tower Ø 12 x 170 mm. cross tower Ø 10 x 135 mm. and approximating device. Supplied without dial.
V371 Magnetic support articulated
Magnetic Base prismatic vertical turret Ø 11 x 195 mm. turret traversal of Ø 7 x 200 mm. and approximating device. Supplied without dial.

V380 Antivibration table for scales
Designed fundamentally to counteract vibrations caused by different systems, as well the mechanical or sound.
Postforming laminate worktop constructed by its front and sides, PVC edges 3 mm. support base for balance in polishing granite plate 450x500 mm.
Antivibration system for outer cabinet protected to prevent involuntary movements within the weighing area.
These tables weighing ensure the possibility to oscillate without the dial even occasionally adverse excessively.
Dimensions: 950 x 800 x 900 mm (W x D x H)

V392 Vacuum drying oven for 50 l. Capacity
FEATURES
Adjustable temperatures: from 35º C to 200º C.
Temperature homogeneity: ± 4º C
Temperature stability:± 1º C
Temperature display accuracy:± 2º C
Maximum admissible vacuum: 0,01 mbar.
Safety according to: EN-61010-1, EN-61010-2-010.
Double safety glass against implosions according to regulations
Safety thermostat: class 2 incorporated from factory.
Time and temperature controller: digital by microprocessor.
Temperature probe: Pt 100 Class A
Epoxy resin oven painted external case. Interior made in polished stainless steel AISI 304.
Supplied with: Two perforated shelves made in aluminium with galvanic treatment.
Accessories:
V393 Vacuum pump for Vacuterm
V394 Connection Kit PC via RS232

Safety cabinet for acids and bases
COMMON FEATURES
Constructed with double wall steel 18 mm with chamber of 3.81 cm in both the top, bottom, sides and doors.
Equipped with lateral double ventilation system of 5.08 cm diameter, which incorporates a deflector hole in each fire (flame arrester).
By means of a temperature sensor, in case of fire, at 73 ° C and are closed automatically and thus the leveling feet as double aeration openings are adapted for stopping the flames.
Closing doors with mechanism three anchor points provided and a small device to keep the door open and lock.
Shelves with anchor variable and adjustable feet for proper leveling.
Surface final finish of the inner and outer chemically resistant.

Code	Capacity liters	Type doors	Shelf Number	Al / W / F (Ext.) cm	Al / W / F (Int.) cm	Weight Kg
V385	200	1 auto-closing	1	112 x 59 x 46	104 x 51 x 38	68
V386	403	2 auto-closing	1	112 x 110 x 46	104 x 102 x 38	116
V387	403	1 sliding self-closing	1	112 x 110 x 46	104 x 102 x 38	114
V388	608	1 auto-closing	2	165 x 110 x 46	157 x 102 x 38	159
V389	608	1 sliding self-closing	2	165 x 110 x 46	157 x 102 x 38	153
V390	813	2 self-closing	2	165 x 80 x 0	157 x 72 x 72	164
V391	813	1 sliding self-closing	2	165 x 80 x 0	157 x 72 x 72	161

Drying oven with natural convection, Adjustable temperature from 40 ° C to 250 ° C. Temperature homogeneity: ± 2%
Safety according to EN 61010-1, EN-61010-2-010
Outdoor furniture built in oven painted with epoxy. Inside tray, double body and counter stainless steel AISI 304. silicone gasket. Adjustable aerator
Regulating Hydraulic thermostat temperature. Analog thermometer, the internal temperature reader, electric resistance heating chamber mounted independently, which allows optimum temperature stability.
Supplied complete with two stainless steel perforated trays.

Code	Capacity	Inner dimensions in mm. H x W x D	Exterior dimensions in mm. H x W x D	Power W	Weight Kg
V395	40	400 x 350 x 300	710 x 540 x 450	900	40
V396	50	330 x 470 x 330	520 x 790 x 470	900	45
V397	90	500 x 450 x 400	810 x 640 x 550	1.200	54
V398	150	500 x 600 x 500	690 x 920 x 640	1.500	70

Drying oven, forced air circulation. Adjustable temperature from ambient +5 ° C to 250 ° C.
Temperature homogeneity: ± 1.5%
Temperature stability: ± 0.1%
Safety according to EN 61010-1, EN-61010-2-010
Outdoor furniture built in oven painted with epoxy. Inside tray, double body and counter stainless steel. AISI 304. Silicone gasket. Adjustable aeration device.
Temperature control by electronic digital microprocessor controller with PID action. Keyboard and screen microprocessor with IP-54 protection
Supplied complete with two stainless steel perforated trays.

