

*walter+bai*

# Building Materials Testing Systems



*w+b*

*walter+bai*

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# walter+bai ag Testing Machines



walter+bai ag Testing Machines supplies a wide range of material testing machines and systems for the safety and quality of materials, industrial products and buildings.

Mechanical testing is carried out in many industrial sectors, such as the automotive and aircraft industry, metal industry, plastic and rubber industry, the chemical industry, construction industry, bio mechanics as well as institutes and universities. Serving these industries for more than 40 years, w+b benefits from the company's extensive experience in producing material testing systems and equipment to meet this wide range of applications. Due to our considerable engineering capabilities we are able to offer not only standard testing machines but also customized solutions or complete installations for physical testing laboratories world-wide. To ensure you obtain the maximum rewards from your investment, our accredited calibration laboratory guarantees that excellent after-sale service and verification facilities are available for your installation.

## Profile

We are renowned for the production of high quality systems. Due to our continuous research and development policy as well as

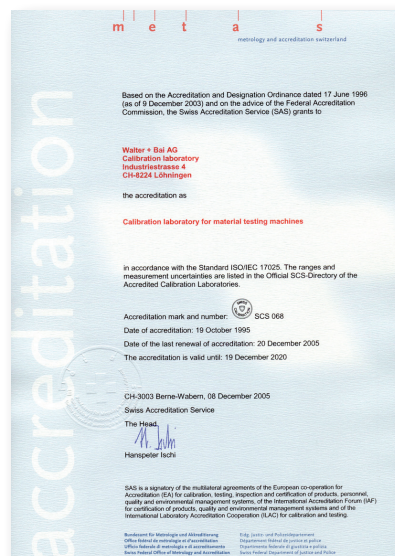
actively collaborating with our customers and suppliers we have always maintained the very high product standard ever since the company was founded in 1970 by Armin Walter and Alfred Bai in Löhningen - Switzerland. The sales, design and manufacturing divisions associated with testing machines has grown due to the constant interaction with a multitude of clients and the systematic realisation of their requirements. Our product range has been steadily expanded and our service sector activities extended to meet growing demands. The unique position of w+b in the field of material testing machines can be attributed to the fact that their specialised know-how related

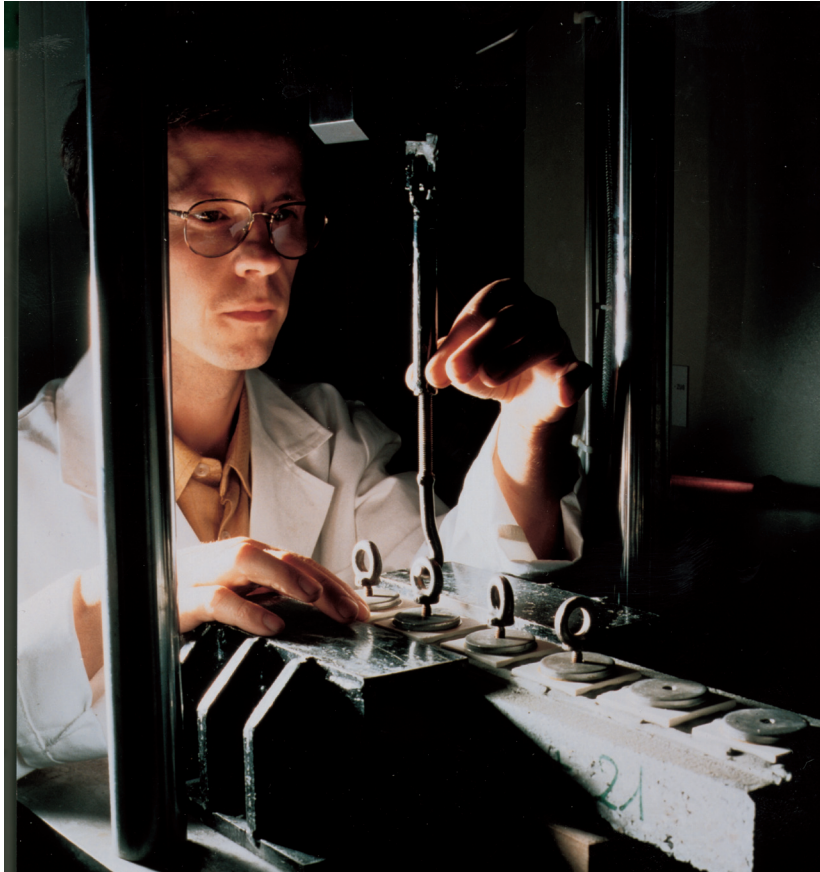
**w+b company building with manufacturing hall and office building in Löhningen, Switzerland.**

