HACK THE MAT

laboratory made in Personal Factory

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INSTRUMENTATION

NAME	DESCRIPTION
Blaine Apparatus	For determining the fineness of Portland cement, in terms of specific surface area expressed as total area in cm²/g of cement. Complete with cell, disc, and accessories (thermometer, 1,000 filter discs, 100 cc of manometric liquid, silicone grease, funnel, and brush).
Cement Calorimeter	Consists of a Dewar flask housed in a highly thermally insulated container, a constant-speed stirrer, a Beckman thermometer, and a funnel for introducing the cement. The Dewar flask is easily removable from the wooden container.
5-liter mortar mixer	Mortar preparation instrument in accordance with EN 196-1. All-stainless-steel construction with two planetary speeds of 62 and 125 rpm (clockwise). Paddle speeds: 140 and 285 rpm (counterclockwise). 5-liter stainless steel mixing bowl equipped with quick-connect fittings to the mixer. Fully polished stainless steel paddle. Dual safety system in accordance with EC directives: both on the mixing bowl lowering mechanism and on the upper protective guard.
Homogenizer	Used to homogenize and emulsify solutions up to a capacity of 7 L. Equipped with two paddles, 28 mm and 36 mm in diameter. Rotation speed range from 300 rpm to 18,000 rpm.
Electromagnetic Sieve Shaker	Operates using electromagnetic pulses. Controlled by a separate microprocessor unit capable of timing the sieving process from 0 to 999 minutes, adjusting vibration intensity, and selecting continuous or intermittent sieving modes with adjustable settings. The actual vibration is generated by combining three different types of motion (vertical, lateral, and rotational).
Molds	To prepare the samples for the specified test, follow these procedures: Weigh the required amount of water using a balance (EN 196-1); mix the dry mortar mixture using a mixer (EN 196-1) for the time and at the speed specified in the reference standard; place the mixture into the mold with the dimensions specified in the reference standard; and smooth the surface with a trowel or spatula.
Vibrating table	Two-part frame, consisting of a fixed and a swinging section, made of steel with a quick-release mold locking mechanism and a protective guard. Drop height of 15 mm with a frequency of 60 drops per minute. Control unit with a 3-digit selector for programming cycles and automatic shutdown at the end of the test.
pH indicator	--

INSTRUMENTATIO

NAME	DESCRIPTION
Microanalysis	A system capable of examining the structure of analyzed samples and determining the composition of the elements they contain. Element detection range: C–Am. It allows for multiple point-by-point analysis with a resolution of up to 1 million counts, identifying the elements present at each point. For each image captured via SEM, up to 12 points can be defined, and the composition of each point is determined using a spectrum. The accelerating voltage ranges from 5 kV to 10 kV. This capability can be enhanced with the mapping function, which detects the distribution of elements by area rather than by point. The elements detected during microanalysis can be mapped at the resolution (456×456 pixels, 684×684 pixels, 1024×1024 pixels, 2048×2048 pixels) and within the acquisition time set by the user. A maximum of 10 elements can be mapped per examined area.
Morphologi	The system measures the size and shape of dry powders, wet suspended particles, and particles on filter membranes using automated static image analysis. Equipped with four lenses (2.5x, 5x, 10x, 20x, and 50x), it is capable of examining particles ranging in size from 0.5 µm to 1000 µm. The measured parameters include diameter, length, width, perimeter, area, shape, transparency, and particle position. Statistical representativeness: it analyzes hundreds of thousands of particles. No operator error: the Standard Operating Procedure (SOP) ensures that all instrument variables (focus, light intensity, magnification) are objectively recorded and controlled. When combined with a Raman spectrometer, the system is capable of performing accurate chemical analysis.
RAMAN	Raman spectroscopy is a non-invasive and non-destructive technique based on radiation interaction. Specifically, radiation emitted by a laser beam interacts with the rotational and vibrational motions of molecules, resulting in the re-emission of light at wavelengths different from that of the incident light. The resulting spectrum, known as the Raman spectrum, thus provides a “fingerprint” of the molecule under examination, allowing for its identification. Due to its characteristics, it is considered complementary to infrared spectroscopy; in fact, the Raman spectrum, like the infrared spectrum, is a vibrational spectrum, but it differs from the latter for two fundamental reasons: first, the Raman spectrum is generated by the difference between two electronic energy levels (whose difference corresponds to a vibrational level), whereas the IR spectrum is generated by the selective absorption of radiation that causes energy transitions; second, Raman and IR spectra differ in their transition selection rules, which determine which vibrational modes are active and which are not: in IR, energies that cause changes in a molecule’s dipole moment are absorbed, whereas in Raman, a change in its polarizability is required—a property linked to the ability of the electron cloud to become distorted. This means that the bands generally have different intensities, and in some cases, bands may be present in one technique but not in the other, and vice versa. For example, Raman signals related to metal-ligand bonds in inorganic substances are generally in the 100–700 cm^{-1} range, which corresponds to a spectral region that is difficult to resolve in IR but detectable in the Raman spectrum. Another characteristic of the Raman technique compared to IR is that water is practically Raman-transparent, and therefore aqueous samples can be analyzed. Since glass also exhibits weak Raman absorption, it is possible to analyze aqueous samples in simple test tubes. The Raman spectroscopy-based instrument in the Personal Factory laboratory is capable of automatically identifying individual particles using established spectroscopic algorithms incorporated into the Morphologi software. This allows for the analysis of a specific class of particles or a specific component in a mixture. Spectrometric resolution range: 150 cm^{-1} to 1850 cm^{-1}, with a resolution of 4 cm^{-1}. Equipped with a laser having a wavelength of 785 nm, a spot diameter of 3 µm, and 50x magnification.

