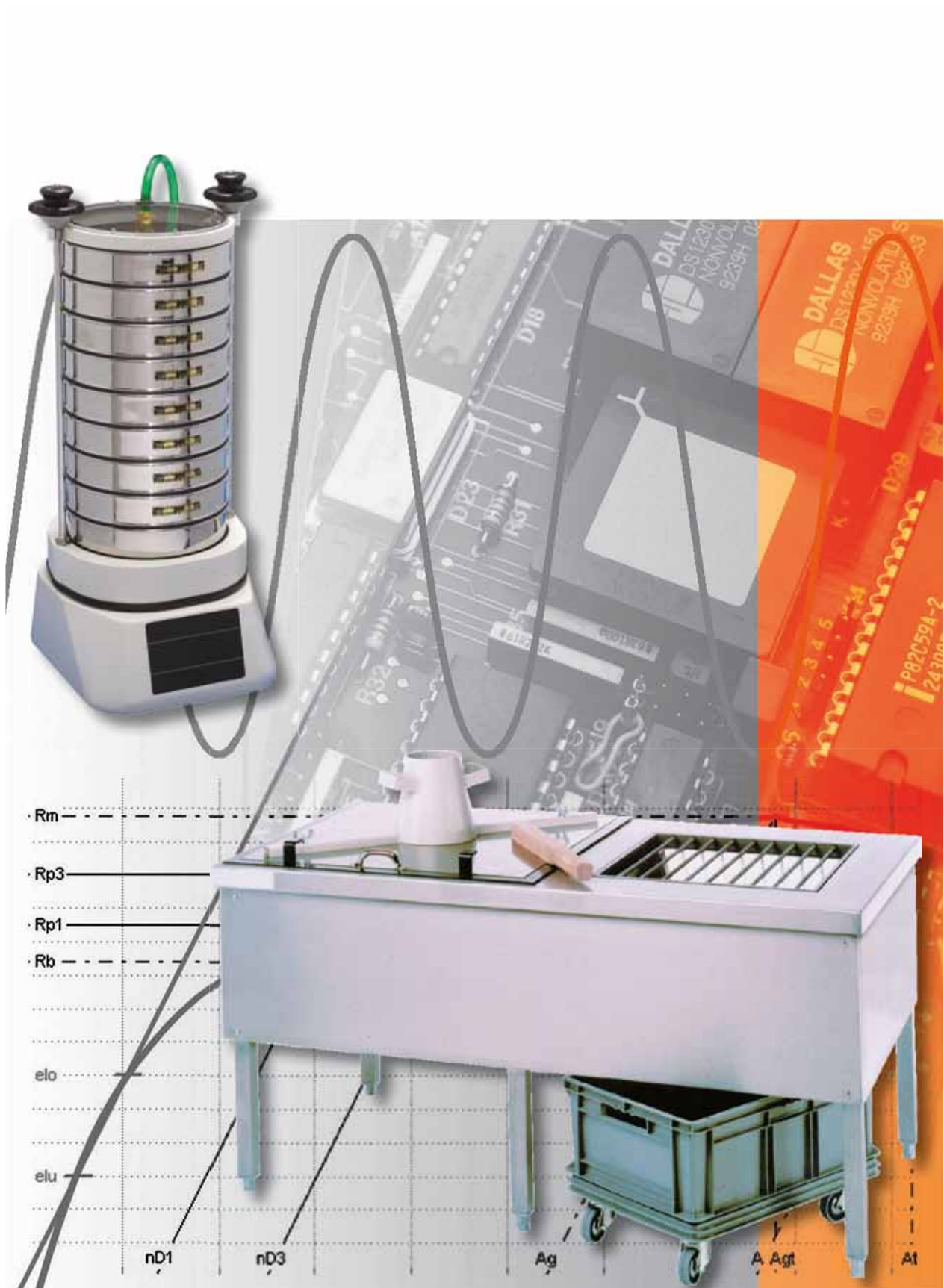


Soil, Aggregates and Laboratory Testing Equipment



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Soil, Aggregates and Laboratory Testing Equipment

in accordance with relevant Standards

Soil

For the construction of civil engineering structures, the soil properties are analysed to determine the basis for the calculations of the construction.