to materials testing is being constantly updated whilst offering custom designed products and services. A well qualified and highly motivated staff coupled with an efficient organisational structure forms the backbone of w+b upon which you can depend for know-how, competence and reliable performance. To pace with the great demand of high quality testing machines we increased 2008 our manufacturing facility and office space to 1300 m<sup>2</sup>.

w+b Calibration and ISO 9001:2000 Certificates can be downloaded on [www.walterbai.com](http://www.walterbai.com).

walter+bai Testing Machines





From product development and manufacturing, up to the final inspection, we are committed to highest quality standards. Therefore our products are characterised by minimal maintenance and trouble-free performance.

- Maintenance and calibration of material testing machines
- Project management and technical consultancy

**Accredited Calibration Laboratory according to ISO / IEC 17025**

Our accredited calibration laboratory allows a recognised calibration of testing machines according to international standards and to issue official calibration certificates.

**Quality Management System according to ISO 9001:2000**

Our certified business management system shows our commitment to quality also in processes and management.

**«Specific testing tasks demand appropriate testing equipment!»**

This is our motto. Therefore, besides our standard range of testing machines, we have developed a number of customized testing machines for static and dynamic material and component testing.

w+b Testing Machines are the pacemaker for trendsetting technologies. They are a prerequisite for the safety and quality of materials, industrial products and buildings.

**Our Products and Services**

- Manufacturing of materials testing machines and systems
- Customer specific testing systems
- Servohydraulic and electromechanical, static and dynamic testing machines
- Digital measuring and control systems and testing software
- Hydraulic power packs
- Static and dynamic single actuators testing systems
- Clamping arrays for component testing
- Testing machines for construction materials
- Modernisation of existing testing machines in a modular way

The inside of the newly added w+b manufacturing hall.



The design and developing department with our experienced and qualified staff.



**Concrete Testing**

**Basic Compression Testing Machines Series D5 1200 - 3000 kN**



Very basic stand-alone model with integrated hydraulic power pack in the lower part and digital controller in the upper part. The machine comes in a high stiffness 4-column construction with a single acting ram. The machine allows to test cubes up to 200 mm length and cylinders up to diameter 160 mm and height of 320 mm. With distance platens to adjust the test chamber height to different sample heights.

test chamber height to different sample heights.

**Low Cost Compression Testing Machines Series C 1500 - 3000 kN**



Very basic and low cost compression testing machine available as stand-alone machine with power pack placed on the side of the frame or for the connection to an existing testing system. The machine features a high stiffness 4-column construction with a single acting ram. Available as manual controlled machine with digital read-out DIGICON 1000 or in connection with servovalve and DIGICON 2000 for testing in closed loop mode.

servovalve and DIGICON 2000 for testing in closed loop mode.

**Compact Compression Testing Machines Series DC 2000 - 3000 kN**



The Series DC is a compact family of concrete compression testing machines. The frame is a high stiffness 4-column construction with single acting ram, lower fixed platen and upper spherically seated platen with oil filled ball seat assembly. The chassis contains in the lower part the integrated hydraulic power pack with servo-valve assembly and in the upper part the digital controller and strip printer.

part the digital controller and strip printer.

**Compression Testing Machines Series D 3000 - 6000 kN**



This rigid four-column load frame with single acting ram, lower fixed platen and upper spherically seated platen with oil filled ball seat. The columns are chromium plated and the piston is hardened and micro finished. The machine is precision aligned and cylinder test conform. These testing machines can be connected to the free standing 19" control console with low noise power pack or to the measuring and weighting system.

power pack or to the measuring and weighting system.

**High Strength Brittle Materials Testing Machine Series D - S 4000 kN**



Specially designed for high strength brittle materials with special strengthened upper platen assembly for durable testing in accordance with EN 772 - 1. Samples include concrete, masonry units, bricks, clay blocks, rocks a.s.o. Very high stiffness 4-column construction. The upper compression platen assembly is specially strengthened with bearings at the upper platen, bearings at the upper crosshead and absorbing elements with shock resistant springs.

upper crosshead and absorbing elements with shock resistant springs.