NAME	DESCRIPTION
SEM	A Scanning Electron Microscope (SEM) is a high-resolution microscope equipped with an X-ray analysis system. The instrument analyzes X-rays generated by bombarding the sample under examination with a beam of electrons. It is capable of observing non-metallized materials. Sample dimensions: 25 mm in diameter and 30 mm in height. Sample loading in less than 30 seconds. Magnification range: 20–100,000x. Image resolution: 456×456 pixels, 684×684 pixels, 1024×1024 pixels, 2048×2048 pixels. Four possible image quality settings (response speed/noise): Live, Medium, High, Best. Four possible image acquisition speeds: Basic, Medium, High, Best. Images can be downloaded in 3 formats: TIFF, JPEG, BMP.
Vicat needle	A 3-axis Cartesian robot driven by stepper motors capable of positioning the needle at any point within the test area; a fourth servomotor moves a gripper that releases the penetration assembly when opened and retrieves it when closed. The gripper's function can be disabled to allow the needle to descend with zero acceleration. The penetration depth is measured during the sample retrieval phase and is reported in tenths of a millimeter. After each penetration, the needle is guided through the cleaning brushes and held there until the next operation. Once the cycle is complete, the machine stops automatically and saves the measurement file. A dedicated container is provided for the sample's thermostatic bath, capable of maintaining the water temperature between 10°C and 40°C.
Marsh Cone	To evaluate the flowability of a mortar sample by measuring the time it takes to flow out of the orifice of a standardized cone. 2-liter plastic container. Sieve with a diameter of 150 mm and a mesh size of 1.5 mm. Stainless steel cones with diameters of 10 and 152 mm—inclination 28° - height: 280 mm. Base and stand. The cone comes with 4 interchangeable stainless steel orifices, with diameters of 8, 9, 10, and 11 mm. Dimensions: 220x260x620 mm. Weight: 7 kg
Bending Drain Test	The Schleibinger Bending Test Rig is used to measure the shrinkage and bending of building materials. Additionally, it can simulate real-world conditions using an electrically heated floor heating system. High-precision measurements are guaranteed by two static pillars and a solid steel U-shaped base. A sheet of neoprene between the test fixture and the material prevents friction and material jamming, even when using expansive materials. The test fixture is statically independent of the mortar beam, which is supported at two well-defined points.
Thin-Layer Shrinkage Tester (TMLS)	In building materials applied in thin layers, shrinkage is one of the main problems for two reasons: the high surface-to-volume ratio and the intense hydration reactions. To study the contraction/expansion mechanisms during the plastic phase in thin layers of fast-setting mortar, the TLMS was developed, consisting of two laser units. The material is placed in a thin, flexible mold with a large surface area and low volume. The two lasers are directed horizontally at a pair of lightweight reflectors, which are positioned on top of the fresh mortar. The change in distance between the reflectors is then recorded with a precision of 0.1 microns. The total change in length is given by the sum of the two distances. The non-contact laser device allows measurements to begin immediately after the fresh mortar is placed. A data logger supplied with the system records and stores the data. The instrument has a network interface (Ethernet). Using a standard web browser, the data can be read and displayed. It is also possible to evaluate the warping typical of self-leveling floors when the two lasers are directed vertically at a pair of reflectors placed on top of the fresh mortar at two opposite corners.