Code	Capacity	Inner dimensions in mm. H x W x D	Exterior dimensions in mm. H x W x D	Power W
V400	43	330 x 470 x 280	520 x 790 x 470	1.000
V401	78	500 x 450 x 350	810 x 640 x 550	1.000
V402	135	500 x 600 x 450	690 x 920 x 640	1.000
V403	250	800 x 600 x 520	1100 x 750 x 760	3.000

Universal oven, with forced air circulation, 250 l capacity. Adjustable temperature from ambient +5 ° C. Up to 250 º C.
Painted external baked epoxy. Inside tray, double chamber and contra-door stainless steel. AISI 304. Silicone gasket. Adjustable aeration device.
Temperature control by electronic microprocessor controller with digital readout selection and temperature.
Time programmable temperature maintenance from OFF to 99.50 hours.
Temperature sensor PT-100
Temperature stability ± 0.1%.
Electrical resistance heating, armored stainless steel.
Comes complete with two stainless steel perforated trays with anti-rollover system.

Code	Capacity	Inner dimensions in mm. H x W x D	Exterior dimensions in mm. H x W x D	Power W	Weight Kg
V405	425	1.000 x 800 x 530	1.370 x 950 x 770	3.000	120
V406	635	1.200 x 1.000 x 530	1.570 x 1.150 x 770	3.000	140

SCANNING SPECTROPHOTOMETER UV / VIS MODEL 8001PC

V410 Fully automatic spectrophotometer to measure absorbance, transmittance and concentration of samples. Scannings performed wavelength, kinetics and function of concentration calculations. The analysis data, processes and spectra can be stored with the software of the spectrophotometer. Includes software that allows the use of the instrument via computer.
A large LCD display with adjustable lighting and membrane keyboard ensures comfortable use and as obtaining spectra displayed.
Can be performed scannings, regressions, kinetic spectra manipulation such as additions, subtractions, zoom, identify maximum and rounding and minimum peaks on its LCD.
Permanent memory for 60 data sets.
The additional program includes allows command via a PC, data download introducing a number of standard curves unlimited calculations DNA - RNA, Protein and Acid Nucleic A lower bandwidth of 2 nm. and the diffractor of beam high resolution provide a structure above. Scanning speed selectable between 100 and 5000 nm / min are achieved rapid and accurate analysis.
It is supplied with the instrument cell holder of 10 mm light path, cuvette game paired 10 mm quartz Windows program and software for the implementation of water analysis kits. Printer port and RS 232.

SPECIFICATIONS
FEATURES PARAMETERS
Wave Length range 190 - 1100 nm Base line ± 0.002 A
L increase. Diffused light wave 0.1 nm <0.05% at 340 nm/220 nm (ASTM)
Accuracy ± 1 nm wave length sample cuvette Chamber 10-100 mm step light
Reproducibility l. ± 0.2 nm wavelength
Photometric Accuracy ± 0.005 A a1, ASTM 000A lower bandwidth of 2 nm.
Diffraction beam monochromator high resolution
Photometric range -0.300 to 3, 000A, 0-150% T Silicon Photodiode Detectors 2
A kinetic wavelength deuterium light source UV lamp
Stability 0.0003 to light (500nm in 1h) Lamp. halogen Vis
Interface RS232, printer (serial, par) (auto switch selectable)
Scanning speed of 100-5000 nm / min Screen / Keyboard lit LCD, 320x240 mm
Scanning range 190 -1100 nm
Dimensions: 50x43x22 cm (W x L x H)
Power supply: 110 to 230V, 50 / 60Hz.
Weight: 18 kg

*** We have other models Spectrophotometers, colorimeter, photometers, etc.. consult information**

LABORATORY FURNITURE

Laboratory Furniture research and development.
Made of steel frame and covered by different types of countertops and stainless steel, polypropylene, Gres in tile, hardwood, etc. ..
Countertops are always one of the most important components in the project design and furniture a laboratory.
The wisdom in their choice provided depending on the use to which they will devote gives durability and economy because of its resistance worktop. Request quotes.

Tables support structure in steel tube 30x30 mm protected section where they will under the same coupling different models of furniture, may be these with sockets or wheels. The easy removal of the modules under tables allows great cleaning zones. Request quotes.

V418 Emergency eyewash shower offering a practical decontamination chemical aggressions, water spray.