**Compression Testing Machines Series DV 1000 - 10 000 kN**



The Series DV models feature adjustable crosshead facility by two long stroke actuators and passive clamping system onto the hardened and chromium plated columns. It allows quick, easy and accurate positioning of upper crosshead specially useful when sample heights are often different. The load frames have superior axial and lateral stiffness and precision aligned

for advanced testing of building materials.

**Large Load Frames for High Capacity Testing up to 10 000 kN or higher**



As customer made testing machines, we supply compression testing machines for capacities up to 10 MN or higher. These load frames are always designed and manufactured according to customer's testing requirements. These custom designed testing machines feature increased testing space by means of daylight between the columns and test chamber height

for universal use on large samples.

**Creep Testing Machines Series HKB 100 - 1000 kN**



For creep tests on building materials by means of a pressure exerted load. Test can be carried out either on a single samples or on several samples in series. Test duration up to several years. Hydro pneumatic loading device is integrated in the base of the machine. The force is kept constant by a compressed gas storage system. The load cylinder is put under pressure by a hand or motor driven pump. Any number of machines can be driven by one pump.

Any number of machines can be driven by one pump.

Concrete Testing

**Universal Concrete Testing Machines**  
**Series DBZ - 2S 100 - 300 kN**

To determine the flexural strength of fibre reinforced concrete beams a.s.o. Series DBZ are rigid 2-column constructions and are equipped with double acting actuator for high responsive control on top with long piston stroke and precision flat load cell between piston rod and bending edge. Optional upper compression platen allow to use the wide range of different devices for additional testing on cement, asphalt or other building materials.



**Compact Combined Testing Machines**  
**Series DBC 2000 - 4000 kN / 100 - 300 kN**

This stand-alone compact testing machine is equipped with 2 testing chambers for bending and compression tests in one single machine. The hydraulic power pack is integrated in the lower and digital display in the upper part. The compression frame features a single acting ram and an upper spherically seated compression platen. The flexural frame has a double acting ram and precision flat load cell to reach grade 0.5.



**Energy Absorption Testing Machines**  
**Series DBZ - 4S 100 - 1000 kN**

These very universal concrete testing machines are especially configured for energy absorption tests in accordance with EN 10834 and EN 14488. The machine is equipped with compression stamp 100 x 100 mm and base frame 600 x 600 x 100 mm for energy absorption test. Ergonomic working height with excellent access to the testing chamber for efficient and easy testing. The machines can also be used for other tests including tensile tests.



**Combined Testing Machines**  
**Series DB 2000 - 4000 kN / 100 - 300 kN**

The Series DB are combined compression and bending testing machines are rigid four-column load frames. The lower compression plate is fixed platen and upper spherically seated with oil filled ball seat assembly. The columns are chromium plated and the piston is hardened and micro finished. The flexural test space uses double acting actuators, providing a quick controlling what also allows testing reinforced concrete.



**Electromechanical Bending Testing Machines**  
**Series DBZ - E 20 - 150 kN**

These bending testing machines have an electromechanically moveable upper crosshead with mechanical clamping and central electromechanical ballscrew actuator. Additional devices are available for the determination of the adhesive strength of mortar or other coatings on concrete and for testing of sprayed concrete specially for the determination of the energy absorption capacity of fibre reinforced slab specimens.



**Cement and Concrete Testing Machine**  
**Series DB - H 400 - 1000 kN / 10 - 20 kN**

These stand alone testing machines are especially designed for bending and compression tests on concrete and cement samples in one single machine. The hydraulic power pack with oil-air cooling system is integrated in the base of the machine, the digital controller with optional strip printer can be mounted on the side of the machine. Different devices can be inserted in the bending and compression chamber for universal use.



**Machine with Extra Wide Bending Table**  
**Series B - S 50 - 200 kN**

Very universal bending testing machines with bending table with 6 meter support length for testing of large concrete, timber and other specimens. Two swivelling supports with continuously adjustable facility. The machine can also be used for compression and tensile tests. The machine has a rigid c-shape construction and a double acting actuator with anti-rotation system to prevent the natural tendency to rotate.