NAME	DESCRIPTION
Volumetric Shrinkage Meter	The Shrinkage Cone can be used to measure the plastic shrinkage of construction materials. The basic configuration of the Shrinkage Cone equipment consists of a laser unit mounted on a stand and a cylindrical container with a conical interior. In addition, the manufacturer provides cone-shaped protective sheets that minimize friction, as well as reflectors. Data is recorded in a data logger that can be connected to and controlled via a computer.
Linear variation meter	Precision instrument for measuring linear variations. Micrometer-adjustable support, thousandth-of-a-millimeter dial indicator with a 5 mm travel range, and 2 stainless steel probes.
Concrete Compression Test Press	Hydraulic press with a capacity of 2,000 kN. Pressure is detected by a strain gauge transducer, and the equipment displays the reading in terms of load. At the end of the test, the motor stops automatically, and the equipment displays the test result. Measurement range from 200 kN to 2,000 kN. Reading range from 0 kN to 2,000 kN. Suitable for evaluating the compressive strength of cubic specimens with side lengths of 100 mm, 150 mm, and 200 mm, and of cylindrical specimens measuring 100 mm × 200 mm, 150 mm × 300 mm, and 160 mm × 320 mm.
Compression testing machine for adhesives	The machine is equipped with a dynamometer for measuring and displaying the load. The system includes a high-precision load cell with a capacity of 5 kg (sensitivity 1 g). A transmission release device allows for rapid return and positioning of the slider. Deformation is measured using a centesimal dial gauge with a 30 mm travel. The equipment naturally includes the power supply and control unit, as well as the specimen support with its associated rollers.
Compression testing machine for concrete	For flexural testing of concrete beams measuring 100 mm × 100 mm × 400/500 mm and 150 mm × 150 mm × 600/750 mm. Equipped with a strain gauge load cell. It consists of a pair of support blades (one fixed and one oscillating/rotating) whose distance is adjustable up to a maximum of 450 mm; a pair of oscillating/rotating upper blades mounted on an oscillating system, with the ability to adjust their distance up to a maximum of 150 mm. One of the upper knives can be easily removed to allow for tests with a central load.
Cement testing press	Automatic hydraulic press with capacities of 300 kN and 20 kN. The structure features a single chamber equipped with two coaxial load cells rated at 20 kN and 300 kN, respectively; the lower-capacity load cell is protected against overloads by an automatic deformation stop; the scale change occurs automatically and seamlessly. Load plates with a diameter of 166 mm and a thickness of 30 mm are supplied as standard, positioned at a vertical distance of 320 mm. It is equipped with an oil-bath ball joint, which is designed to settle effortlessly and then lock as the load increases. With the use of appropriate fixtures, it can perform compression tests (compressor for 40 mm × 40 mm sections, compressor for 50 mm diameter sections), flexural tests (fixture for flexural testing of 40 mm × 40 mm × 160 mm specimens, equipped with two lower supports spaced 100 mm apart and an upper oscillating blade), tests to determine the elastic modulus, adhesion tests (adhesion test accessory for verifying the tear resistance of construction adhesives), shear tests (shear test accessory for verifying the shear resistance of construction adhesives), and tensile tests (tensile test device).