V419 Eyewash, made corrosion resistant plastic

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CONVERSION TABLE

AREA	AREA
1 Km² (100ka)	247.105 acres
1 hectare (ha)	2.47105 acres
	10.000 m²
1 m²	1.19599 yd²
1 cm²	0,155 pulg²/in²
1 mm²	0,00155 pulg²/in²
1 milla² /mile²	2.58999 km²
1 acre	4.046,86 m²
	0,404686 ha
1 yd²	0,836127 m²
1 pie²/ft²	0,092903 m²
1 pulg²/in²	645,16 mm²

LONGITUD	LENGTH
1 Km	0,621371 milla
1 m	1,09361 yd.
	3,2808 pie/ft
1 cm	0,393701 µ/inch
1 mm	0,03937 µ/inch
1 m	39,3701 µ/inch
1 milla/mile	1,60934 Km.
1 yd.	0,9144 m.
1 pie/ft	0,3048 m
1 pulg/in	25,4 mm
1 milipulg/mili-in	25,4 µm
1 plg/ in	0,0254 µm

PRESIÓN	PRESSURE
1 Pa (N/m^2)	1 Pa /N/m^2)
	0,01 Kgf/cm^2
	10 mbar
1 Kpa (KN/mm^2)	20,885 Ibf/pie^2/ft^2
	0,2953 pulg/in
	merc. (Hg)
1 Kgf/cm^2	**98,0665 Kpa**
	14,223 Ibf/pulg^2/ft^2
1 bar	**100 Kpa**
	14,5038 Ibf/pul^2/ft^2
1 mbar	**100 Pa**
	2,0885 Ibf/pul^2/ft^2
1 atm	**133.322 Pa**
	0,01934 Ibf/pul^2/ft^2
1 mm Hg (torr)	**133.322 Pa**
	0,01934 Ibf/pul^2/ft^2
1 mm H_2O	**9.80665 Pa**
	0,001422 Ibf/pul^2/ft^2
	6,89476 Kpa
1 Ib/pulg^2/in^2	0,07031 Kgf/cm^2
	68,9476 mbar
1 Ib/pie^2/ft^2	**47,8803 Pa**
	0,4788 mbar
1 ton/pie^2/ft^2	**107,252 Kpa**
	1,094 Kgf/cm^2
1 pulg/in. Hg	**3,38639 Kpa**
	0,491 Ibf/pulg^2/in^2
	2,98907 Kpa
1 pie/ft H_2O	0,030 Kgf/cm^2
	22,3997 mm Hg.

DENSIDAD	DENSITY
1 Kg. m²	1,686 Ib/yd²
	0,06243 Ib/pie²/ft²
1 gr. Cm²	62,4280 Ib/pie²/ft²
1 ton/yd²	1328,94 Kg/ cm²
1	0,593 Kg/ cm²
1 Ib/pie²/ft²	16,0185 Kg/ cm²
1 Ib/pulg²/in²	27,6799 gr/ cm²

MASA	MASS
1 tm (metric)	**1000 Kg**
	2204,62 Ib
	0,98420 ton
1 Kg	0,0968 cwt
	2,20462 Ib
1 gr.	0,03527 oz
1 ton (long)	**1016,05 Kg**
	1,01605 tm
1 cwt (50 kg)	**50,8023 Kg.**
1 Ib	0,45359 Kg.
1 oz	28,349 gr.

FUERZA	FORCE
1 N	0,10197 kgf
	0,22481 Ibf
1 KN	101.971 Kgf
	224,809 Ibf
1 Kgf	**9,80665 N**
	2,20462 Ibf
1 Dina	10-5 N
	0,224809 x 10^{-5} ibf
I bf	**4,44822 N**
	0,45359 Kgf
1 tonf	9,96402 KN
	1016,05 kgf

POTENCIA	POWER
1 hp (imp)	745,700 W (J/s)
1 hp (metric)	735,499 W (J/s)
1 hp (electric)	746.000 W (J/s)
1 pie.Ibf/s	1,35582 W

ENERGÍA	ENERGY
1 mj	0,277778 KWh
1 J	0,737562 pie/ft Ibf
1 Kgf m	**9,80665 J**
	7,23301 pie/ft/Ibf
1 term/therm	**105,506 MJ**
1 Kwh	**3,6 MJ**
1 Btu	**1,05506 KJ**

VOLUMEN	VOLUME
1 m^3	1,30795 yd^3
	0,03531 pie^3/ft^3
1 dm^3 (litro/litre)	0,21997 gal imp.
	1,7605 pintas
	0,2642 gal. U.S.
1 cm$^{3\,(ml)}$	0,06102 pulg^3/in^3
1 yd^3	0,76455 m^3
1 pie^3 /ft^3	28,3168 dm^3
1 pulg^3/in^3	16,3871 dm^3
1 gal imp.	4,50609 dm^3
1 gal U.S.	3,78541 dm^3
1 pinta	0,56826 dm^3
1 oz. Fl.	28,4134 cm^3

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INDUSTRIES OF TECHNICAL EQUIPMENT AND MATERIAL TESTING INSTRUMENT

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