**Gully and Manhole Top Testing Machines**  
**Series D - GT 500 - 1000 kN**

Specially designed for testing of gully and manhole tops for vehicular and pedestrian areas according to EN 124. Large load frame for convenient operation. High stiffness 4-column construction with double acting actuator with integrated displacement transducer and anti-rotation system. Differential pressure transducer. Upper spherically seated compression platen. Samples up to max. 900 x 1400 x 550 mm can be tested.



## Concrete Testing

### Concrete Pipe Crushing Testing Machines Series SDM 500 - 1500 kN



These large testing machines are specially designed for crushing tests on sewer and drain pipes, concrete pipes, fittings, cones and others up to 2000 mm in diameter and 2500 mm length in accordance with EN 1916. Rectangular shaped top bearer is detachable from the actuator. The system does not permit rotation but is swivels in longitudinal direction. Bottom bearer is V-shaped with an included angle of 150°.

shaped with an included angle of 150°.

### Biaxial Masonry Testing Machines Series SDM - B 500 - 1000 kN / 75 - 100 kN



For the large testing machines Series SDM optional horizontal actuators are available for biaxial testing of masonry for the determination of compressive, shear and flexural strength under predefined static vertical compression loads in accordance with EN 1052. Optional drive-in cart for easy loading of the samples with a crane and for the test preparation. The cart can be

pushed easily by hand into the testing machine.

### Reduced Height 19" Power Packs Series PAC



To furnish the pressurized oil for the testing machines. The digital controller can be placed on top for the control of the testing machines. Including large oil tank, pump, filters, pressure limiter, oil-air cooler, low noise internal gear pump. Safety controllers as max. oil temperature, minimum oil level, filter clogged, motor overload. Tank is put on anti-vibration elements

to avoid any vibrations on the console.

### 19" Standard Control Consoles Series NS 19 - PA



Compact and ergonomic control units with integrated hydraulic power pack in the lower part to furnish the pressurized oil for the testing machines. PC running testing software, monitor, digital controller, electrical control and peripheral equipment are integrated. Printer can be placed on the side on swivelling console. Including large oil tank, pump, filters, pressure limiter, oil-air cooler, internal gear pump.

filters, pressure limiter, oil-air cooler, internal gear pump.

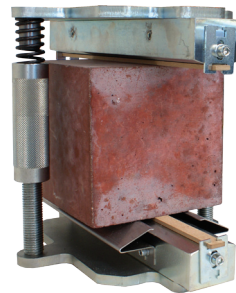
### Extensometers for Concrete Testing



To accurately determine material properties as young's modulus a test system requires a precision extensometer. For that reason w+b offers a wide range of different, high accurate extensometers, with hard and software capabilities for the determination of:

- Deformation
- E-Modulus
- Deflection
- Circumferential

### Devices for Concrete Testing



For an universal use of the testing systems w+b offers a wide range of different devices such as:

- Compression Devices
- 3- and 4-point Flexural Devices
- Tension Devices
- Splitting Device for Cubes
- Splitting Devices for Cylinders
- Energy Absorption Test Devices
- a.s.o.

### Control Console with Measuring and Weighing System Series SP with WMS



The system combines accurate, efficient and productive testing with ergonomic working. It allows a fully automatic determination of weight and dimensions of cubes and cylinders. The measuring-bow is used to measure the sample length. The integrated high precision balance determines the weight of the sample. The specimen height is automatically measured in the compression

testing machine. With integrated hydraulic power pack in the lower part.

### Combination of Different Load Frames to a Testing System



Any load frame can be combined with different testing machines and a control console. The combinations are very cost effective and room saving in the laboratory. The control console can be used for up to 4 machines. Same electronics, controller and software are used. Only one hydraulic pump is needed for several machines.

## Cement Testing

### Ergonomic & Compact Cement Testing Systems Series DB / D Super 200 - 300 kN / 10 - 20 kN

These testing machines are the most advanced models available. They combine accurate and rapid testing with ergonomic working in sitting position. Optional with simultaneous bending and compression testing to reduce the testing time considerably. The testing frames are mounted on a solid chassis. The chassis contains in the lower part the integrated silent hydraulic power pack and on the desk the load frames, controller and PC.