NAME	DESCRIPTION
Pull-off	It consists of a built-in, remote-controlled motor that allows for automatic measurement under a constant load. Tensile force is applied by turning the crank. The digital display shows the applied load in real time. The instrument is equipped with an internal memory capable of storing the entire pull-off measurement. It allows for the application of a tensile force in the range of 1.6 kN to 16 kN.
Sagging Tester	The BGD 225 Tester for determining product sagging is manufactured in accordance with the specifications of ASTM D 4400 and ASTM D 373. It is constructed of corrosion-resistant stainless steel; the application width is 75 millimeters with a thickness of 6 mm at the trailing edge; the gaps are separated by a 1-mm space, with a mark on each sag for distinct identification.
Leveling Tester	The BGD 226 Leveling Tester is designed to determine the relative leveling of liquid coating materials prior to laboratory testing. It complies with ASTM D2801-1994. It is made of stainless steel with a straight scraper equipped with 5 pairs of notches of increasing depth ranging from 100 to 1,000 µm (or 250 to 4,000 µm).
Viscosimeter	Instrument designed to determine the viscosity of products based on the rotational principle. Capable of measuring viscosities in the range of 10–6,000,000 MPa·s, with an adjustable speed from 0.1 to 100 rpm. It is equipped with four different rotors suitable for evaluating the viscosity of fluids of varying viscosity. Direct reading of all parameters on the display.
Flow cup viscometer	There are two types of viscosity cups: Ford cups and DIN cups. This method is used to determine the flow time of paints, varnishes, and related products, which can be used to check their consistency. Standard viscosity cups are manufactured with an easily removable orifice. The cup design and manufacturing tolerance of the orifice allow for easy replacement without loss of tolerance—or at least with an acceptable level of tolerance. In accordance with the German Standard DIN 53211, there are flow cups of similar dimensions but with different orifice diameters.
3-station waterproofing tester	The test is performed by placing the sample in the designated chamber (250 x 250 x 220 mm, height-adjustable) and securing it between the upper flange and the lower sealing gasket that defines the test area. Pressurized water is then introduced into the 100-mm-diameter test area for a specified period of time. A high-precision valve controls the pressure displayed on the pressure gauge. The unit can accommodate 3 test specimens simultaneously. All parts in contact with water are made of stainless steel. The inlet and outlet valves are located on the front of the machine, and the top panel features 3 graduated burettes for measuring water volume.
Climate-controlled cabinet	Internal and external structure entirely made of stainless steel. Thermal insulation with self-extinguishing polyurethane foam. Front service door with magnetic seal. Cooling via a hermetic unit with air condensation. Heating via an electric heating element with low thermal inertia, protected by a maximum temperature thermostat. Dehumidification via direct expansion of cryogenic gas. Humidification via a water vapor generator. Internal forced-circulation ventilation. It has a temperature range from -20° to +60°C and a humidity range of 10–90% RH ±5%, with a dew point limit of +2°C.
Thermostatic bath	Low-temperature thermostatic bath.

NAME	DESCRIPTION
UV chamber	The instrument consists of a chamber containing three UV fluorescent lamps. The system is equipped with a water spray system inside the chamber. The temperature, spray duration, and irradiation duration can be controlled to replicate the natural conditions to which the sample is subjected. The chamber has a capacity of 24 samples, each measuring 150 mm × 70 mm. The temperature range is from 30°C to 100°C. The spray duration range is from 1 min to 999 min. The total test duration range is from 1 h to 9.999 h.
Salt Spray Chamber	The internal and external structure is made entirely of FRP (fiber-reinforced plastics) with good corrosion resistance. It consists of an inner chamber in which the test specimens are placed. The interior of the chamber houses two towers for spraying the salt spray. On the exterior, it is equipped with a control panel that displays the temperature inside the chamber and the temperature of the saturated solution required to produce the salt spray. The temperature range varies from 5°C to 50°C. The salt spray deposition rate ranges from 1 to 2 ml/80 cm²·h. The instrument allows for the setup of cyclic tests.
Chamber for aging	
Muffle furnace	Consists of an internal chamber measuring 200 mm × 120 mm × 80 mm with a capacity of 2 L. The interior lining of the door and the inner chamber is made of stainless steel to resist corrosion and deformation caused by high temperatures. The oven is capable of reaching a maximum temperature of 1,200°C.
Convection Oven	The oven's interior structure is made of stainless steel, measuring 600 mm x 500 mm x 750 mm, with a capacity of 220 L. It features an internal fan to ensure uniform temperature distribution within the chamber. It is equipped with an external control panel for setting the temperature and operating time. It features an alarm system. The temperature range varies from 10°C to 300°C.
Immersion tank	
Wet scrub resistance	Instrument suitable for conducting abrasion resistance tests caused by brushes sliding across the surface of the test specimen. The wet abrasion tester reproduces a repeatable and controlled condition to simulate daily wear. It can also be used to determine the effectiveness of detergents. It consists of two holders, within which the samples are secured for side-by-side testing. A metering pump is connected directly to the brushes mounted on the holders. A preset digital counter starts and stops the instrument for a predetermined number of cycles. The cleaning liquids are pumped to the brush heads from a removable container located on the side of the instrument. The pump can be turned on or off during the test. The instrument complies with the EN ISO 11998 standard.

