Aggregates

47 | Geometrical properties
48 | Mechanical and physical properties

Mineral aggregates are used in all fields of the construction industry to produce bituminous mixtures, concrete, mortars to be used in structures, fill materials, railway ballast, etc. For this reason we have given particular attention to all testing methods. The new EN standards, which in the majority of cases correspond to ASTM and old National standards, have grouped all tests on aggregates in five main subjects: Tests for general properties of aggregates / Tests for geometrical properties of aggregates / Tests for mechanical and physical properties of aggregates / Tests for thermal and weathering properties of aggregates / Tests for chemical properties of aggregate.
Sections 47 and 48 include all testing equipments required by the above specifications.


SKID RESISTANCE TESTER
CONTROLS

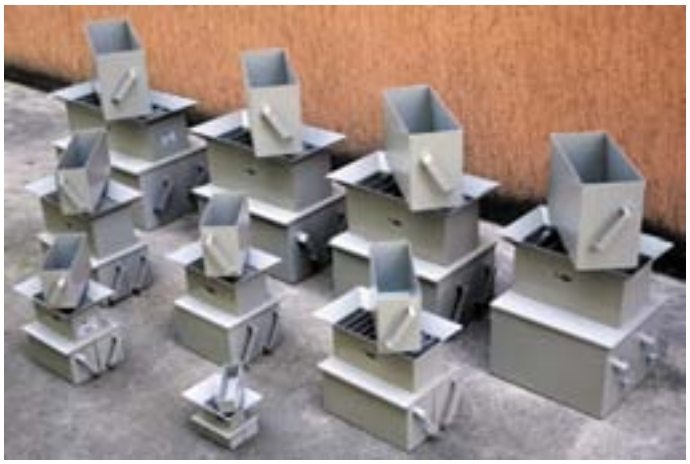
Sampling

Riffle boxes (Sample splitters)

Standards

EN 932-1 | 932-2 | ASTM C136 | ASTM C702 | AASHTO T27

Note: *for complete details and information see pages 21*



15-D0438 to 15-D0438/H delivered with 3 pans.

Ordering information

15-D0438
EN riffle box, 7 mm slot width.

15-D0438/A
EN riffle box, 15 mm slot width.

15-D0438/B
EN riffle box, 30 mm slot width.

15-D0438/C
EN riffle box, 50 mm slot width.

15-D0438/D
EN riffle box, 19 mm slot width.

15-D0438/F
EN riffle box, 38 mm slot width.

15-D0438/G
EN riffle box, 64 mm slot width.

15-D0438/H
EN riffle box, 45 mm slot width

Mini stainless steel sample splitter

15-D0431
Stainless steel sample splitter, sixteen 5 mm slots

15-D0431, delivered with 3 pans.

86-D1180/1, 16-D1179/A

Large capacity sample splitter

15-D0430
Large capacity sample splitter.

15-D0430

Accessories

86-D1601
Round aluminium scoop, 325 ml capacity.

86-D1602
Round aluminium scoop, 1000 ml capacity.

86-D1603
Round aluminium scoop, 2600 ml capacity.

86-D1601 to 86-D1603

86-D1645
Shovel.

86-D1180/1
Soil mortar.

16-D1179/A
Rubber-headed pestle.

15-D0439
Quartering canvas to ASTM C702. 2x2 m.

EN Test sieves

Standards

EN 933-2 | ISO 3310-1 | ISO 3310-2 | ISO 565

200 to 450 mm diameter woven cloth and perforated metal plate sieves.

Note: *for complete details and information see pages 12, 13*

ASTM test sieves

Standards

ASTM E11

8" (203.2 mm) and 12" (304.8 mm) diameter woven wire and woven cloth sieves.

Note: *for complete details and information see pages 14*

Determination of particle shape: flakiness index

Bar sieves (Grids)

Standards

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

Used to determine the flakiness index of aggregates. Aluminium frame and steel bars.

Weight: 3 kg per unit, 42 kg complete set (approx.)

Bar sieves

Ordering information

Individual sieves

47-D0418/01
Bar sieve (Aggregate grid), 2.50 mm opening.

47-D0418/02
Bar sieve (Aggregate grid), 3.15 mm opening.

47-D0418/03
Bar sieve (Aggregate grid), 4.00 mm opening.

47-D0418/04
Bar sieve (Aggregate grid), 5.00 mm opening.

47-D0418/05
Bar sieve (Aggregate grid), 6.30 mm opening.

47-D0418/06
Bar sieve (Aggregate grid), 8.00 mm opening.

47-D0418/07
Bar sieve (Aggregate grid), 10.00 mm opening.

47-D0418/08
Bar sieve (Aggregate grid), 12.50 mm opening.

47-D0418/09
Bar sieve (Aggregate grid), 16.00 mm opening.

47-D0418/10
Bar sieve (Aggregate grid), 20.00 mm opening.

47-D0418/11
Bar sieve (Aggregate grid), 25.00 mm opening.

47-D0418/12
Bar sieve (Aggregate grid), 31.50 mm opening.

47-D0418/13
Bar sieve (Aggregate grid), 40.00 mm opening.

47-D0418/14
Bar sieve (Aggregate grid), 50.00 mm opening.

Complete set

47-D0418/B
Complete set of 14 Bar sieves (Aggregate grids) with 2.50, 3.15, 4.00, 5.00, 6.30, 8.00, 10.00, 12.50, 16.00, 20.0, 25.00, 31.50, 40.0, and 50mm openings.

Flakiness and elongation index: BS method

Flakiness sieves

Standards

BS 812:105.1

Used to determine if aggregate particles are to be considered flaky, i.e. their thickness is less than 0.6 of their nominal size. Each sieve is made from heavy gauge steel. Sieves can also be purchased individually - see ordering information.

Weight: 2.4 kg per unit, 15 kg complete set (approx.)

Ordering information

Individual sieves

47-D0415/1
Flakiness sieve, 4.9 x 30 mm slot.

47-D0415/2
Flakiness sieve, 7.2 x 40 mm slot.

47-D0415/3
Flakiness sieve, 10.2 x 50 mm slot.

47-D0415

47-D0415/4
Flakiness sieve, 14.4 x 60 mm slot.

47-D0415/5
Flakiness sieve, 19.7 x 80 mm slot.

47-D0415/6
Flakiness sieve, 26.3 x 90 mm slot.

47-D0415/7
Flakiness sieve, 33.9 x 100 mm slot.

Complete set

47-D0415
Set of 7 Flakiness sieves with 4.9 x 30, 7.2 x 40, 10.2 x 50, 14.4 x 60, 19.7 x 80, 26.3 x 90, and 33.9 x 100 mm slots.
Link to other products

Thickness gauge

Used to determine if aggregate particles are to be considered flaky, i.e. their thickness is less than 0.6 of their nominal size. Alternatively, for large sample analysis, the 47-D0415 set may be preferred.

Dimensions: 383 x 150 x 6 mm
Weight: 600 g (approx.)

Ordering information

47-D0540
Thickness gauge.

Length gauge

Used for determining the elongation index of aggregates. Aggregate particles are considered elongated when their length is more than 1.8 of their nominal size. Made of a wooden base with brass plate and steel pins.

Dimensions: 360x75x71 mm
Weight: 1 kg (approx.)

Ordering information

47-D0541
Length gauge.

47-D0541 & 47-D0540

Shape index

Standards

EN 933-4 | 933-5 | 933-7 | DIN 4226 | CNR N° 95 | NLT 354

Used to determine the shape factor of aggregates. Supplied complete with carrying case.

Dimensions (case): 470 x 170 x 50 mm
Net weight: 500 g

Ordering information

47-D0542

Shape index gauge.

47-D0542/A

Shape index gauge with traceable certificate.

47-D0542

Flat and elongated particles in coarse aggregates

Standards

ASTM D4791

47-D1656

Proportional caliper conforming to ASTM D4791.

Used for the rapid and easy determination of percentage of flat particles, elongated particles, or both in coarse aggregate fractions of 9.5 mm (3/8") or larger.

It consists of a 6" x 16" (152.4 x 406.4 mm) base plate with four rubber feet, two fixed posts and a 13" (330 mm) pivoting arm. The positioning of the pivoting arm allows ratios of 1:2, 1:3, 1:4, or 1:5 to be obtained.

Weight: 3.2 kg (approx.)

47-D1656

Determination of the efflux index

Standards

EN 933-6 | ASTM C1252 | CNR 113

47-D0516/A

Efflux index apparatus.

Used to obtain information about the shape and angularity of grains in the 0.063-4 mm fraction of aggregates. It consists essentially of a container which ends in a 12 mm diameter funnel with a 60° opening. Supplied complete with both sizes of funnel, control shutter and cylindrical feed hopper.

Dimensions: 200 x 200 x 420 mm
Weight: 9 kg (approx.)

47-D0516/A

Assessment of fines: sand equivalent test

Standards

EN 933-8 | ASTM D2419 | AASHTO T176
NF P18-898 | UNE 83131
UNI 8520-15 | CNR N° 27

Sand equivalent test sets

These test sets are proposed in two versions: EN and ASTM. Both comprise the following:

- Measuring cylinders - qty 4
- Rubber stopper - qty 2
- Measuring can
- Irrigator tube
- Siphon assembly with bottle
- Weighted foot
- Funnel
- Graduated rule
- Stock solution (1 litre)

All items are housed in a carrying case (except the siphon assembly with bottle and the stock solution, that are packed separately).

The two sets are identical except for the four measuring cylinders which are totally graduated in the ASTM/AASHTO version, and the weighted foot which has slight differences between versions.

All components can be puchased individually-see Spare parts.

For reliable test results we recommend the use of a mechanical shaker.

Dimensions: 500 x 400 x 130 mm
Total weight: 7 kg (approx.)

Ordering information

47-T0050/B
Sand equivalent test set conforming to EN 933-8 and NF, UNE, UNI and CNR standards.

47-T0050/C
Sand equivalent test set conforming to ASTM D2419 and AASHTO T176.

Accessories

47-T0050/7C
Sand equivalent stock solution, 125 cc bottle. Pack of 20.

47-T0050/8
Clamp stand set. Holds siphon assembly in place during the test.

15-D2185/J
Stainless steel test sieve, 200 mm diameter, 2 mm opening (for UNI 8522-15).

Spare parts

47-T0050/1A
Measuring cylinder conforming to EN.

47-T0050/1C
Measuring cylinder conforming to ASTM/AASHTO.

47-T0050/2
Rubber stopper.

47-T0050/3
Measuring can.

47-T0050/4
Irrigator tube.

47-T0050/5
Siphon assembly with bottle.

47-T0050/6
Weighted foot conforming to ASTM/AASHTO.

47-T0050/61
Weighted foot conforming to EN.

47-T0050/7
Sand equivalent stock solution, 1 L bottle.

86-D1546
Funnel.

82-D1694
Graduated rule, 500 mm.

Sand equivalent shakers

The shakers provide a completely uniform shaking action at a specified rate and eliminate operator fatigue. In the 47-T056/C version the machine stops automatically when the safety cover is opened, in conformance with CE directives.

Specifications

Stroke: adjustable 200 ± 10 mm
Rate: 175 strokes/min
Dimensions: 720 x 420 x 450 mm
Weight: 20 kg (approx.)
Complete with timer

Ordering information

47-T0056/B
Motorized sand equivalent shaker. 230 V, 50 Hz, 1 ph.

47-T0056/BY
As above but 220 V, 60 Hz, 1 ph.

47-T0056/BZ
As above but 110 V, 60 Hz, 1 ph.

47-T0056/C
Motorized sand equivalent shaker with safety cover, conforming to CE directives. 230 V, 50 Hz, 1ph.

47-T0056/CY
As above but 220 V, 60 Hz, 1 ph.

47-T0056/CZ
As above but 110 V, 60 Hz, 1 ph.

47-T0050/B with 47-T0050/7. The 47-T0050/C version is identical except for the graduation of the cylinders andsome small differences in the weighted foot.

47-T0056/B

47-T0056/C

Assessment of fines: methylene blue test

Standards

EN 933-9 | NF P94-068 | UNE 83 180 | UNI 8520-15

This test is performed to determine the clay content in the fines fraction of aggregates.
Weight: 10 kg (approx.)

The test set includes:

47-D0439/C1
50 cc burette with stopcock.
47-D0439/C2
Support base with clamp.
47-D0439/C3
Filter paper. Pack of 100 discs.
47-D0439/C4
Glass rod, 300 x 8 mm diameter.
86-D1075
1000 ml capacity beaker.
47-D0439/C9
Methylene blue, 250 g.
47-D0439/C10
Kaolinite, 1000 g.
47-D0439/C11
Electric agitator, 400 to 700 rpm, 75 mm diameter impeller. Complete with support base and double sleeve. 230 V, 50 Hz, 1 ph.

All the above mentioned items can be purchased individually.

Ordering information

47-D0439/C
Methylene blue test set. 230 V, 50 Hz, 1 ph.

Accessories

47-D0439/C9S
Methylene blue, 6x10 g
47-D0439/C13
Automatic bottle top dispenser 0 - 10 ml, 0.1 mm graduations.
Note: this item replaces the 47-D0439/C1 and 47-D0439/C2 burette with support base.
47-D0439/C15
Plastic pan.

Spare parts

47-D0439/C3
Filter paper. Pack of 100 discs.
47-D0439/C4
Glass rod, 300 x 8 mm diameter.
86-D1075
1000 ml capacity beaker.
47-D0439/C9
Methylene blue, 250 g.
47-D0439/C10
Kaolinite, 1000 g.
47-D0439/C11
Electric agitator, 400 to 700 rpm, 75 mm diameter impeller. Complete with support base and double sleeve. 230 V, 50 Hz, 1 ph.

47-D0439/C

Determination of clay, silt and dust in fine and coarse aggregates: BS method

Standards

BS 812

Bottle roller

Used for rotating a glass bottle containing samples as described in BS 812, at a speed of 80 ± 20 rpm.
Power: 90 W
Dimensions: 424 x 195 x 275 mm (w x d x h)
Weight: 8.5 kg (approx.)

Ordering information

47-D0439/A
Bottle roller. 230 V, 50 Hz, 1 ph.
47-D0439/1
Airtight glass container, 1 litre capacity.

47-D0439/A with 47-D0439/1

Andreasen pipette with stand

47-D0439/B
Andreasen pipette, 25 ml capacity.

The 25 ml capacity Andreasen pipette is used to extract precise quantities of suspension ready for analysis. Made from glass.
Weight: 700 g (approx.)

22-T0062/2A
Pipette stand.

The pipette stand is used to precisely raise or lower the Andreasen pipette to its required level without disturbing the suspension.
Weight: 4.6 kg (approx.)

47-D0439/B with 22-T0062/2A

Assessment of fines: grading of fillers (air jet sieving)

Standards

EN 933-10

15-D0413
Digital Air Jet sieve shaker.
230 V, 50-60 Hz, 1 ph.
Note: *for complete information see page 15*

15-D0413

Determination of resistance to fragmentation

Standards

EN 1097-2 | EN 12697-17 | ASTM C131 | AASHTO T96 | NF P18-573 | CNR N° 34

Los Angeles machine

This test procedure is for determining the resistance of coarse aggregates to abrasion.

The machine consists of a rolled steel drum with an inner diameter of 711 mm and inner length of 508 mm. The drum is rotated by a speed reducer driven by an electric motor at a speed of between 31 and 33 rpm. The machine is equipped with an automatic counter which can be used to set the required number of revolutions of the drum. The unit is supplied without the abrasive charge, which has to be ordered separately depending on which standard is being followed - see Accessories.

The machine can be fitted inside a noise reduction and safety cabinet or simple safety cabinet, both conforming to CE directives. These versions come complete with a switch that stops the machine when the door is opened and have the control panel mounted externally. See accessories

Specifications

Power: 740 W
Dimensions: 975 x 785 x 937 mm (approx.)
Weight: 350 kg (approx.)

Ordering information

Standard models

48-D0500/D

Los Angeles abrasion machine, 230 V, 50 Hz, 1 ph.

48-D0500/DY
As above but 220 V, 60 Hz, 1 ph.
48-D0500/DZ
As above but 110 V, 60 Hz, 1 ph.

Accessories

48-D0505

Set of 12 abrasive charges conforming to ASTM/AASHTO standards.

48-D0505/A

Set of 12 abrasive charges conforming to EN standards.

48-D0500/D with 48-D0505

Noise reduction and safety cabinets, 48-D0500/CB1 and 48-D0500/CB2

The Los Angeles machines can be fitted inside the protection cabinets, conforming to CE requirements. The cabinets are manufactured from sheet steel and fitted with electric safety device which stops the rotation of the drum when opening the door. The 48-D0500/CB2 version is also lined internally with soundproofing material to reduce the noise.

- Dimensions (wxdxh): 975 x 785 x 937 mm
- Weight approx.: 150-180 kg

Ordering information

48-D0500/CB1

CE compliant safety cabinet with door opening switch for Los Angeles machine.

48-D0500/CB2

Noise reduction and CE compliant safety cabinet with door iopening switch for Los Angeles machine.

48-D0500/D fitted inside the CE cabinet 48-D0500/CB2 Double access doors and top door to make easy all load and unload operations.

Determination of the resistance to wear

Standards

EN 1097-1 | EN 13450 | NF P18-572 | NF P18-576 | UNE 83115 | CNR N° 109

Micro-Deval testing machine

This machine is used to determine the resistance to wear of aggregates. The frame is constructed from steel and can hold four cylinders 200 mm diameter x 154 mm long (EN 1097-1) or two cylinders 200 mm diameter x 400 mm long (EN 13450). The top section of the machine is enclosed in a soundproof safety cabinet that conforms to CE requirements and automatically stops the machine when it is opened. The machine comes complete with a counter for setting the number of revolutions and includes the four standard cylinders 200 mm diameter x 154 mm length.

The 400 mm long cylinders and steel spheres are not included and have to be ordered separately - see Accessories.

Specifications

Power: 1100 W
Dimensions: 1070 x 470 x 1025 mm (w x d x h)
Weight: 135 kg (approx.)

Ordering information

48-D5242

Micro-Deval testing machine with soundproof safety cover conforming to CE requirements. Complete with four stainless steel cylinders 200 mm diameter x 154 mm long. Steel spheres not included - see Accessories. 230 V, 50 Hz, 1 ph.

48-D5243
As above but 220 V, 60 Hz, 1 ph.

48-D5244
As above but 110 V, 60 Hz, 1 ph.

Accessories

Conforming to EN 1097-1

48-D0524/7

Stainless steel spheres, 10 mm diameter. 20 kg pack.

Conforming to EN 13450

48-D0524/8

Stainless steel cylinder, 200 mm diameter x 400 mm length.

Note: *abrasive charge (steel spheres) not required.*

Conforming to NF P 18-576

48-D0524/1

Steel spheres, 30 mm diameter. Pack of 10.

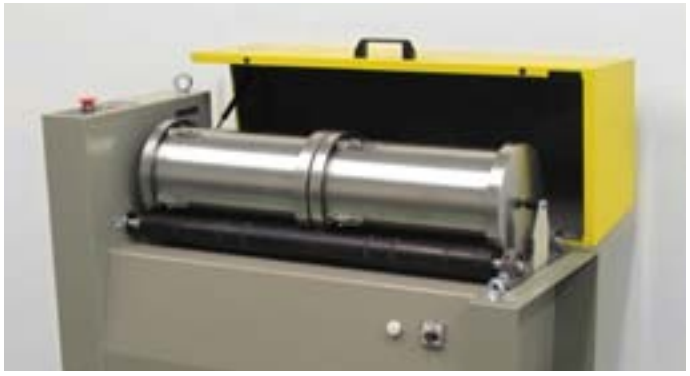
48-D0524/2

Steel spheres, 18 mm diameter. Pack of 50.

Spare parts

48-D0524/4

Stainless steel cylinder 200 mm diameter x 154 mm length.



48-D5242 with two 48-D0524/8 cylinders, 200 mm diameter, 400 mm long

main features

- Complete with four stainless steel cylinders 200 mm diameter x154 mm long
- Suitable for rolling two 200 mm diameter x400 mm long cylinders
- Revolutions setting counter included
- Enclosed in soundproof safety protection conforming to CE requirements

48-D5242. Internal view of the soundproof safety cover conforming to CE requirements

48-D5242

Abrasion resistance: Deval method

Standards NF P18-577

48-D0523

Deval abrasion test machine.

Used for testing the abrasion resistance of aggregates, this machine has a rotating frame that holds two steel cylinders and comes complete with covers and locking device. The rotating frame is driven by a motor/speed reducer. An automatic counter is included forsetting the required number of revolutions

Specifications

- 230 V, 50 Hz, 1 ph.
- Rotation speed: 33 rpm
- Power rating: 736 W
- Dimensions: 1500 x 500 x 700 mm
- Weight: 190 kg (approx.)

48-D0523

Determination of aggregate abrasion value (AAV)

Standards EN 1097-8 | BS 812

48-D0522

AAV Abrasion machine

This test provides a measure of the resistance of an aggregate to surface wear by abrasion. The machine, formerly known as the "Dorry abrasion machine", consists of a 600 mm diameter cast iron grinding disc which rotates on a horizontal plane at a speed of 28/30 rpm. Abrasive sand is fed across the surface of the specimen through a special funnel. The machine is supplied complete with two specimen moulds, two trays, two flat plates, weights and clamps.

Specifications

- 230 V, 50 Hz, 1 ph.
- Overall dimensions: 800 x 700 x 1100 mm
- Weight: 200 kg (approx.)

Accessories

86-D1672

Soft hair brush, 3 mm diameter.

48-D0522/2

Graded sand, 50 kg sack.

Determination of the polished stone value (PSV)

Standards

EN 1341 | EN 1342 | EN 1097-8 | EN 1343

Accelerated polishing machine

This machine is used to measure the resistance of road stone to the polishing action of vehicle tyres on a road surface, simulating actual road conditions, and is used in conjunction with the Skid Resistance Tester to determine the Polished Stone Value (PSV). The machine is electronically controlled by a digital unit with a 4-row x 20-character LCD display and is fitted with an emergency stop button.

It is supplied complete with road wheel, side plate, rubber rings, two tyred wheels, drive belt, abrasive feed mechanism, corn emery, flour emery, tool kit, set of two specimen moulds and two mouldplates.

main features

- > Fully conforms with EN 1097-8
- > Advanced digital interface for programming test steps and pauses
- > Independent control of the two feeders
- > Digital control of speed rotation
- > Full protection of all the moving part areas with safety switch
- > Removable water tank, easy to refill

Technical specifications

- Electronic control of rotation speed and feed mechanism
- Digital 4-row x 20-character display
- Aluminium wheel, 406 mm diameter
- Clamping device for specimen
- Rotation speed adjustable from 315 to 325 rpm
- Two rubber-tyred wheels, 200 ±3 mm diameter
- Lever arm and weight loading the tyred wheel on the aluminium wheel to 725 ±10N
- Microprocessor-controlled feed mechanism for corn emery and flour emery
- Electric motor: 750 W
- Rated power: 850 W
- Overall dimensions: 1800 x 980 x 510 mm (h x w x d)
- Weight: 200 kg (approx.)

Ordering information

48-PV5262
Accelerated polishing machine.230 V, 50 Hz, 1 ph.

48-PV5263
As above but 220 V, 60 Hz, 1 ph.

48-PV5264
As above but 110 V, 60 Hz, 1 ph.

Accessories

48-PV0525/12
Corn emery, 5 kg pack.

48-PV0525/13
Flour emery, 5 kg pack.

48-PV0525/14
Control stone (ungraded), 50 kg bag.

48-PV0525/15
Friction tester reference stone (Criggion stone-ungraded), 25 kg bag.

48-PV5262

Skid resistance and friction tester (Skid Tester)

Standards ASTM E303 | EN 1097-8 | EN 1338 | EN 1341 | EN 1342

Used for the measurement of surface friction properties, this apparatus is suitable for both site and laboratory applications. It can be used for determining the Polished Stone Value (PSV) using curved specimens obtained from accelerated polishing tests performed by the Accelerated polishing machine (conforming to EN 1097-8), and also for testing Paving Stones (EN 1341, EN 1342) and Paving Blocks (EN 1338).

The apparatus, originally developed at the Transport and Research Laboratory U.K., consists of an adjustable pendulum arm and a spring loaded rubber slider (see Accessories) mounted on the end of the arm. During operation the pendulum is raised and then released to swing freely, allowing the edge of the rubber slider to skid across the surface of the road or sample.

Two versions are available:
48-B0190/A conforming to ASTM E303 standard;

48-B0190/E conforming to EN 1097-8 and all other mentioned EN standards.

The pendulum is supplied complete with:

- Additional scale for tests on Polished Stone Value specimens
- Thermometer with range 0 to 220°C for surface temperature measurement
- Washing bottle, 1 L capacity for surface wetting
- Tool set with case for machine assembly
- Rule for sliding length verification
- Carrying case
- Traceable certificate of conformity to EN 1097-8 or ASTM E303
- Three rubber sliders for site use

Case dimensions: 790 x 760 x 320 mm
Weight, including case: 34 kg (approx.)

Ordering information

48-PV0190/A
Skid resistance and friction test set (Skid tester) conforming to ASTM E303 standard, comprising additional scale for PSV, 3 rubber sliders for site use, thermometer, washing bottle, tool set with case for machine assembly, rule, carrying case and traceable certificate of conformity to ASTM E303.

48-PV0190/E
Skid resistance and friction test set (Skid tester) conforming to EN 1097/8 standard, comprising additional scale for PSV, 3 rubber sliders for site use, thermometer, washing bottle, tool set with case for machine assembly, rule, carrying case and traceable certificate of conformity to EN 1097-8.

Accessories

Rubber sliders

48-PV0190/1
Mounted rubber slider, TRL rubber, 32 mm width.

48-PV0190/2
Mounted rubber slider, TRL rubber, 76 mm width.

48-PV0190/6
Mounted rubber slider, 4S rubber, 32 mm width.

48-PV0190/7
Mounted rubber slider, 4S rubber, 76 mm width

Base plates

48-PV0190/4
Metal base plate to clamp the Polished Stone Value specimen.

48-PV0190/5
Metal base plate for testing surface friction properties of Natural stones (EN 1341, EN 1342) and Paving blocks (EN 1338).

48-PV0190/E Skid resistance tester

main features

- New low friction release mechanism of the pendulum arm for better accuracy
- Extremely light pointer, for high-precision results.
- Slider lifting system integrated into the pendulum foot that guarantees reliable adjustment operations
- Strong and sturdy twin column structure
- Easy and reliable height adjusting system
- Integrated additional scale for tests on PSV specimens
- Complete with calibration certificate to EN 1097-8 or ASTM E303

48-PV0190/A – 48-PV0190/E complete set

Rubber sliders

48-PV0190/5

Abrasion resistance of natural stones and concrete tiles for external paving

Standards

EN 1341 | EN 1342 | EN 1338 | EN 1339 | EN 1340 | EN 14157 | EN 12808-2

48-D0471

Abrasion testing machine for natural stones and concrete tiles

This machine has been developed for determining the resistance to abrasion/wear of natural stones and concrete products. It is easy to use, with electronic control of the disc speed and auto shut-off of the machine at the selected number of revolutions. It comes complete with an aspirator to collect powders. The abrasion disc wheel is 70 mm thick. 5 kg of white corundum FEPA grit size 80 and a calibration sample (Boulonnais marble) are included.

The machine can also be converted, using the conversion kit 48-D0471/K, for abrasion tests conforming to EN 1344, 10545-6, 14617-4, 12808-2 and UNE 127024 - see Accessories.
The standard version conforms to EN 1338, 1339, 1342, 14157, 1340 and 1341.

Technical specifications

230 V, 50-60 Hz, 1 ph.
Power: 500 W
Overall dimensions: 620 x 670 x 850 mm
Weight: 85 kg (approx.)

Accessories

48-D0471/K

Conversion kit to perform the abrasion test conforming to EN 1344, 10545-6, 14617-4, 12808-2 and UNE 127024. Comprising counterweight, hopper, abrasion disc (200 mm diameter x 10 mm thick) and silica calibration plate.

Spare parts

48-D0471/1

Abrasive white corundum sand 80 grade. 25 kg pack.

48-D0471

Abrasion resistance of natural stones used for flooring in buildings

(Method Böhme)

Standards

EN 1338 | EN 1339 | EN 1340 | EN 13748 | EN 13892-3 | EN 14157 | DIN 52108

Abrasion tester acc. to Böhme

This machine is used to determine the abrasion resistance of natural stones and concrete products used for internal and external paving. The machine has a rotating grinding wheel of 750 mm diameter. The specimen is positioned in a suitable holder and submitted to a test force of 294 ±3 N.

An abrasive material is continuously poured onto the disc and the abrasion effect is measured after a number of rotating cycles.

The abrasive powder is not included and has to be ordered separately - see Accessories.

Technical specifications

- 230 V, 50 Hz, 1 ph.
- Disc diameter: 750 mm
- Rotation speed: 30 rpm
- Power rating: 800 W
- Overall dimensions: 1200 x 760 x 1054 (h) mm
- Weight: 220 kg (approx.)

Ordering information

48-D5272

Boehme Abrasion Tester for testing concrete paving stones, concrete slabs, concrete kerb stones, natural stone, paving stones and natural stone Slabs. 230 V, 50 Hz, 1 ph.

48-D5273
Same as above but 220 V, 60 Hz, 1 ph
48-D5274
Same as above but 110 V, 60 Hz, 1 ph

Accessories

48-D0471/1

Abrasive white corundum sand 80 grade, 25 kg pack.

48-D5272

Detail of 48-D5272

Aggregate impact value: BS and NF method

Standards

BS 812 | NF P18-574

48-D0515/A

Impact testing machine

48-D0515/A

This machine is used to determine the aggregate impact value (AIV) which provides a relative measure of the resistance of an aggregate to sudden shock or impact. The machine is robustly designed and made from corrosion-resistant steel. It is fitted with a counter to check the number of blows delivered to the sample and comes complete with two cylindrical measures (BS and NF) and a tamping rod.

Overall dimensions: 444 x 300 x 879 mm
Weight: 58 kg (approx.)

Detemination of the aggregate crushing value: BS method

Standards

BS 812:110

Aggregate crushing value apparatus

Two versions of this apparatus are available: 150 (standard) and 75 mm diameter; both sets comprise a cylinder, plunger, base plate, tamping rod and measure. The cylinder, plunger and base plate are made from special alloy steel, hardened to 650 HV (57.8 HRC), and protected against corrosion.

Ordering information

48-D0510

Aggregate crushing value apparatus, 150 mm diameter. Weights (approx.) 16.5 kg

48-D0511

Aggregate crushing value apparatus, 75 mm diameter. Weights (approx.) 3.5 kg

48-D0510, 48-D0511. Strictly conforming to BS: Hardened to 650 HV (57.8 HRC)

Crushing resistance of lightweight aggregates

Standards

EN 13055-1

Crushing resistance apparatus for lightweight aggregates

Two versions are available:

Method 1: 48-D0512, apparatus with cylinder with inner diameter 113 mm;

Method 2: 48-D0512/A, apparatus with cylinder inner diameter 76 mm.

Ordering information

48-D0512

Apparatus for the determination of the crushing resistance of lightweight aggregates. 113 mm inner diameter, conforming to Method 1. Weights (approx.): 15 kg

48-D0512/A

Apparatus for the determination of the crushing resistance of lightweight aggregates. 76 mm inner diameter, conforming to Method 2. Weights (approx.): 7 kg

48-D0512

Glass measuring cylinder and steel plunger for lightweight aggregates

86-D1006

Graduated glass cylinder, 1000 ml capacity.
Weight approx.: 0,6 kg

22-T0060/8

Steel plunger with perforated plate.
Weight: 0.4 kg (approx.)

Scratch hardness: ASTM method

Standards

ASTM C235

48-D0518

Scratch hardness apparatus

This apparatus is used in the field to determine the quantity of soft particles in coarse aggregate. It consists of a metal rod with a rounded point of 1.6 mm diameter, which is mounted in a device so that a load of 8.9 ± 4 N is applied to the test specimen.

Dimensions: 150 x 200 x 320 mm
Weight: 8 kg (approx.)

48-D0518

Determination of loose bulk density and voids

Standards

EN 1097-3

In terms of operating principles, also comparable with: ASTM C29, ISO 6872, BS 812, UNI 8520-6, CNR N° 62, CNR N° 63 and CNR N° 64

Bulk density measures

Stainless steel construction with handles. The top rim is smooth and plane and parallel to the bottom in accordance with the standards.

Ordering information

48-D0446/1
Bulk density measure, 1 litre capacity.
Weight: 1.4 kg (approx.)

48-D0446/5
Bulk density measure, 5 litre capacity.
Weight: 4.9 kg (approx.)

48-D0446/10
Bulk density measure, 10 litre capacity.
Weight: 7.4 kg (approx.)

48-D0446/20
Bulk density measure, 20 litre capacity.
Weight: 11.9 kg (approx.)

Accessories

34-T0099
Straight edge.

22-T0040/1
Glass plate 300 x 300 mm.

48-D0446/1, 48-D0446/5, 48-D0446/10. Stainless steel construction.

Determination of the voids of dry compacted filler

Standards

EN 1097-4 | BS 812 | NLT 177 | CNR N°23

48-D0447

Filler compaction apparatus

This apparatus is used for the determination of the voids content of dry compacted filler. It consists essentially of three components:

- A metal base sized 100x150 mm;
- A cylinder 25 mm inner diameter;
- A plunger of a diameter that allows it to slide freely in the cylinder without lateral play.
- It can be fitted with a Blow counter kit - see Accessories.

Weight: 3.5 kg (approx.)

Accessories

48-D0447/1
Blow counter kit.

48-D0447/2
Filter paper, 25 mm diameter. Pack of 100.

48-D0447

Determination of particle density and water absorption

Standards

EN 1097-6 | EN 12390-7 | BS 812 | BS 1881:14 | UNI 6394-2

Only the apparatus produced specifically for the test are described here. Many other items of laboratory equipment such as balances, ovens, sieves and containers are required for this group of tests, especially since the introduction of the new EN 1097-6 Standard, which encompasses more methods than those specified by the national Standards. For more information ask for our Buyer's Guide which details each individual Standard.

Specific gravity frame and Density baskets

This apparatus is used, together with a suitable electronic balance, for determining the specific gravity of aggregates. A purpose built robust frame supports the electronic balance, while the lower part of the frame incorporates a moving platform which holds the water container, allowing test specimens to be weighed in both air and water.

The balance is not included and should be selected according to the weighing range required. Any type of electronic balance fitted with an under-bench weighing facility can be used. All our balances have this feature - our model 11-D0630/30, 30 kg capacity, 0.5 g resolution is ideal for this and other applications. See Accessories or, for other capacities, see page 9

The frame has to be completed with the Density basket 11-D0612/1.

Overall dimensions:400 x 650 x 1000 mm
Weight: 25.5 kg (approx.)

Ordering information

11-D0612/B
Specific gravity frame.

11-D0612
Density basket, stainless steel, 200 mm diameter x 200 mm height, 3.36 mm mesh size (No. 6 ASTM).

11-D0612/1
Density basket, stainless steel, 250 mm diameter x 250 mm height, 3.36 mm mesh size. Suitable for up to 15 kg of aggregates.

11-D0630/30
Electronic top loading balance, 30 kg capacity, 0.5 g resolution.

11-D0612/B with 11-D0612/1 Density basket and 11-D0630/30 electronic balance

11-D0612/1, 11-D0612

Pyknometers

We produce two series of pyknometers:

86-D1040 to 86-D1042 series suitable for aggregate particles passing the 4 mm test sieve and retained on the 0.063 mm test sieve;

86-D1037 to 86-D1038 wide-necked series suitable for aggregate particles passing the 31.5 mm test sieve and retained on the 4 mm test sieve.

Weights: from 0.5 to 1 kg each (approx.)

Ordering information

Wide-necked pyknometers for 4 to 31.5 mm particle sizes

86-D1037

Wide-necked pyknometer, 500 ml capacity, complete with stopper, capillary tube and funnel.

86-D1038

Wide-necked pyknometer, 1000 ml capacity, complete with stopper, capillary tube and funnel.

86-D1037, 86-D1038, 48-D0440

Standard pyknometers for 0.063 to 4 mm particle sizes

86-D1040

Pyknometer, 500 ml capacity, complete with stopper.

86-D1041

Pyknometer, 1000 ml capacity, complete with stopper.

86-D1042

Pyknometer, 2000 ml capacity, complete with stopper.

86-D1040, 86-D1041

48-D0441

Glass jar supplied complete with cone and rubber seal.
Capacity: 1 kg
Weight approx.: 500 g

48-D0441

48-D0440

Sand absorption cone and tamper

Sand absorption cone, 40 mm top diameter, 90 mm bottom diameter, 75 mm high, plus tamper.
Weight: 0.6 kg (approx.)

Aggregate density by water displacement: BS method

Standards

BS 812

48-D0442

Volumeter for coarse aggregates

Used to determine the density of coarse aggregates, this apparatus consists of a cylindrical metal container 163 mm diameter and 370 mm high, fitted with a siphon tube 250 mm from the base.

Weight: 2.5 kg (approx.)

Accessories

86-D1004

Graduated glass cylinder 250 ml capacity.

48-D0442

48-D0440

Surface moisture of fine aggregates: ASTM method

Standards

ASTM C70, AASHTO T142

48-D0460

Chapman flask

Used for determining the amount of surface moisture in fine aggregates. The flask is graduated to 200 ml between the two bulbs and from 375 to 450 ml above the second bulb.

Weight: 500 g (approx.)

48-D0460

Moisture measurement of sand, aggregates, building materials and mixes

48-D0462

Microlance instant moisture and temperature tester

This instrument measures the moisture and temperature of building materials at depths up to 1 m approx., simply by insertion. The digital readings are shown instantly. The Microlance has a built-in computer, which gives it the flexibility to handle a wide range of materials and water contents. The meter comes with standard calibration for sands and aggregates, but is easily re-calibrated in the field for virtually any material or mixture using the built-in "Autocal" facility.

Complete with calibration certificate.

Technical specifications

- Battery: 4x1.5 V AA cells
- Typical range: Moisture 0-35%; Temperature -20 to 60°C
- Resolution: Moisture 0.1%; Temperature 0.1°C
- Accuracy: Moisture: better than 0.5% over a given range; Temperature: better than 0.5°C
- Measurement principles:
  - Moisture: temperature compensated electric field
  - Temperature: BS 1904 – DIN 751
- Platinum resistance detector
- Total length: 1.2 m (approx.)
- Weight: 2 kg (approx.)

main features

> Suitable for sands, aggregates, building materials and mixes

> Provides quick on-site moisture measurement from small batches to hundreds of tons

> Ideal in the processes of concrete manufacture, brick making, ceramics etc.

48-D0462 in different working positions

48-D0462 Detail

Determination of resistance to freezing and thawing

Standards

EN 1367-1

Also comparable to: ASTM C671, ASTM C682, BS 812:124, UNI 8520-20 and CNR N° 80

Two versions of this advanced climatic chamber are offered:

- 10-D1429 - temperature controlled from -25 to +60°C, for testing aggregates in conformance with EN 1367-1 as well as other similar tests on concrete and other construction materials, and
- 10-D1429/A- temperature and humidity controlled from -25 to +60°C and 10 to 95% respectively, for aggregates and various other applications such as concrete and cement specimen curing (EN 12390-2, EN 196-1).

Both models can be upgraded with an internal data recording facility, data output port and dedicated PC software. See accessory 10-D1429/REC.
For the determination of resistance to freezing and thawing of aggregates, the accessory 48-D0457 should be used - see Accessories.
For a complete description and full product information see page 7

Ordering information

main features

- Advanced controller with cycle programmer for 50 programs and 1000 segments
- Temperature sensor can be positioned anywhere inside the cabinet or inside the sample, in conformance with requirements of the standards
- High accuracy: ±1°C, ±5%RH (RH with 10-D1429/A model only)
- A multipurpose climatic chamber suitable for testing applications in aggregates, cement, concrete, bricks, blocks, asphalt and other construction materials
- Optional internal data recording facility, data output port and dedicated PC software.

10-D1429

Temperature controlled cabinet, 520 litre capacity, temperature range -25 to +60°C. 230V, 50-60Hz, 1ph.
10-D1429/Z
As above but 110V, 60Hz, 1ph.

10-D1429/A

Temperature and humidity controlled cabinet, 520 litre capacity, temperature range -25 to +60°C, humidity range from 10 to 95%. 230V, 50-60Hz, 1ph.
10-D1429/AZ
As above but 110V, 60Hz, 1ph.

Accessories

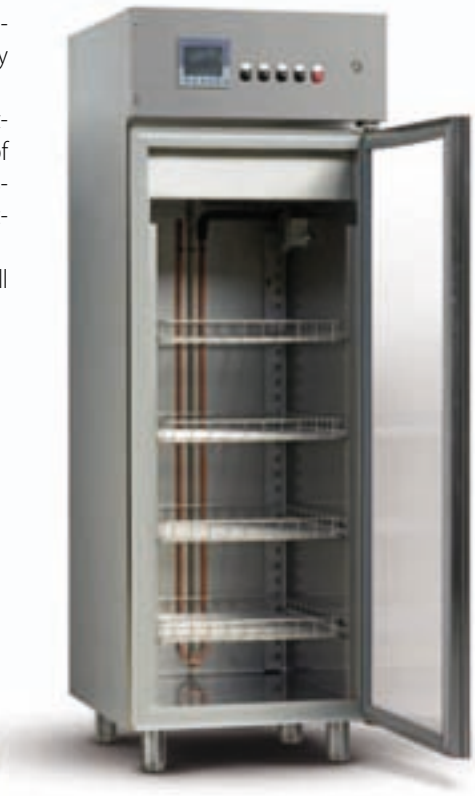
10-D1429/REC

Upgrade of the cabinet controller with internal data recording facility, data output port and dedicated PC software.
Note: This upgrade must be factory installed.

48-D0457

Metal can, 2000 ml capacity with removable lid and 1kg ballast. Conforming to EN 1367-1. Used, in conjunction with the 10-D1429 Temperature controlled cabinet, for determining the resistance to freezing and thawing of aggregates including lightweight types.
Weight: 2.5 kg (approx.)

48-D0457



10-D1429, 10-D1429/A

Magnesium sulphate test

Standards

EN 1367-2

Also comparable to: ASTM C88, UNE 7136 and UNI 8520-10

Only the apparatus produced specifically for the test are described here. Many other items of laboratory equipment such as balances, ovens and sieves are also required. For more information ask for our Buyer's Guide.

Stainless steel basket, Container and Hydrometer

Ordering information

48-D0612/11

Stainless steel mesh basket, 120 mm diameter x 160 mm high, 3.35 mm openings.
Weight: 0.3 kg (approx.)

86-D1348

Lever lid container, 180 x 240 mm diameter.
Weight: 0.2 kg (approx.)

48-D0452

Hydrometer range 1200 to 1300 g/ml, accuracy 0.001 g/ml
Weight: 0.1 kg (approx.)

48-D0612/11

86-D1348

Soundness of aggregates by use of sodium sulphate or magnesiom sulphate

Standards

ASTM C88

Only the apparatus produced specifically for this test are described here. Many other items of laboratory equipment such as balances, ovens and sieves are also required. For more information ask for our Buyer's Guide.

Stainless steel baskets

Ordering information

48-D0612/A1

Stainless steel mesh basket, 600 µm opening (No. 30 ASTM), 120 mm diameter, 160 mm high.

Weight: 0.3 kg (approx.)

48-D0612/A2

Stainless steel mesh basket, 1.7 mm opening (No. 12 ASTM), 120 mm diameter, 160 mm high.

Weight: 0.3 kg (approx.)

48-D0612/A3

Stainless steel mesh basket, 9.5 mm opening (3/8"), 200 mm diameter, 200 mm high.

Weight: 1 kg (approx.)

48-D0612/A3, 48-D0612/A2

Determination of drying shrinkage

Standards

EN 1367-4

48-D0453

Drying shrinkage prism mould

Used for determining the effect of aggregates on the drying shrinkage of concrete. The test is based on the testing of concretes of fixed mix proportions and aggregates of 20 mm maximum size. To complete the test, the Length comparator with the 62-L0034/3 should also be used - see Accessories.

Three gang, 50 x 50 x 200 mm, complete with steel inserts

Made from steel.

Weight: 8 kg (approx.)

Accessories

62-L0035/A

Digital length comparator 12.5 x 0.001 mm, with output for PC connection (serial cable required). For more information see page 341

82-D1261/LINK

Serial cable for PC connection.

62-L0034/3

Reference rod, 205 mm length.

48-D0453

Determination of resistance to thermal shock

Standards

EN 1367-5

This test involves heating soaked aggregates to 700°C for 3 minutes and comparing the loss in fines and the strength loss, determined in accordance with EN 1097-2, before and after the heat, using the appropriate accessories (see Accessories).

High capacity muffle furnace

Floor-mounted muffle furnace, fitted with an electronic thermoregulator and 24 hour timer. The internal dimensions of the furnace are suitable to receive the 48-D0454/1 test plate.

Technical specifications

- 1100 °C maximum temperature.
- 220-380 V, 50-60 Hz, 3 ph.
- Maximum temperature: 1100°C
- Furnace inner dimensions: 300 x 220 x 500 mm(wxhxd)
- Power: 9000 W
- Overall dimensions: 750 x 1650 x 1100 mm(wxhxd)
- Weight: 400 kg (approx.)

Ordering information

10-D1419

High capacity muffle furnace, 220-380 V, 50-60 Hz, 3 ph.

Accessories

48-D0454/1

Metal test plate, 440 x 240 x 4 mm thick with 12 mm high turned lip.

48-D0454/2

Metal support frame for metal test plate.

48-D0454/3

Fireproof plate 450 x 250 x 10 mm thick.

48-D0454/4

Stainless steel sieve fabric, 2 mm aperture, 250 x 445 mm size.

10-D1419

Potential alkali-silica reactivity of aggregates

Standards

ASTM C289 | NF P94-048 | UNI 85209-22

This test method covers chemical determination of the potential reactivity of an aggregate with alkalis in Portland-cement concrete. Only the specific Reaction container required for performing the test is described here but other apparatus are also needed, for example, grinding equipment (see 48-D0544 page…), constant temperature water bath (see 76-B0066/A page 453), scales, balances, glassware, etc. For more information ask for our Buyer's guide. The UNI 8520-22 standard also requires Three-gang prism moulds 25 x 25 x 280 mm, for determining the dimensional variations caused by alkalis.

48-D0545

Reaction container

Made from stainless steel and fitted with an airtight cover.

Capacity: 59 cm^3 approx.
Inner diameter: 38.1 mm
Weight: 2 kg (approx.)

48-D0545

62-L0009/A

Three-gang prism mould 25x25x280 mm conforming to UNI 8520-22.

Used for determining the dimensional variations of mortar specimens caused by alkalis and hydroxides. Made of steel with minimum surface hardness of HV 200, gauge lenght 294 mm.

Weight: 4.5 kg (approx.)

Accessories

62-L0035/A

Length comparator, digital gauge 12.5x0.001 mm, with output for PC connection (special cable required, see 82-D1261/LINK). For more information see page 341

82-D1261/LINK

Serial cable for PC connection.

62-L0034/11

Reference rod. Gauge length 294 mm.

Spare parts

62-L0009/1

Spare plugs for 62-L0009/A. Pack of 20 pieces.

48-D0850/A Color standard glass scale

Standards

ASTM C40

Used for determining the organic impurities in fine aggregates by the colorimetric method together with the organic impurities test bottles. 5 colored glass mounted in plastic holder.

Weight: 150 g approx.

48-D0850/A

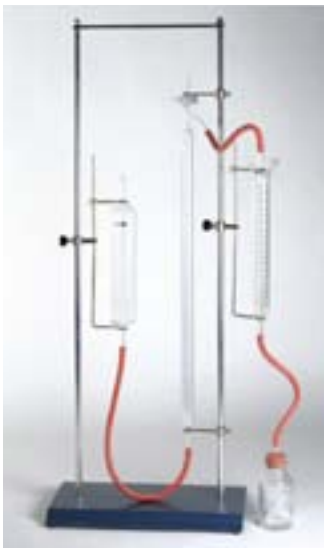
Carbonate content of aggregates

48-D0570

Dietrich-Frühling Gasometer

This apparatus is used for the determination of $CaCO_3$, especially in limestone and lime marl. It consists of a glass container in which the reaction between the calcium carbonate contained in the product and a solution of hydrochloric acid takes place. The gas given off is collected within the container. By measuring the volume of gas (CO_2) given off, the quantity of $CaCO_3$ contained in the sample can be calculated.

Dimensions of gasometer (assembled):
400 x 200 x 1100 mm (approx.)
Weight: 12 kg (approx.)



48-D0570

Organic impurities in fine aggregates

Standards

ASTM C40 | AASHTO T21 | UNI 8020-14

Test bottles

Ordering information

48-D1090

Graduated impurities test bottles, 500 ml, conforming to ASTM C40.

Weight: 0.2 kg (approx.)

48-D1091

Graduated impurities test bottle, 1000 ml.

Weight: 0.3 kg (approx.)

48-D1090, 48D1091

Chloride content of fine aggregates

Standards

BS 812:117 | BS 1377:3

Quantab titrators: rapid method

Quantab chloride titrators can be used for estimating the chloride content of aqueous solutions. Two models are available:

48-D0543

Quantab chloride titrator, type 1175 (711195), range 0.005% to 0.1% NaCl. Pack of 40 strips.

48-D0543/A

Quantab chloride titrator, type 1176 (711196), range 0.05% to 1% NaCl. Pack of 40 strips.

48-D0543, 48-D0453/A

Sample reduction

Standards

ASTM C289

The standard states that crushing and grinding equipment must be capable of reducing samples to particles that pass through a 300 µm sieve. All the models of mill and crusher proposed here meet and exceed these requirements.

48-D0530/A

Jaw laboratory crusher

Used to crush samples when a reduction in particle size is necessary, for example crushing core samples and similar materials and crushing aggregates down to 5 mm particle size. The crusher is supplied with a separate control console and safety devices conforming to CE requirements.

Technical specifications

- 230 V, 50-60 Hz, 1 ph.
- Jaw opening: 90 x 60 mm
- Jaw crushing adjustment: 5 to 15 mm
- Feed capacity: 100 to 400 kg per hour
- Power rating: 736 W
- Overall dimensions: 885 x 390 x 1169 mm (w x d x h)
- Weight: 135 kg (approx.)

48-D0530/A

48-D0535/A

Hammer mill

The hammer mill is used to further reduce the particle size of samples previously crushed to 5 mm with the Laboratory crusher 48-D0530/A, in order to perform various tests such as the chemical properties of aggregates. The grinding operation is achieved through the combination of three actions: impact, shear and rebound. After entering the grinding chamber through the hopper, the material is ground to the required fineness, down to 1 mm particle size, and is then delivered to the collector through the filtering hoses. The machine is supplied complete with screens of 3, 2 and 1 mm opening. The material retained on the 1 mm screen can be further reduced to pass the 300 µm sieve using the Jar mill 48-D0544.

Technical specifications

- 380 V, 50 Hz, 3 ph.
- Grinding chamber 180 mm diameter
- 3-4 interchangeable fixed hammers
- Output grain size "rise" type (4-5 mm)
- Possibility to mount screens with the desired opening size
- Maximum hardness of the material to grind: 6-7 Mohs
- Maximum capacity: 50 kg/h
- Power: 500 W
- Dimensions: 500 x 60 x 900 mm
- Weight: 64 kg (approx.)

48-D0535/A

48-D0544

Jar mills

Designed for milling aggregate samples to reduce particle sizes down from 1-5 mm(depending on hardness) to pass through a 300 µm sieve. The machine is fitted within a noise reduction cabinet with a safety switch for safe operation conforming to CE directives. Fitted with a 0-99 minute electronic timer, the mill can drive jars of 300 cm^3 for 150 g of dry product and 1000 cm^3 for 500 g of dry product. The jar has be ordered separately (see Accessories).

Technical specifications

- 230 V, 50 Hz, 1 ph.
- Power rating: 370 W
- Overall dimensions: 730 x 350 x 445 mm
- Weight: 55 kg (approx.)

Accessories

48-D0544/1

Alumina jar, 300 cm^3 capacity, for 150 g of dry product, complete with grinding load.

48-D0544/2

Alumina jar, 1000 cm^3 capacity, for 500 g of dry product, complete with grinding load.

48-D0544/1, 48-D0544/2

48-D0544