### Devices for Cement Testing

The testing machines are equipped with compression platens for universal application, allowing to place the various compression devices between the platens. Available are the following devices: manual or automatic centring compression test device, E-Modulus test device, flexural test device, press device, split tensile test device a.s.o. The devices conform to relevant international standards such as EN, ISO, ASTM, BS and others.



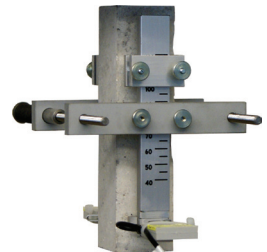
### Compact Cement Testing Systems Series DB / D 200 - 300 kN / 10 - 20 kN

This series of cement testing machines represent the economical alternative to the Series SUPER. Very compact stand-alone testing systems with integrated power pack in the lower part and mounted digital controller. The machine construction features a very rigid two-column design for smooth specimen breaking. The machines are available with digital controller for closed loop control or manual controlled with loading and unloading valves.



### Extensometers for Cement Testing

walter+bai testing machines offers a wide range of extensometers for testing of cement and other building materials. A Precise deformation measurement is done right at the sample. The measuring values are directly interfaced to the testing software and can be used as input for a control channel in closed loop mode testing. Further the values are stored in the database along with the other testing parameters and values.



### Manual or Hydraulic Split Devices Series BV - H / BV - A 40 / 160

These devices are especially designed to break the prisms 4 x 4 x 16 cm in two halves.

- Manual Version Series BV - H: Manual one hand operation and
- Hydraulic Version Series BV - A: Automatic two-hand operation

These devices are only available for the Series D or Series D SUPER of cement testing machines (instead of the bending testing frame.)



### Shrinkage Measuring Test Device Type SWG - H - 400

This testing device is specially designed to measure the dimensional variation (shrinkage and expansion) of triangular mortar-cement samples with additives. The sample size is 70 x 70 x 70 mm and max. length of 400 mm. Included are 2 LVDT displacement transducers and 1 digital transducer indicator with analogue and RS-232 Interface and data acquisition software for recording of deformation and time.



### Tensile Adhesion Strength Tester Series HZP - E 10 kN

Designed for the determination of the tensile adhesion strength of cementations tiles according to EN 1348. Rigid load frame with large base platen and electromechanical actuator mounted on upper crosshead. The base is designed to accommodate and clamp down a sand / cement bloc. To reach the whole testing area, the following parts are movable: actuator in X axis (left to right) and the frame in Y axis (front to back).



### Shrinkage Measuring Test Device Type SWG - 280 and Type SWG - 400

Designed to measure the length variations of cement samples up to 280 mm / 400 mm length. Models available with analogue or digital gauge 5 mm and spindle lifting cable or with digital indicator 12 mm and RS-232 output with cable. Delivery includes transmission software to PC. Reference rods with different lengths for specimens according to relevant international standards and measuring pins are available.



## Bituminous and Asphalt Testing

### Dynamic Asphalt Testing Systems Series LFV - B and Series LFMZ - B 10 - 100 kN



tion, and conventional tests are performed. Option: torsional capability.

The main field of application is bituminous and unbound material testing including conducting of uniaxial testing and research on bituminous mixes to determine resilient modulus, Poisson's ratio, indirect tensile creep and strength, dynamic modulus, tensile strength, phase angle, and flexure fatigue. Further triaxial asphalt, soil resilient modulus, dynamic foundations design, liquefaction, and conventional tests are performed. Option: torsional capability.

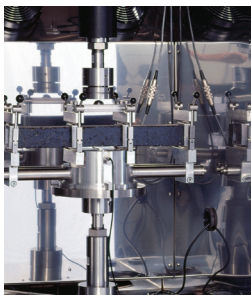
### Environmental Chambers Series ET and Series ETC -40°C up to +300°C



ture sensor and close loop control providing confidence in test results.

Designed for cooling and heating as well as optional humidity. They are available in various sizes and temperature ranges. The chambers can be mounted into testing machine with either fixed brackets or roller carriage assemble enable the chamber to be withdrawn to the rear side of the testing machine. These chambers offer uniform, stable and accurate temperature through a temperature sensor and close loop control providing confidence in test results.