NAME	DESCRIPTION
Taber abrasion tester	A device capable of evaluating the resistance to abrasion by rubbing of two wheels coated with sandpaper. It consists of a base capable of holding a flat, circular specimen with a diameter of 100 mm that rotates on a vertical axis at a fixed speed. It is equipped with two abrasive wheels capable of making a complete circle on the surface of the specimen, thereby revealing its resistance to abrasion. The wheels are pressed against the sample surface with a specific pressure determined by a selected load (500 g, 750 g, 1,000 g). The instrument has two disc rotation speeds: 60±2 g/min and 72±2 g/min. On the side of the instrument is a port to which a vacuum system is connected to extract the dust generated by the rollers rubbing against the sample.
Pencil hardness tester	This portable instrument is suitable for performing sclerometric hardness tests even on samples with curved surfaces. It is essentially a pen equipped with a BOSH-compliant carbide tip having a diameter of 0.75 mm and three springs to apply load to the tip, with the following ranges: 0 to 3 N, 0 to 10 N, and 0 to 20 N.
Adjustable hardness tester Pen-type	Hardness testing device in accordance with ISO 15184. It consists of a calibrated pencil holder and a set of 12 pencils with hardness ranging from 4B to 6H. The angle between the pencil positioned in the holder and the surface to be tested is 45°. The pencil can be pressed against the surface with a weight of 500 g, 750 g, or 1,000 g.
Paint Coverage Chart	
Automatic Scratch Tester	This instrument evaluates the hardness of a material by creating a scratch on the test specimen using a tip. The tip material (tungsten carbide) is guided across the surface under a constant load. The load that can be applied ranges from 50 g to 2,500 g. At a certain critical load, the surface becomes marked; at another, it begins to fracture; and at a third, it fails completely. The critical loads are detected by an acoustic and light sensor. The instrument is equipped with a voltmeter. Failure of the coating is indicated by a sudden movement of the voltmeter's pointer. Complies with ISO 1518.
Impact Resistance Tester Impact Resistance Tester	Instrument for evaluating the impact resistance of a sample subjected to the impact of a falling hammer. Consists of a vertical element equipped with a graduated scale and mounted on a solid base. This element acts as a guide for an impact weight of a predetermined mass (300 g, 500 g, 1,000 g). The drop height is adjustable (from 50 to 500 mm). By using the locking mechanism along the vertical element, it is possible to produce the same impact force for each test.
Color observation chamber	The chamber is designed for observing the color of a sample placed on a shelf inclined at 45° under specific lighting conditions. The instrument is equipped with an exposure chamber within which users can choose from six types of light. Each light simulates a specific condition. An LCD screen displays the type of light in the chamber and the duration of illumination.
Colorimeter	The instrument allows for rapid analysis of color and chromatic differences between the sample and the tested surface. Equipped with a display. Inspection modes based on lighting type: 8/d (8° diffuse reflection), SCE (eliminates reflected light). Inspection angle 10° (CIE operating angle). Illuminated area 8 mm. Displayed parameters: L*a*b*; L*c*h* chromatic values; ΔE*ab, Δ(L*a*b*), Δ(L*C*h*) differential values