This section shows some of the equipment needed for studies and analyses of soil properties including sampling, preparation, classification, consolidation, shear strength, triaxial, compaction, penetration, bearing capacity, permeability, density, chemical tests a.s.o. The testing equipment conforms with international relevant standards as EN, ASTM and the corresponding national standards.

Aggregates

Aggregates is a broad category of coarse particulate material used in construction, including sand, gravel, crushed stone, slag, recycled concrete and geosynthetic aggregates. Aggregates are a component of composite materials such as concrete and asphalt concrete; the aggregate serves as reinforcement to add strength to the overall composite material.

The international standards require different test for the determination of mechanical, physical, geometrical, density, strength, degradability characteristics. In this section you find a broad range of testing equipment conforming with the standards.

Construction Repair

This section shows some equipment for nondestructive tests for the determination and evaluation of the progressive ageing and durability of concrete structures which face air pollution, chemical attacks and time effects.

General Laboratory Equipment

This section includes some general laboratory equipment and accessories used for general purposes and to perform different measurements as temperature, humidity, density, weight a.s.o.

Laboratory Installations

We are able to offer complete laboratory installations for physical testing. In this section you find a range of systemic installations and solutions for specimen storing and curing.

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Soil Testing Equipment

CBR / Marshall Compression Testing Machines Series CBR 50 - 100 kN



asphalt core samples, CBR moulds a.s.o. Please refer to page 122.

Specially designed for CBR and Marshall tests according to relevant international standards. Compact testing machine with integrated hydraulic power pack in the base of the machine. Fully automatic test procedure in closed loop mode. Various different testing devices are available including Marshall stability mould, split tension device for Marshall specimen, shearing device for

Proctor Moulds EN 13286 - 2, ASTM D558, D698, D1557 a.s.o.



to the various international Standards in use.

The moulds are specially designed for the proctor test for the determination of the moisture-density relationship. The proctor moulds are used for determining the relationship between the moisture content and density of compacted soils. Steel made, complete with mould body, collar and base; plated against corrosion. Different proctor mould models are available according

CBR Moulds EN 13286-47, EN 13286-4, ASTM D1883 a.s.o.



performed both with the manual rammers and the automatic compactor.

This test method has been developed by the California State Highway Department and is now accepted by almost all the International Standards effective. The test is aimed to the evaluation of the bearing capacity of soil for flexible pavement design in road construction. The CBR equipment is available in different versions according to the various Standards in force. The compaction test can be

Compaction Rammers for Proctor and CBR Moulds



compactor can be used.

The rammers are used to compact the soil sample into the mould. The spherical hand knob is from bakelite with metal screw and protection ring nut; guide sleeve with vent holes. The rammers are steel made, plated against corrosion, available in different models according to the various International Standards in use. In alternative to the rammers the automatic com-

Other Equipment Upon Request!

Triaxial Tests according to ASTM D2850, D4767 and others



anchored walls, bearing allowable load capacity for shallow foundations.

The application of local loads or pressures on soils determine the deformation, the settlement and the yield of the same. To determine the relationship between these loads and the consequent deformations, in order to establish the soil shear strength. The triaxial tests are made to evaluate: excavation works, design of bridges, earth dams, trestle bridges, slope stability, piled foundation works,

F25601 Universal Hand-Operated Extruder for Proctor, CBR & Marshall Samples



500 mm and the weight is 30 kg.

The universal extruder is used to extrude samples having diameters of 4", 6", 100 mm or 150 mm. It can therefore extrude CBR, Marshall and Proctor specimens. The extruder is actuated by a 50 kN hydraulic jack with a ram travel of 190 mm + 170 mm screw. The extruder is supplied complete with adapters. Dimensions of the device is diameter 300 x height

F4500 Vibrating Compaction Hammer according to EN 13286 - 4



tampers, 300 mm shank and support frame.

This device provides an alternative method for the compaction of soil samples in the determination of dry density/moisture content relation (called Proctor), unconfined compressive strength of stabilized soils and CBR tests. This hammer is also used for the compaction of asphalt in the percentage refusal density. The hammer is supplied with CBR and Proctor

F4300 Automatic CBR / Proctor Compactor according to EN 13286 - 4



with turntable rotation and rammer displacement.

Designed to compact Proctor and CBR specimens, it ensures an extremely uniform compaction degree, granting reliable and repeatable test results. The software allows to perform different compaction cycles in a fully automatic system, by strictly meeting the mentioned International Standards. The blows are automatically distributed as requested by the selected Standard,

Soil Testing Equipment

Other Equipment Upon Request!

F2755 Sand Equivalent Test Set according to EN 933 - 8

This test is meant to serve as a rapid field to show the relevant proportions of clay-like or plastic fines and dusts in granular soils and fine aggregates. The set comprises 5 measuring cylinders graduated at 100 and 380 mm, 2 rubber stoppers, rule 500 mm, funnel, measuring can 200 ml, plastic bottle 5 litres, irrigator tube, foot assembly for sand level, sieve dia. 200 mm, concentrated stock solution, digital stop watch, clamp stand set, portable carrying case.



F27651 Motorized Sand Equivalent Shaker according to EN 933 - 8

The testing unit provides a constant uniform shaking with automatic cycle test. Oscillating excursion is 203 mm at a rate of 175 - 180 adjustable strokes/min. The unit comes complete with digital timer that automatically stops the shaker at the end of the test. Optional with security cabinet for CE conformity. Power supply: 230 V, 50 Hz. Dimensions 700 x 360 x 350 mm. Weight 30 kg.



F2727 Liquid Limit CASAGRANDE Method according to EN ASTM D4318

Used to evaluate the relationship between the moisture percentage of a soil sample and the number of blows required to close a groove made into the soil; and therefore to determine when a clay soil changes from a plastic to a liquid state. The unit comprises a removable brass cup which through a cam device drops on a bakelite base (or hard rubber base). Optional available is a motorized version for better accuracy and uniformity.



F2950 Constant Head Permeameter according to ASTM D2434

Used to determine the permeability of granular, gravel and sand soils. The specimen is formed in an acrylic permeability cell, and water is passed through it from a constant level tank. The permeability cell has pressure points at different levels which are connected to the manometer tubes fixed on a stand with graduated scale. Two constant head permeability cells are available: 75 mm and 114 mm diameter.



F30200 Oedometer for Consolidation Test according to ASTM D2435

The one-dimensional consolidation test of a soil sample enables to ascertain the settlement characteristic over a given period of time. The soil specimen is axially loaded and laterally contained. Loads are applied with progressive increases and the settlement values are read on a dial gauge or digital display. The beam of the front-loading oedometer provides three loading ratio 9:1, 10:1, 11:1 and the beam assembly is fitted with an adjustable counterbalance weight.



F30600 Direct / Residual Shear Tester according to ASTM D3080

Used to determine the resistance to shearing of all types of soil specimens both consolidated and drained, undisturbed or remoulded samples. For specimens dia. 50, 60, 100 mm and square 60 x 60, 100 x 100 mm. The device is equipped with a closed loop controlled motor. It allows a different return speed (residual shear) in relation to the one used for the shear test, thus allowing a quick playback to select the residual shear test, saving a lot of time.



F55000 Dynamic Drop Weight Tester according to TP BF-StB Part B

Used in earthwork and road construction to determine the soil bearing capacity and the compaction quality of soils and non-cohesive subbases, as well as for soil improvement applications. The test method is suited for coarse-grain and mixed-grain soil having maximum grain size of 63 mm. The test method may be used to determine the dynamic modulus of deformation on soil in the range.



F2670 Plate Bearing Test Device acc. to ASTM D1194, D1195, D1196

This test is performed for the determination of the bearing capacity of a soil in-situ on road constructions, foundations, road subgrades, airport and highway pavements. A wide range of plate bearing test equipment are available, together with many accessories according to the different Standards and specific enduser needs. Available with capacities of 100, 200 or 500 kN, with dial gauges or displacement transducers and optional data acquisition.



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Aggregates Testing Equipment

Stainless Steel Test Sieves according to EN, ISO, DIN, ASTM and others



Sieves are made with stainless steel woven wire and frame and meet International Specifications. Available sieves:

- Mesh Sizes: 20 µm - 125.0 mm
- Square Perforation: 4.0 - 125 mm
- Diameters: 76.2 - 400 mm

The sieve aperture is clearly marked on the metallic label, comprising the serial number for the identification and traceability of the sieve. Each sieve is

supplied complete with certificate of conformity.

Motorized Test Sieve Shakers Series EML



These test sieve shakers are used to separate dry or wet sieveable products into single fractions. Reproducible test sieve results can be achieved in the shortest possible time. Hand sieving, which is the basis of the total separation technique, can be accurately replicated. These models produce a three-dimensional sieving action. The material is distributed over

the whole sieving surface. Optional with noise reduction cabinet.

N1990 Sieve Shaker High Capacity



This high capacity sieve shaker is designed for sieving considerable quantities of any material. The screen shaker accepts up to 30 litres or about 60 - 70 kg of sample material. Sturdy made, the machine can hold six screen trays and dust pan. Supplied complete with dust pan, but without screen trays to be ordered separately. Optional with noise reduction cabinet steel made. If

the door is opened while the shaker is working, it automatically stops.

Ultrasonic Action Test Sieve Cleaner for Diameters 230 mm or 500 mm



This sieve cleaners are used for a safe and valid cleaning of sieves which could be damaged by ordinary cleaning methods, it is particularly suitable for fine mesh sieves. For test sieves up to an outer diameter of 230 mm or 500 mm. Splash-proof, hard-chrome plated stainless steel oscillation tank, stainless steel case with outlet R ¼". The cleaner come with time switch 0 - 15

minutes or with continuous operation.

Other Equipment Upon Request!

Grid Sieves 300 x 300 mm for Aggregates Flakiness Index and Particle Shape



The frame of these grid sieves is anodized aluminium made and the grids are from stainless steel rod bars having diameter from 5 to 15 mm according to the slot widths. Sieve sizes, slot width tolerances and rod bars diameter are checked one by one and meet the requirement of the EN 933-3 Standard. Each sieve is supplied complete with identification serial number

label. The weight of each grid sieve is 4 kg.

N0560 ALPINE AIR JET Sieve Machine according to EN 933 - 10



The Air Jet Sieves is well known for extremely accurate and reproducible particle size sieve analysis in the particle size range from 20 micron up to 4 mm. It is complete with an integral calculator and processor which converts sieve residue in grams from an external balance into a percentage and can be supplied with software to transmit information to remote data logging devices. Optional with integrated weigh scale.

Optional with integrated weigh scale.

Sample Splitters (Riffle Boxes) according to EN 933 - 3, ASTM C136 and others



The sample splitters are used for the precise division into two representative portions of materials such as aggregates, sand, gravel and similar. The divider consists of a number of alternatively arranged partitions, with the material collected in alternate receivers. Consisting of one rack, one divider and three receivers made from galvanized steel. Available with 6 dividers 75 mm, 8 dividers 50 mm, 12 dividers 37.5 mm or 16 dividers 25 mm.

8 dividers 50 mm, 12 dividers 37.5 mm or 16 dividers 25 mm.

N2000 LOS ANGELES Abrasion Machine according to EN 1097-2 & ASTM C131



Used to determine the resistance of aggregates to abrasion in accordance with EN 1097-2, EN 12697-17, EN 12697-43, ASTM C131 a.s.o. It comprises a heavy steel cylinder of 711 mm inside diameter x 508 mm inside length, mounted on a base frame. The cylinder rotates at 31-33 rpm. With automatic digital counter to set the required number of revolutions of the drum. Abrasives charges

in accordance to the standards. Optional with noise reduction cabinet.

Aggregates Testing Equipment

N2100 MICRO-DEVAL Testing Machine according to EN 1097 - 1

The machine is used to determine the resistance of aggregates by abrasion or also know as the resistance to wear. The machine essentially comprises a heavy steel frame on which four stainless steel cylinders with diameters 200 x 154 mm are mounted. The machine comes with a separate control panel with a digital automatic revolutions counter. Available are different sizes of cylinders and spheres according to the standards. Optional with noise reduction cabinet.



N2200 Aggregate Impact Value Apparatus according to BS 812 and NF P18-574

The device is used to determine the impact value of aggregates and select them for a given application. The machine has a trip-action hammer release, blow counter device and a built-in operator safety device. Manufactured in heavy duty form with hardened steel surfaces for minimum wear. The complete assembly is cadmium plated for corrosion protection. Available with cylindrical moulds according to the relevant standard.



N1012 Skid Resistance Tester according to EN 1097 - 8, ASTM E303

To perform two types of tests: For measuring pavement (road asphalt) surface frictional and skid resistance properties and for polished stone value tests on aggregates (curved specimens) from accelerated polishing tests. Also suitable to perform tests on natural stones conforming to EN 1341, 1342 and concrete block pavers conforming to EN 1338. The tester measures the energy loss when a rubber slider edge is propelled over the surface under test.



Heating Chambers with Forced Convection Series FED

Especially suitable where high temperature uniformity and precision inside the chamber are required. The accuracy of the temperature and its uniformity are granted within the tolerances requested by the Standards. Temperature from room temperature up to 300°C is controlled by a digital precision thermoregulator-indicator. The oven is supplied complete with two grid shelves easily removable and that can be positioned at various heights.



Other Equipment Upon Request!

N0710 Laboratory Jaws Crusher according to UNE 83120

The machine is designed to crush any sort of material, also the hardest. The structure is from cast iron, the shaft from rectified steel, the jaws from manganese. Jaws opening is regulated from 2 to 15 mm by a wedge. Jaw size: 100 x 60 mm. Production 100 to 400 kg / hour. The crusher is suitable to prepare the material to be reduced to powder with the jar mill. Complete with steel cabinet for CE conformity and collecting pan.



N2700 Insertion Moisture Meter MICROLANCE

For measurements in sand, aggregates, building materials, minerals and mixes. Electronic unit to measure and visualize the moisture and temperature with direct reading (instant spot reading or average) on the display of the moisture and temperature. This hand held moisture meter is suitable for quick, convenient on site moisture measurement from small batches to hundreds of tons or for laboratory use where no sample preparation, chemicals a.s.o. is required.



N2600 Abrasimeter according to EN 154, EN ISO 10545-7

The abrasimeter is used to determine the abrasion resistance of glazed tiles and other materials in accordance with EN 154, EN ISO 10545-7 and other international relevant standards. The instrument has three stations and it can work either with wet (PEI) or dry (MCC) abrasive charges. The eccentricity is 22.5 mm and the revolutions per minute are 300. The machine is supplied complete with safety cabinet for CE conformity.



L0550 Heated Sand Bath for Beakers Flasks

This very versatile sand bath is used for the homogeneous heating or evaporation of the content of beakers flasks and others samples. The inside dimensions are 300 x 240 x 90 mm with a volume of 7 litres. The weight is 17 kg. The required power supply is 230 V, 50 Hz.



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Construction Repair Test Devices

B1470 Test Magnet Set MAURO BAU



This test magnet set is especially designed for the quick evaluation and re-investigation of concrete covers. The test set includes 4 test magnets for a measuring range of 25 or 28 mm, a transport case and the instruction manual with reference tables.

T08196 Carbide Meter for Surface Dampness



For the rapid and accurate determination of moisture content. The sample is drilled or scraped from the surface and introduced into the bottle with the carbide reagent. The meter is suitable for moisture tests on sand, aggregates, soil etc. It is possible to vary the sample weight from 3 to 100 g for the complete reaction between sample and carbide with accurate moisture measurements from 0 to over the 20%.