### Devices for Asphalt and Bituminous Testing



adaptable to multiple specimen sizes.

w+b offers a large range of testing devices to suit your specific testing needs:

- Indirect Tensile Test Device
- Asphalt Shear Test Device
- Frozen-Dependent Stress Test Device
- Bending Beam Fatigue Test Device
- Dynamic Modulus Test Device

Further available are jigs, fixtures & accessories from simple uniaxial test jig, pressure cells, autoclaves, triaxial cells

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



specimen, shearing device for asphalt core samples, CBR moulds a.s.o.

This testing machine is 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

## Rock Mechanics Testing

### Rock Testing Systems Series D - D - S 1500 - 10 000 kN



extendable constructed load frames in 4 column construction.

In the field of rock mechanics testing w+b offers testing systems ranging up to 10'000 kN. Such systems require high stiffness load frames that minimize the amount of deformation energy that is stored in the frame. These machines are ideal to perform unconfined compression, triaxial, bending, indirect tension, fracture, creep, and other compression tests. Modular and

### Hydrostatic Pressure Cells and Triaxial Cells



sory for deformation, load and temperature inside the pressure chamber.

We manufacture high-quality pressure cells according to your specifications for standard tests or for research purposes. Construction for stress-strain-experiments, permeability, ultrasonic travel times, acoustic emission and in-vessel sensors. An optional obtainable system enables an optimal adaptation of both piston and particular specimen diameter by simple and rapid handling. Sen-

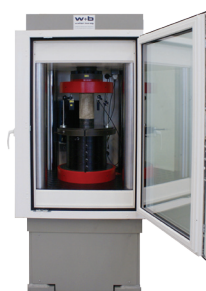
### Electromechanical and Servohydraulic Pressure Intensifiers for Triaxial Cells



accurate and stable control on a very low noise level.

In connection with the triaxial cells servohydraulic and electromechanical pressure intensifiers are available. The unit provides either volume (stroke) or pressure close loop control and phasing in combination with multi-channel control system with the load frame and pore pressure intensifier. These non-pulsating electromechanical or hydraulic intensifiers provides high ac-

### Rock Compression Testing Machines Series D - S 1000 kN



mens and fixing of displacement transducers.

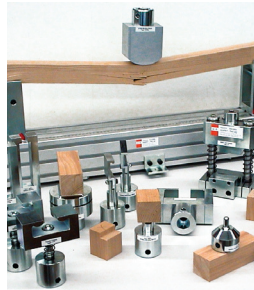
For compression tests on rock in accordance with EN 772-1. The machine is equipped with climatic chamber for simulation of environmental conditions to determine the compressive strength of rocks in accordance with relevant international standards. Isolation through special glass. Three doors around the machine for easy and convenient loading of the specimens



## Wood and Timber Testing

### Fixtures for Wood and Timber Testing

For the field of wood and timber testing there is a wide range of different fixtures available. This includes for example compression platens, 3- and 4-bending fixtures, indentation hardness, shear, screw pull-out, tensile adhesion and cleavage fixtures according to EN, ASTM, BS and other international standards. The fixtures are designed to directly fix into universal testing machines.



### Universal Material Testing Machines for Wood and Timber Tests

We offer a large range of different universal testing machines, which can be configured with testing fixtures for wood and timber testing. The range of machines includes electromechanical or servohydraulic driven and with force ratings from 20 to 300 kN or higher. These testing machines can also be used for a wide range of other tests. Please also refer to our brochure "Material Testing Systems" for further universal testing machines.



### Electromechanical Panel Testing Machines Series EMBP 5500 Nm

This electromechanical testing machine is used to determine the flexural properties of structural panels 4 x 8 ft tested both parallel and perpendicular to the long dimension of the panel in accordance with ASTM D3043 Method C: Pure Moment test. This method is ideally suited for evaluating effects of knots, knot-holes, areas of sloping grain, and patches for their effect on standard full-size panels.



### Pull-Off Testing System Series AZ 50 kN

This test system is specially designed to test the pull-off force of different types of anchors, nails, pins, screws or other fixing components. It comes as laboratory version with 19" control console or with small portable device for on-site use. The pull-off tester is equipped with precision load cell and displacement transducer for measuring accuracy class 0.5. On the handle of the pull of device are buttons integrated to start and stop the test.



## Display, Controller and Software

### Digital Read-Out Type DIGICON 1000

LCD-display and keyboard for data input, interface RS 232 C output for connection to PC. During the test the load increase rate is shown on the screen in kN/sec or N/mm<sup>2</sup>/sec. The peak load is shown and stored. Optional Strip Printer for automatic printout after specimen failure of date specimen size, reference, compressive strength and all other necessary information as per relevant standard. Easy menu driven operation.



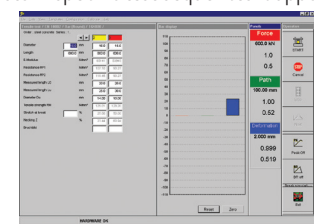
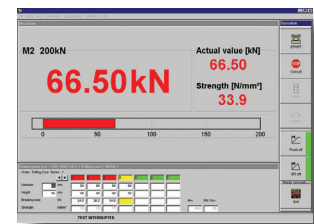
### Digital Closed Loop Controller Type DIGICON 2000

The DIGICON 2000 meets the wide variety of testing needs of laboratories and manufacturers in the field of building materials testing. It is an extendable system that can control up to four different machines in closed loop force, displacement, deformation or external mode. The system itself is free programmable and supports all widely used sample bodies with no dimensional limitations. The control modes can be changed during a certain test for more advanced testing.



### Building Materials Testing Software PROTEUS

Test control, data collection and evaluation and reporting capabilities has never been as user-friendly as it is now when using this application software PROTEUS. This test software offers you both, rapid and productive testing but also specialised applications for advanced testing requirements. The high degree of flexibility brought by template generation and by the test editor allows to configure the program according to the exact specifications. PROTEUS is not only used in cement and ready-mix plants, building material test laboratories, but also for R&D in technical universities. Standard test types according to current standards, can be expanded in a modular way. Option: test editor, to define custom-specific test sequences. Supports all widely used sample bodies with no dimensional limitations. Standard tests and special tests defined and stored as test templates. (Parameters set automatically according to the Standard used.). Data export in ASCII-format. Option: additional processing in external software such as your Laboratory Information Management System. Supports measuring devices such as measuring station, scales and slide gauges.



## Structural Testing

### Servohydraulic Actuators 1 – 3000 kN



For static, pseudo-dynamic, dynamic and high performance testing. These actuators are available as double ended, equal area construction to generate an equal axial force in tension and compression or as double-acting single ended design. A precision displacement transducer is integrated in the actuators. The manifold platen for the servovalve(s) and accumulators are mounted direct on actuators. They are well suited for all types of testing.

### Universal Portal Load Frames



w+b can provide flexibly constructed Portal Load Frames to suits your specific testing needs. The Universal Portal Load Frames are beam and girder constructions where sections can be moved around or added in order your actuators can be placed where they are needed. The frames can be designed for static but also for high performance dynamic testing. The force rating, frame deflection, horizontal and vertical test space depends on your requirements.

### Joints for Servo-Actuators



Designed to eliminate misalignments and side loads from actuators and load cells, which could occurs during structure testing and damage or reduce the service life of your actuator or invalidate test results and cost you time. Available types of joints:

- Cardan Joints
- Ball Joints
- Swivel Bearings
- Fatigue Rated Swivel Rod Ends and Bases

### Hydraulic Power Packs Series PAC / Series PAR 1.5 - 1210 ltr. / min.



For hydraulic oil supply of servohydraulic testing installations. Standard power packs are available with a flow rate up to 1210 ltr. / min. Larger rates upon request.

- Series PAC: Pump with Constant Delivery.
- Series PAR: Pump with Automatic Flow - Pressure Regulation.

## Multi-Channel Applications

### Digital Multi-Channel Control System Series PCS 8000



The controller family is an versatile, flexible control system designed for a wide range of test applications. The PCS 8000 with its advanced real-time close-loop control and data handling, combined with expandable architecture, is available in a range of configurations for single to multi-channel applications suiting the increasingly complex demands in materials and

components testing.

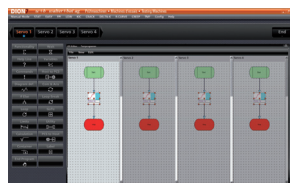
### w+b Materials Testing Software DION 7



Windows-Based Testing Software Family for materials, components, subassemblies, finished goods and functional testing combines the ultimate in rapid and productive testing with specialised and user-friendly applications for

research, product and process development, and quality control applications. The modular designed DION Materials Testing Software are the result of nearly 20 years of enhancements with continuous implementation of customers input and feedback. This platform of software can run everything from simple monotonic (static) tests, simple cyclic to complex multi-axial, multi-channel tests in the field of materials and component tests and simulation. The modular design allows you to buy only the modules you need for your current testing needs. Flexibility is given so that for your future applications you can expand the versatility by simply adding another module.

### Free Programmable Material Testing Software DION FPI



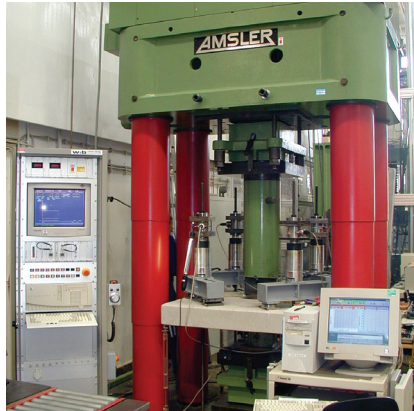
The free programmable interface software package offers the flexible-multi-step environment designed to run everything from simple ramps to dynamic and fatigue single to complex multi-axial materials, component and simulation tests. The clear structured, free programmable graphical matrix allows the logical step-by-step test programming by easy-to-select functions including waveforms, control and data acquisition (logging), synchronisation and phase control, step sequencing, inputs & outputs, events, end-of-test criteria and monitoring. The steps and parameters



are shown in each step avoiding any confusion with hidden information that can lead to operating mistake. Predefined tests (templates) can be selected and run easily to improve productivity and minimize errors.

**Modernisations**

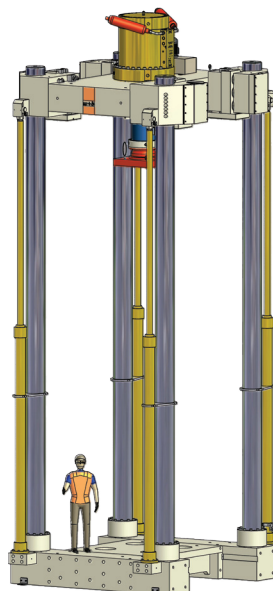
w+b offers different levels of modernisation of existing hydraulic testing machines from all manufacturers. The upgrade of your testing system will bring it back to the most advanced testing control with increased productivity and reliability. No matter of the manufacturer from your system, no matter if the machine is hydraulic or electromechanical driven we will replace the outdated controls with our latest digital controller and personal computer running building material testing software. The modernisation systems offered from w+b are modular designed and usually consists of new digital control and measuring electronics, new hydraulic power pack or new drive system for electromechanical machines, adaptation and upgrading of all existing sensors and different software packages. Further with new accessories we can considerably increase the utilization of the modernized testing machine by adding extensometers, new devices or measuring and weighing systems.



**Customer Specific Testing Machines according to your needs!**

**«Specific testing tasks demand appropriate testing equipment!»**

This is our motto. Therefore, besides our standard range of testing machines, we have developed hundreds of customized testing machines for building materials testing. Due to the extensive know-how in development and production of material testing systems as well as the modular design of our testing machines, electronics and application software, w+b can offer testing machines, test stands and testing systems according to your individual testing needs at cost-effective prices in w+b quality.



## Universal Materials Testing Systems

### Static Electromechanical Universal Materials Testing Machines



These testing machines are designed as table-top or floor standing versions for testing of a variety of different materials, specimens or components for load requirements up to 600 kN. A wide range of accessories are available as well as grips and fixtures covering all relevant applications as testing of rubber, plastics, foils, films, textiles, adhesives, paper, foods, foams, timber, wires, metals and medical, electronic and other components.

### Static Servohydraulic Universal Materials Testing Machines



Available in 2- or 4-column constructions, capable to provide accurate, repeatable and reliable results for tensile, compression, flexure, peel, shear, tear or friction tests up to 3000 kN on a wide range of different materials for quality control, product development, research or process development. Also available with movable upper cross head. These test systems are modular constructed and can be configured with a variety of accessories.

### Dynamic Multipurpose Materials Testing Systems



The fatigue rated systems represents the ideal solution to perform a large variety of static and dynamic materials tests e.g. dynamic fatigue, LCF, crack growth, static tensile and compression tests. The upper crosshead features electrical lift or hydraulic height adjustment with passive clamping system. