

# 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 related 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 areas:

- 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.

## Aggregates

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# Determination of particle shape: flakiness index

**STANDARD**

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

**BAR SIEVES (GRIDS)**

Used to determine the flakiness index of aggregates. Aluminum 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

**STANDARD**

- ▶ BS 812:105.1

**FLAKINESS SIEVES**

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.)



47-D0415

**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.



**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-D0415/4**

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.

**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.



## Shape index apparatus

**STANDARD**

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

**47-D0542  
AGGREGATE SHAPE GAUGE**

Used to determine the shape factor of the aggregates. Supplied complete with carrying case. Dimensions (case): 470x170x50 mm Net weight: 500 g



47-D0542

## Determination of the efflux index

**STANDARD**

- ▶ EN 933-6 ▶ CNR 113

**47-D0516/A  
EFFLUX INDEX APPARATUS**

Used to obtain information about the shape and the angularity of grains of the 0.063-2 mm fraction of aggregates. It consists essentially of a container, which ends in a funnel 12 mm dia. with 60° opening; control shutter and cylindrical feed hopper.

Dimensions: 200x200x420 mm Weight approx.: 11 kg



47-D0516/A

## Flat and elongated particles in coarse aggregates

**STANDARD**

- ▶ ASTM D4791

**47-D1656  
PROPORTIONAL CALIPER**

Use for the rapid and easy determination of percentage of flat particles, elongated particles, or both in coarse aggregate fractions of 9.5mm (3/8 in) or larger. Weight: 3.2 kg



47-D1656

## Assessment of fines: Sand equivalent test sets

**STANDARD**

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

**SAND EQUIVALENT TEST SETS**

Available in two versions:

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

**47-T0050/C**  
Sand equivalent test set conforming to ASTM and AASHTO



Both versions comprise 4 measuring cylinders, 2 rubber stopper, measuring can, irrigator tube, siphon assembly with bottle, weighted foot, funnel, graduated rule, 1 l stock solution.

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. All components can be purchased individually-see Spare parts. Dimensions: 500 x 400 x 130 mm Total weight: 7 kg (approx.)

**Accessories and spares**

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

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

**47-T0050/1A**  
Measuring cylinders, EN

**47-T0050/2C**  
Measuring cylinders, ASTM/AASHTO

**47-T0050/2**  
Rubber stopper

**47-T0050/3**  
Measuring can

**47-T0050/4**  
Siphon assembly

**47-T0050/6**  
Weighted foot ASTM/AASHTO

**47-T0050/61**  
Weighted foot EN

**47-T0050/7**  
Sand equivalent stock solution, 1 l bottle

**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

- 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 directive. 230 V, 50 Hz, 1 ph



47-T0056/B



47-T0056/C

## Assessment of fines: methylene blue test

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**STANDARD**

- ▶ 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.)

**47-D0439/C**  
Methylene blue test set. 110-230 V, 50-60 Hz, 1 ph.

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 ml.

**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.

**Accessories**

**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.

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

**STANDARD**

- ▶ 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 liter capacity.

**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/A with 47-D0439/1



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

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

**DIGITAL AIR JET SIEVE SHAKER**

**STANDARD**

- ▶ EN 196-6 ▶ EN 933-10

**15-D0413/A**  
Digital Air Jet sieve shaker.  
110-230 V, 50-60 Hz, 1 ph.

**Note:** for complete information see page 15



15-D0413/A



47-D0439/C

## Determination of resistance to fragmentation

### STANDARD

- ▶ EN 1097-2 ▶ ASTM C131 ▶ AASHTO T96 ▶ NF P18-573
- ▶ EN 12697-1 ▶ EN 12697-43 ▶ CNR N°34

### LOS ANGELES MACHINE

The machine consists of a rolled steel drum having an inside dia. of 711 mm and internal length 508 mm. The drum is rotated by a speed reducer driven by an electric motor at a speed of between 31 and 33 r.p.m. The machine is equipped with an automatic counter, which can be preset to the required number of revolutions of the drum or the total working time. The unit is supplied without the abrasive charge (steel balls), which has to be ordered separately depending on the standard in use (see accessories).

The same machine, originally developed for determining the resistance to fragmentation, is also used (without steel balls) for the determination of particle loss of porous asphalt specimens (Cantabro test EN 12697-17) and for the determination of resistance to aviation fuel (EN 12697-43). Furthermore the EN 12697-17 prescribes a chamber or enclosure for the Los Angeles machine as the temperature shall remain constant with an uncertainty of 2°C. This condition can be easily obtained by the sound-proof and security cabinet 48-D0500/CB2 which is necessary to comply with the CE directive.

- Dimensions approx: 1005 x 820 x 950 mm
- Weight approx.: 350 kg

### Ordering information

#### 48-D0500/G

Los Angeles abrasion machine with graphic display and membrane keyboard. 230 V, 50 Hz, 1 ph

#### 48-D0500/GY

as above but 220 V, 60 Hz, 1 ph

#### 48-D0500/GZ

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

### NOISE REDUCTION AND SAFETY CABINETS

The Los Angeles machines can be fitted inside the protection cabinets, conforming to CE requirements.

Two versions are available:

#### 48-D0500/CB1

Safety cabinet conforming to CE requirements

#### 48-D0500/CB2

Safety and noise reduction cabinet, lined internally with soundproofing material.

They are both provided with door opening switch for external control of the machine.

- Dimensions (wx dxh): 1122 x 975 x 1292 mm
- Weight approx.: 85 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 opening switch for Los Angeles machine.



Detail of digital display



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



Los Angeles model 48-D0500/G

## Determination of resistance to wear

**STANDARD**

- ▶ EN 1097-1 ▶ EN 13450 ▶ NF P18-572 ▶ NF P18-576
- ▶ UNE 83115 ▶ CNR N° 109 ▶ ASTM D6928 ▶ ASTM D7428



**MICRO-DEVAL TESTING MACHINE**

This machine is used to determine resistance to wear of aggregates. It consists of a motor driven actuator (including inverter) which transmits the rotation directly to the jars. Each jar is complete with attachment transferring the rotation to the proximal jar. The direct application of the rotation force provides strict compliance to the rotating speed prescribed by the Standards.

It is equipped with an automatic counter which can be either preset to total number of revolutions or total working time. The moving parts are enclosed in a CE-conforming soundproof safety cabinet which automatically stops the machine if open. It can be positioned either on a working table or on the dedicated base available as an optional accessory. It is supplied without cylinders and steel spheres which are separately available to EN and ASTM. See accessories.

- Overall dimensions (l x d x h): 1325 x 635 x 395 mm
- Weight (approx.): 92 kg

**Ordering information**

**48-D5242/A**  
Micro-Deval testing machine, table mounting (steel base available as option). Complete with: CE-conforming soundproof safety cover. Drums and steel spheres not included. 230 V, 50-60 Hz, 1 ph.

**48-D5242/AZ**  
Same as above but 110 V, 60 Hz, 1 ph.

**Accessories**

**Base**  
**48-D5242/A1**  
Steel base for Micro-Deval series 48-D5242/Ax and 48-D5242/NTx

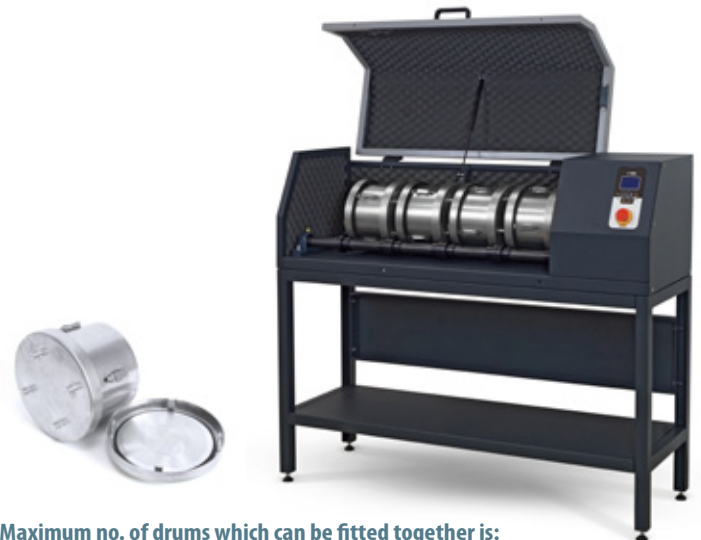
**Testing drum to EN**  
**48-D5242/EN**  
Stainless steel cylinder to EN 1097-1 for Micro-Deval series 48-D5242/Ax. Internal dia. 200 mm x 154 mm internal height.

**48-D5242/EN2**  
Stainless steel cylinder to EN 13450 for Micro-Deval series 48-D5242/Ax. Internal dia. 200 mm x 400 mm internal height.

**Testing drum to ASTM**  
**48-D5242/ASTM**  
Stainless steel cylinder to ASTM D6928 for Micro-Deval machine series 48-D5242/Ax. External dia. 194-202 mm x 170-177 mm internal height.

**FEATURES and BENEFITS**

- » Unique machine conforming to both EN and ASTM
- » Compact ergonomic table-positioning design saving laboratory space
- » High resolution graphical display 128x80 pixel and 6 keys membrane keyboard
- » Direct precise transmission of the rotation to the drums ensuring strict conformity to Standards
- » CE-conforming soundproof safety protection included



**Maximum no. of drums which can be fitted together is:**

Drum code 48-	Standards	Max. quantity
D5242/EN	EN 1097-1	4
	NF P18-572	
	UNE 83115	
	CNR N° 109	
D5242/E2	EN 13450	2
	NF P18-572	
D5242/ASTM	ASTM D6928	4
	ASTM D7428	

**Stainless steel spheres (EN, ASTM and NF)**

**48-D0524/7**  
EN stainless steel spheres, 10 mm dia. Pack of 20 kg.

**48-D0524/9**  
ASTM stainless steel spheres, 9.5 mm dia. Pack of 20 kg.

**48-D0524/1**  
NF Steel spheres, 30 mm dia. Pack of 10 pcs.

**48-D0524/2**  
NF Steel spheres, 18 mm dia. Pack of 50 pcs.

## Determination of resistance to wear - Nordic test

**STANDARD**  
▶ EN 1097-9

### NORDIC MICRO-DEVAL TESTING MACHINE

This machine is practically identical to the Micro-Deval series 48-D5242/Ax but matches requirements of EN 1097-9 Resistance to wear by abrasion from studded tires – Nordic Test. It is supplied without cylinders and steel spheres available separately (maximum 2 cylinders code 48-D5242/EN3).

#### Ordering information

##### 48-D5242/NT

Micro-Deval testing machine to EN 1097-9, table mounting (steel base available as option). Complete with: CE-conforming soundproof safety cover. Drums and steel spheres are not included and have to be ordered separately. See accessories. 230 V, 50-60 Hz, 1 ph.

##### 48-D5242/NTZ

Same as above but 110 V, 60 Hz, 1 ph.

#### Accessories

##### Base

##### 48-D5242/A1

Steel base for Micro-Deval series 48-D5242/Ax and 48-D5242/NTx

##### Spare drum

##### 48-D5242/EN3

Stainless steel cylinder to EN 1097-9 for Nordic Micro-Deval series 48-D5242/NTx. Internal dia. 206.5 mm x 355 mm internal height and 3 ribs 333 mm length

##### Stainless steel spheres

##### 48-D0524/10

Steel spheres 15 mm dia. to EN 1097-9. Pack of 7 kg

**STANDARD** ▶ NF P18-577

### 48-D0523/G

#### DEVAL ABRASION TEST MACHINE

Used for testing the abrasion resistance of aggregates. The machine consists of a rotating frame to support two steel cylinders complete with covers and locking device. The rotating frame is driven by a motor speed reducer and an automatic counter is included to preset the required number of revolutions.

230 V, 50 Hz, 1 ph.

-Overall dimensions (l x d x h): 1500 x 500 x 700 mm

-Weight: 190 kg (approx.)



48-D0523/G

## Determination of the polished stone value (PSV)

**STANDARD**

▶ EN 1341 ▶ EN 1342 ▶ EN 1097-8  
▶ EN 1343

### ACCELERATED POLISHING MACHINE (PSV)

The Polished Stone Value (PSV) of a material used as road surfacing is a measure of how rapidly it becomes polished under the action of vehicle tires. This machine is used to produce accelerated polishing, conforming to Standards, of stone chippings set onto the periphery of a special revolving wheel. After the cycle, involving two grades of emery powder, the polished specimens are tested on the skid tester (see page 158) which gives the PSV, Polished Stone Value. The machine is supplied complete with road wheel, side plate, rubber rings, two tired wheels, drive belt, abrasive feed mechanism, corn emery, flour emery, specimen mould and mould plate.

#### MAIN FEATURES

- » Fully conforming to EN 1097-8
- » Advanced digital interface for programming test steps and pauses
- » Aluminum wheel 406 mm dia.
- » Independent control of the two feeders microprocessor controlled
- » Digital control of speed from 315 to 325 rpm
- » Full protection of all the moving part area with safety switch
- » Removable water tank, easy refill
- » Overall dimensions (hwxwd): 1800 x 980 x 510 mm
- » Weight: 200 kg (approx.)

#### Ordering information

##### 48-PV5262

Accelerated polishing machine. 230 V, 50-60 Hz, 1 ph

##### 48-PV5264

as above but 110 V, 60 Hz, 1 ph

#### Accessories

##### 48-PV0525/12

Corn emery, 5 kg pack



48-PV5262

##### 48-PV0525/13

Flour emery, 5 kg pack

##### 48-PV0525/17

Friction tester reference stone (Criggion stone-ungraded), 20 kg bag

##### 48-PV0525/18

Polished Stone Volume (PSV) control stone, graded version (low percentage of waste material), 4 kg bag



## Skid resistance and friction tester (Skid Tester)

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### STANDARD

- ▶ ASTM E303 ▶ EN 1097-8 ▶ EN 1338 ▶ EN 1341 ▶ EN 1342
- ▶ EN 13036-4

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 U.K. Transport and Research Laboratory, 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-PV190/ASTM** conforming to ASTM E303 standard;

**48-PV190/EN** 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

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

**Note:** rubber sliders are not included and have to be ordered separately.

### Ordering information

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

### FEATURES and BENEFITS

- » 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/EN

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

### 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).

### 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/ASTM – 48-PV0190/EN complete set



Rubber sliders



48-PV0190/5

## Sample reduction

### STANDARD

#### ▶ 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.

### JAW LABORATORY CRUSHER

Used to crush aggregates, core samples and similar materials when a reduction in sample size is necessary. The crusher has a jaw opening of 100x60 mm and can produce from 100 to 400 kg of material per hour. The movement of the jaws can be adjusted from 2 to 18 mm. The crushed sample can be further reduced using the Hammer mill for laboratory.

The crusher is housed in a protection case conforming to CE requirement and supplied with a separate control panel.

This is one of the apparatus required to obtain particles that pass through 300 µm sieve, starting from aggregates over 5 mm, conforming to ASTM C289. See also Hammer Mill and Jar Mills in links to other products below.

- Overall dimensions: 885 x 390 x 1169 mm (w x d x h)
- Weight: 135 kg (approx.)



### Ordering information

#### 48-D0530/A

Laboratory crusher for aggregate with separate control panel. 230V, 50Hz, 1 ph

#### 48-D0530/AZ

as above but 110V, 60 Hz, 1ph

### JAR MILL

Designed for milling aggregate samples to reduce particle sizes down from 1-5 mm to pass through a 300 µm approx sieve (depending on hardness of the material).

The machine is fitted within a noise reduction cabinet with a safety switch for safe operation conforming to CE directives and with a 0-99 minutes electronic timer.

- Overall dimensions: 730 x 350 x 445mm
- Weight approx.: 55 kg



### Ordering information

#### 48-D0544/A

Jar mill for crushing aggregate samples. Jar 1.5 l with grinding load included. 230V, 50Hz, 1ph

#### 48-D0544/AY

As above but 220V,60Hz,1 ph

#### 48-D0544/AZ

As above but 110V,60Hz,1 ph

### HAMMER MILL

The hammer mill is used to reduce the sample size, previously crushed to 5 mm size with the Laboratory Crusher, in order to perform various tests as, for instance, the chemical properties of aggregates. After entering the grinding chamber through the hopper, the material reaches the required fineness down to 1 mm and through the filtering hoses arrives to the collector. The machine is supplied complete with screens of 3, 2 and 1 mm opening. The material passing to the 1 mm screen is practically reduced to powder.



### Ordering information

#### 48-D0535/A

Hammer mill for laboratory. 380 V, 50 Hz, 3 ph

#### 48-D0535/AZ

as above but 220 V, 60 Hz, 3 ph

### Accessories

#### 48-D0535/A1

Screen 4 mm opening

### Spare parts

#### 48-D0535/A3

Screen, 1 mm opening

#### 48-D0535/A4

Screen, 2 mm opening

#### 48-D0535/A5

Screen, 3 mm opening

## Abrasion resistance of natural stones and concrete tiles for external paving

**STANDARD**

- ▶ 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. 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 con-

verted, 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.

**48-D0471/M**

Calibration Boulonnaise marble, 115 x 115 x 50 mm.

**Spare parts**

**48-D0471/1**

Abrasive white corundum sand 80 grade. 25 kg pack.

## Abrasion resistance of natural stones used for flooring in buildings

**(Böhme Method)**

**STANDARD**

- ▶ 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**

- 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**

Böhme 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.



Detail of 48-D5272



48-D0471



48-D5272

## Aggregate impact value: BS and NF method

**STANDARD**

► BS 812:112 ► NF P18-574



48-D0515/A

**48-D0515/A**

**IMPACT TESTING MACHINE**

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.)

## Determination of the aggregate crushing value: BS method

**STANDARD**

► BS 812:110

**AGGREGATE CRUSHING VALUE APPARATUS (ACV)**

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

**STANDARD**

► EN 13055

**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**

**STANDARD**

► EN 1097-6

**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

**STANDARD**

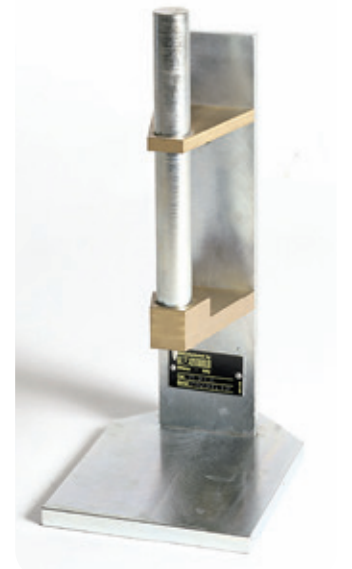
► ASTM C235

**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  $8.9 \pm 4$  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

### STANDARD

▶ 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 liter capacity. Weight: 1.4 kg (approx.)

#### 48-D0446/5

Bulk density measure, 5 liter capacity. Weight: 4.9 kg (approx.)

#### 48-D0446/10

Bulk density measure, 10 liter capacity. Weight: 7.4 kg (approx.)

#### 48-D0446/20

Bulk density measure, 20 liter capacity. - Weight: 11.9 kg (approx.)

### Accessories

#### 34-T0099

Straight edge.

#### 22-T0040/1

Glass plate 300 x 300 mm.

## Determination of the voids of dry compacted filler

### STANDARD

▶ 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

### STANDARD

▶ 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/C

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

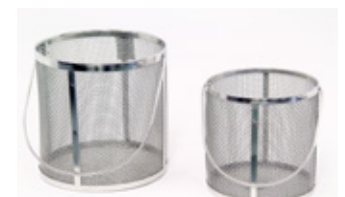
Density basket, stainless steel, 250 mm diameter x 250 mm height, 3.36 mm mesh size. Suitable for up to 15 kg of aggregates.

#### 11-D0630/30

Electronic top loading balance, 30 kg capacity, 0.5 g resolution.



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



11-D0612/1, 11-D0612



48-D0446/1, 48-D0446/5, 48-D0446/10, 48-D0446/20  
Stainless steel construction.

**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, conforming to EN 1097-6.

**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/A**

Glass jar supplied complete with cone and rubber seal, conforming to BS 812:2

- Capacity: 1 kg

- Weight approx.: 500 g



48-D0441/A

**48-D0440**

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**

**STANDARD**

► 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.

**Surface moisture of fine aggregates: ASTM method**

**STANDARD**

► 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-D0442



48-D0460



48-D0440

## 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 recalibrated 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.)

#### FEATURES and BENEFITS

- » 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

### STANDARD

- ▶ EN 1367-1 ▶ EN 196-1
- ▶ EN 12390-2

### TAC

#### TEMPERATURE AND HUMIDITY CONTROLLED CLIMATIC CABINETS

Three versions of this advanced thermal chamber are available:

##### 10-D1429/B

Temperature controlled from -30 to 70°C, for testing aggregates conforming to EN 1367-1 and other similar tests on concrete and other construction materials;

##### 10-D1429/C

Temperature and relative humidity controlled respectively from -30 to 70°C and from 20 to ≥90% humidity, for aggregates and various other tests as for instance concrete and cement specimens curing (EN 196-1).

##### 10-D1429/D

Temperature and relative humidity controlled respectively from -30 to 70°C and from 20 to ≥95% humidity, for aggregates and various other tests as for instance concrete and cement specimen curing (EN 196-1).

For the determination of resistance to freezing and thawing of aggregates the accessory 48-D0457, should be used. See accessories.

For a detailed description, see page 7.

#### Ordering information

##### 10-D1429/B

Temperature controlled cabinet, 500 l cap., temperature range -30 to 70°C. 230 V, 50 Hz, 1 ph.

##### 10-D1429/BY

As above but 220 V, 60 Hz, 1 ph.

##### 10-D1429/BZ

As above but 110 V, 60 Hz, 1 ph.



#### FEATURES and BENEFITS

- » Advanced controller with cycle programmer for 100 programs each one up to 64 segments
- » Up to 2 (one included, one additional) temperature sensors movable inside the cabinet or inside the sample, according to the norms
- » Temperature, humidity and time recording, as per Standards requirement
- » High accuracy: ±1°C, ±5%RH (RH with 10-D1429/C and 10-D1429/D models only)
- » A multipurpose climatic chamber suitable for Aggregates, Cement, Concrete, Bricks, Blocks, Asphalt and other construction materials
- » Intuitive interface with 7" large easy-to-use colour touchscreen display

48

## Magnesium sulphate test

### STANDARD

- ▶ EN 1367-2 ▶ BS812:121

Also comparable to:  
ASTM C88 ▶ UNE 7136

- ▶ 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 BASKETS, 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.)

##### 48-D0612/12

Stainless steel mesh basket, 95 mm diameter x 120 mm high, 1.18 mm openings.  
Weight: 0.3 kg (approx.)

##### 48-D0612/13

Stainless steel mesh basket, 95 mm diameter x 120 mm high, 0.600 mm openings.  
Weight: 0.3 kg (approx.)

##### 48-D0612/14

Stainless steel mesh basket, 65 mm diameter x 80 mm high, 0.150 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 1.000 to 1.500 g/ml, accuracy 0.001 g/ml  
Weight: 0.1 kg (approx.)

##### 10-D1429/C

Temperature and humidity controlled cabinet, 500 l cap., temperature range -30 to 70°C, humidity range from 20 to ≥90%. 230 V, 50 Hz, 1 ph.

##### 10-D1429/CY

As above but 220 V, 60 Hz, 1 ph.

##### 10-D1429/CZ

As above but 110 V, 60 Hz, 1 ph.

##### 10-D1429/D

Temperature and humidity controlled cabinet, 500 l cap., temperature range -30 to 70°C, humidity range from 20 to ≥95%. 230 V, 50 Hz, 1 ph.

##### 10-D1429/DY

As above but 220 V, 60 Hz, 1 ph.

##### 10-D1429/DZ

As above but 110 V, 60 Hz, 1 ph.

#### Accessories

##### 10-D1429/1

Additional PT 100 sensor.

##### 48-D0457

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





## Soundness of aggregates by use of sodium sulphate or magnesium sulphate

**STANDARD**

▶ 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/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/A5**

Stainless steel mesh basket, 600 µm opening (No. 30 ASTM), 120 mm diameter, 160 mm high. Weight: 0.3 kg (approx.)

**48-D0452**

Hydrometer range 1000 to 1500 g/ml, accuracy 0.001 g/ml, weight 0.1 kg (approx.).



48-D0612/A3, 48-D0612/A2

## Determination of drying shrinkage

**STANDARD**

▶ 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.)

**Note:** for more information see page 270

**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 270

**82-D1261/LINK**

Serial cable for PC connection.

**62-L0034/3**

Reference rod, 205 mm length.



48-D0453

## Determination of resistance to thermal shock

**STANDARD**

▶ 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 thermo-regulator 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.
- 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**

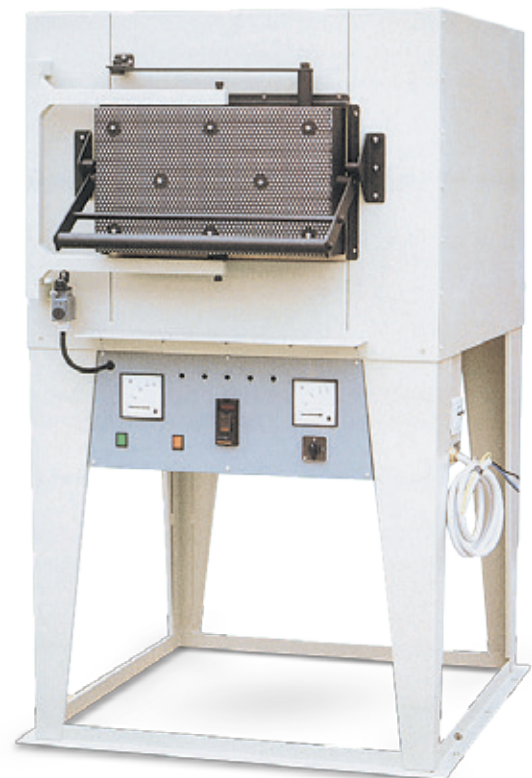
Metal support frame for metal test plate.

**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

### STANDARD

- ASTM C289\*
- NF P94-048 ► UNI 8520-22

\*Chemical method

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 153), constant temperature water bath (see 76-B0066/A page 343), 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.

**Note:** for more information see page 271

### 48-D0545

#### REACTION CONTAINER

Made from stainless steel and fitted with an airtight cover.

Capacity: 59 cm<sup>3</sup> 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 length 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 ...

##### 82-D1261/LINK

Serial cable for PC connection.

##### 62-L0034/11

Reference rod. Gauge length 294 mm.

#### Spare parts

##### 62-L0009/A1

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

#### 48-D0850/A COLOR STANDARD GLASS SCALE

### STANDARD

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

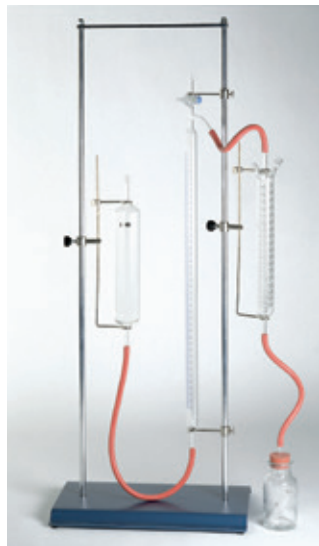
## Carbonate content of aggregates

### 48-D0570

#### DIETRICH-FRÜHLING GASOMETER

This apparatus is used for the determination of CaCO<sub>3</sub>, 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<sub>2</sub>) given off, the quantity of CaCO<sub>3</sub> contained in the sample can be calculated.

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



48-D0570



62-L0009/A

## Organic impurities in fine aggregates

### STANDARD

- 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, 48-D1091

## Chloride content of fine aggregates

### STANDARD

- 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, range 0.005% to 0.1% NaCl. Pack of 40 strips.

##### 48-D0543/A

Quantab chloride titrator, range 0.05% to 1% NaCl. Pack of 40 strips.