B1407 Rebar Locator PROFOMETER 5+ according to DIN 1045, BS 1881:204



The testing device is especially designed for locating reinforcing bars. The testing device uses the non-destructive pulse-indication method. The rebar detection system incorporates the following functions: location and orientation of reinforcing bars with insufficient concrete cover, measuring of concrete cover depth in congested bar arrangements, determination of bar diameter of closely spaced parallel bars.

B3570 Digital Corrosion Meter according to ASTM C876



The digital half-cell enables rapid location of corroding reinforcement without disrupting the concrete cover. The unit is a hand set with an integral (removable) Ag/AgCl/Sat. KC1 mapping electrode for maintenance free long term stability and the instrument automatically converts and displays the measurements as Cu/CuSO₄ equivalent potentials. The unit is battery powered giving typically 1000 hours use with low battery indicator.

B14010 Concrete Test Hammer SCHMIDT according to EN 12504, ASTM C805



Designed to perform non-destructive tests on concrete structures, it gives an immediate indication of the compressive strength of the concrete using the calibration curve. The spring impact energy is 0.225 mkg. (2.207 Joule or Nm). Suitable for finished concrete structures and buildings having strength resistances from 10 to 70 N/mm². Supplied complete with calibration

curve chart in N/mm² (Mpa) values and abrasive stone.

B14200 Resonance Frequency Meter according to ASTM C212



For the determination of the resonant frequency of concrete. The unit measures the resonant frequencies of the three different modes of vibration: Longitudinal, transverse (flexural) and torsional. From these, the following material characteristics, non destructively, can be calculated: young's modulus of elasticity, modulus of rigidity, and poisson's ratio. Automatic

identification of the resonance frequency.

B14110 Ultrasonic Tester PUNDIT LAB according to EN 12504, ASTM C597



Along with the traditional transit time and pulse velocity measurement, the device offers path length measurement, perpendicular crack depth measurement and surface velocity measurement. The ultrasonic tester features online data acquisition, waveform analysis and full remote control of all transmission parameters. Optimized pulse shaping gives greater transmission

range at lower voltage levels.

T0290 Crack Detection Microscope for Concrete Structures



This crack detection microscope is used to measure crack width in concrete structures, by operating via an adjustable light source. High definition unit, provided by power batteries, carrying case. The eyepiece scale can be turned through 360° to align with the direction of the crack under detection. Measuring range is 4 mm and divisions of 0.02 mm. The magnification:

of the microscope is x35. The weight is 600 g.

Laboratory Equipment

Electronic Precision Balances

Designed for laboratory general purposes. Sturdy and precise, they are fitted with strain gauge cells and large backlit display. Immediate and automatic zeroing and tare, automatic changeover of scale sensitivity. With RS232 interface for PC or printer connection.



Thermometers

Available in various executions with different temperature ranges and accuracy. Available are digital thermometers, humidity and temperature measuring devices, automatic temperature and humidity recorders, moisture meters and more.



General Laboratory Equipment

- Measuring Cylinder
- Tray
- Wash Bottle
- Glass Beaker
- Funnel
- Calliper
- Measuring Beaker
- Bucket
- Shovels
- Brush Instruments
- Measuring Tape
- Membrane Vacuum Pump
- Plastic Bags
- Water Distillation Apparatus
- a.s.o



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Complete Laboratories for Physical Building Materials Testing

Serving the concrete, cement and building materials industry since more than 40 years, w+b benefits from a wide experience in producing building materials testing machines and equipment.

Due to our ability in engineering we also can offer complete installations for physical testing laboratories all over the world. To meet the wide variety of testing needs w+b offers a complete range of laboratory equipment.



Components of Systemic Laboratory Installations



Laboratory Table with Drawers



Laboratory Table with Drawers / Doors



Laboratory Table with Roller Conveyer



Standard Table



Table with Balance



Table with Grid



Vibrating Table



Laboratory Table with Water Basin



Laboratory Table for SLUMP Test



Laboratory Table for DARR Test

Specimen Storing according to Relevant International Standards



F60120 Wet Storing Basin



F65000 Humidity Storing Cabinet



F65181 Humidity Storing Cabinet

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