NAME	DESCRIPTION
Photographic system	SLR camera with a 20.2-megapixel full-frame (1.0x) sensor. The ISO sensitivity range, including extended settings, is 50–102,400, and it can shoot in burst mode at 4.5 FPS. 36 x 24 mm CMOS image sensor. DIGIC 5+ image processor. Shutter speeds: 30" – 1/4000. Exposure compensation: ±5 stops in 1/3-stop increments. Exposure modes: P, S, A, M, scene modes. TTL-CT-SIR autofocus with dedicated CMOS sensor. AF system/points: 11 points (1 central cross-type point up to f/5.61, sensitivity greater than f/2.8). AF operating range: EV -3 to -18 (at 23°C and ISO 100). Tamron 90 mm lens with 1:1 macro capability, 27° angle of view, 55 mm filter diameter, and a minimum focusing distance of 0.29 m.
Spectrophotometer	It is a portable instrument with spherical geometry and horizontal alignment, capable of simultaneously displaying measurements in SCI (Specular Component Included) and SCE (Specular Component Excluded) on the screen. The information is displayed both graphically and numerically. D:8° illumination and observation system (diffuse illumination and 8° observation angle). Complies with ISO 7724/1 standards. Sphere diameter 53 mm. Wavelength range from 360 nm to 740 nm. Wavelength step: 10 nm. Light source consisting of 2 pulsed xenon lamps. Measurement and illumination areas: 8 mm and 11 mm. Colorimetric data: L*a*b*, L*C*h, CMC (1:1), CMC (2:1), CIE94, Yxy, XYZ, MI, ΔE*ab, CIE DE2000 WI (ASTM E313), YI (ASTM E313/ASTM D1925).
ROSETTA 2	It is a semi-automatic laboratory assistant. Designed for two operators, it consists of a laboratory table integrated with two touchscreen PCs, two barcode readers, two small-capacity balances with a maximum reading capacity of up to 20 g, two medium-capacity balances with a maximum reading capacity of up to 4,000 g, one large-capacity balance with a maximum capacity of 110 kg, and two TCP/IP web servers. Rosetta is connected to the Cloud LAB platform and guides operators through formulation processes; it allows formulas to be duplicated, helps operators calculate formulation-related costs, and records every experiment performed and its results fully automatically. The procedure to be followed for the correct use of ROSETTA consists of the following steps: chemical formulation of the product, to which a barcode is assigned; weighing and recording of all components in the formulation; preparation of the mixture; preparation of samples; evaluation of the samples through appropriate laboratory tests; recording of the results obtained; modification of the chemical formulation based on the results obtained or those to be achieved; and repetition of the previous steps until the desired result is achieved for the product.
iNephos	iNephos is a cloud-based platform, created and designed in-house, that enables full traceability of production carried out using ORIGAMI systems, as well as the management of costs, prices, and budgets, and inventory management. All information and data related to your production facility are recorded in your secure area on the cloud platform. You can easily access this platform via a web browser by visiting the website and entering your login credentials. The platform—and your data—are protected by an SSL encryption protocol.

REGULATIONS

STANDARDS

METHOD	FEATURES	REGULATIONS
EN 12192-1	Particle size distribution of dry components	UNI EN 1504-3
EN 13295	Carbonation resistance	UNI EN 1504-3
EN 13395-1	Workability - thixotropic mortar	UNI EN 1504-3
EN 13395-2	Workability - mortar spreadability	UNI EN 1504-3
EN 13395-3	Workability - concrete placement	UNI EN 1504-3
EN 1542	Bond Strength	UNI EN 1504-3
EN 12617-4	Shrinkage and Expansion	UNI EN 1504-3
EN 12190 § 7.2	Compressive strength	UNI EN 1504-3
EN 12190 § 7.1	Density	UNI EN 1504-3
EN 13057	Capillary Absorption	UNI EN 1504-3
EN 13412	Elastic modulus	UNI EN 1504-3
EN 1015-17	Chloride ion content	UNI EN 1504-3
EN 13687-1	Freeze-thaw thermal compatibility	UNI EN 1504-3
EN 13687-2	Thermal compatibility during thunderstorms	UNI EN 1504-3
EN 13687-4	Thermal compatibility—dry cycles	UNI EN 1504-3
EN 13036-4	Slip resistance	UNI EN 1504-3
EN 1770	Coefficient of thermal expansion	UNI EN 1504-3
EN 13294	Setting time	UNI EN 1504-3
EN 1767	Infrared spectrophotometric analysis	UNI EN 1504-3
EN ISO 11358	Thermogravimetric analysis	UNI EN 1504-3
EN 1877-1	Epoxy equivalent	UNI EN 1504-3
EN 1877-2	Amine function	UNI EN 1504-3
EN ISO 9514	Pot life	UNI EN 1504-3
EN ISO 3251	Volatile and non-volatile substances	UNI EN 1504-3
EN 1015-10	Bulk density	UNI EN 998-1
EN 1015-11 p. 9	Compressive strength	UNI EN 998-1

NOMENCLATURE

- Repair Mortars and Plasters
- Grout
- Waterproofing
- Adhesives
- Screeds

NOMENCLATURE

Repair Mortars and Plasters

Grout

Waterproofing

Adhesives

Screeds

METHOD	CHARACTERISTIC	REGULATIONS
EN 1015-11 p. 8	Flexural Strength	UNI EN 998-1
EN 1015-12	Adhesion to the substrate	UNI EN 998-1
EN 1015-21 § 7.2	Adhesion after cycles of weathering exposure	UNI EN 998-1
EN 1015-18	Capillary water absorption	UNI EN 998-1
EN 1015-21 § 7.1	Water permeability on relevant substrates after freeze-thaw cycles	UNI EN 998-1
EN 1015-19	Water vapor permeability coefficient	UNI EN 998-1
EN 1745	Thermal Conductivity	UNI EN 998-1
EN 13501-1	Fire resistance	UNI EN 998-1
EN 1348 § 8.2	Initial tensile adhesion	UNI EN 12004
EN 1348 § 8.3	Tensile adhesion after immersion in water	UNI EN 12004
EN 1348 § 8.4	Tensile adhesion after thermal aging	UNI EN 12004
EN 1348 § 8.5	Tensile adhesion after freeze-thaw cycles	UNI EN 12004
EN 1346	Open time: tensile adhesion	UNI EN 12004
EN 1308	Slip	UNI EN 12004
EN 12002	Transverse deformation	UNI EN 12004
EN 12808-2	Abrasion resistance	UNI EN 13888
EN 12808-3 § 7.3	Flexural strength under standard conditions	UNI EN 13888
EN 12808-3 § 7.4	Compressive strength under standard conditions	UNI EN 13888
EN 12808-3 § 7.5	Flexural and compressive strength after freeze-thaw cycles	UNI EN 13888
EN 12808-4	Determination of shrinkage	UNI EN 13888
EN 12808-5	Determination of water absorption	UNI EN 13888
EN ISO 2811-1	Density: pycnometer method	UNI EN 1504-2
EN ISO 2811-2	Density: immersed body method	UNI EN 1504-2
EN 13294	Setting time	UNI EN 1504-2
EN 13395-2	Workability – Spreading of the mortar	UNI EN 1504-2
EN 1015-7	Air content	UNI EN 1504-2

NOMENCLATURE

- Repair Mortars and Plasters
- Grout
- Waterproofing
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- Screeds

STANDARDS

METHOD	CHARACTERISTIC	REGULATIONS
EN 1015-3	Consistency	UNI EN 1504-2
EN 1015-6	Density	UNI EN 1504-2
EN 1767	Infrared spectrum	UNI EN 1504-2
EN 1877-1	Epoxy equivalent	UNI EN 1504-2
EN 1877-2	Amine functions	UNI EN 1504-2
EN 1242	Hydroxyl value	UNI EN 1504-2
EN ISO 3251	Volatile and non-volatile substances	UNI EN 1504-2
EN ISO 3451-1	Ash content	UNI EN 1504-2
EN ISO 11358	Thermogravimetry	UNI EN 1504-2
EN ISO 2431	Flow time	UNI EN 1504-2
EN ISO 3219	Viscosity	UNI EN 1504-2
EN 12192-1	Particle size distribution of dry components	UNI EN 1504-2
EN ISO 9514	Shelf Life	UNI EN 1504-2
EN ISO 868	Curing Progression	UNI EN 1504-2
EN 12617-1	Linear shrinkage	UNI ENV 1504-9
EN 12190	Compressive strength	UNI ENV 1504-9
EN 1770	Coefficient of thermal expansion	UNI ENV 1504-9
EN ISO 5470-1	Abrasion resistance	UNI ENV 1504-9
EN ISO 2409	Adhesion after oblique cut tests	UNI ENV 1504-9
EN 1062-6	Carbon dioxide permeability	UNI ENV 1504-9
EN ISO 7783-1	Water vapor permeability	UNI ENV 1504-9
EN 1062-3	Capillary absorption and water permeability	UNI ENV 1504-9
EN 13687-1	Freeze-thaw cycles with immersion in de-icing salts	UNI ENV 1504-9
EN 13687-2	Storm cycles—thermal shock	UNI ENV 1504-9
EN 13687-3	Thermal cycles without immersion in de-icing salts	UNI ENV 1504-9
EN 1062-11 § 4.1	Aging	UNI ENV 1504-9
EN 13687-5	Thermal shock resistance	UNI ENV 1504-9
EN ISO 2812-1	Chemical resistance	UNI ENV 1504-9
EN 13529	Resistance to severe chemical attack	UNI ENV 1504-9
EN 1062-7	Crack resistance	UNI ENV 1504-9

NOMENCLATURE

Repair Mortars and Plasters | Grout | Waterproofing | Adhesives | Screeds

METHOD	CHARACTERISTIC	REGULATIONS
EN ISO 6272-1	Impact resistance	UNI ENV 1504-9
EN 1542	Adhesion strength by direct pull test	UNI ENV 1504-9
EN 13501-1	Fire classification of construction products and building elements containing more than 1% organic matter	UNI ENV 1504-9
EN 13581	Resistance to mass loss of hydrophobic-impregnated concrete after freeze-thaw cycles in the presence of salt	UNI ENV 1504-9
EN 13036-4	Slip resistance	UNI ENV 1504-9
EN 1062-11 § 4.2	Performance after exposure to artificial weathering agents	UNI ENV 1504-9
EN 1081	Antistatic performance	UNI ENV 1504-9
EN 13578	Adhesion to wet concrete	UNI ENV 1504-9
EN 13580	Water absorption and alkali resistance test for hydrophobic impregnation	UNI ENV 1504-9
EN 13579	Drying rate for hydrophobic impregnation	UNI ENV 1504-9
EN 14891 § A.6.2	Initial adhesion	UNI EN 14891
EN 14891 § A.6.3	Adhesion after immersion in water	UNI EN 14891
EN 14891 § A.6.5	Adhesion after heat exposure	UNI EN 14891
EN 14891 § A.6.6	Adhesion after freeze-thaw cycles	UNI EN 14891
EN 14891 § A.6.9	Adhesion after immersion in lime water	UNI EN 14891
EN 14891 § A.6.7 EN 1489 § A.6.8	Adhesion after immersion in chlorinated water	UNI EN 14891
EN 14891 § A.8.2	Crack-bridging ability under standard conditions (+20°C)	UNI EN 14891
EN 14891 § A.8.3	Crack-bridging ability at low temperatures (-5°C)	UNI EN 14891
EN 13892-2 § 6.2	Compressive strength	UNI EN 13813
EN 13892-2 § 6.3	Flexural strength	UNI EN 13813
EN 13892-3	Böhme wear resistance	UNI EN 13813
EN 13892-4	Böhme wear resistance BCA	UNI EN 13813

NOMENCLATURE

- Repair Mortars and Plasters
- Grout
- Waterproofing
- Adhesives
- Screeds

STANDARDS

METHOD	CHARACTERISTIC	REGULATIONS
EN 13892-5	Resistance to wear caused by rotating loads	UNI EN 13813
EN 13892-6	Surface hardness	UNI EN 13813
EN 12697-20	Resistance to residual indentation on cubes	UNI EN 13813
EN 12697-21	Resistance to residual indentation on slabs	UNI EN 13813
EN 13892-7	Resistance to rotating loads	UNI EN 13813
EN 13454-2	Setting time	UNI EN 13813
EN ISO 178	Modulus of elasticity in bending	UNI EN 13813
EN 13892-8	Adhesion	UNI EN 13813
EN 1081	Electrical resistance	UNI EN 13813
EN 13529	Chemical resistance	UNI EN 13813
EN 13501-1	Fire resistance	UNI EN 13813
EN 12086	Water Vapor Permeability	UNI EN 13813
EN 12664	Thermal resistance	UNI EN 13813
EN 1062-3	Water permeability	UNI EN 13813
EN ISO 140-6	Impact sound insulation	UNI EN 13813
EN 12354-6	Sound absorption	UNI EN 13813

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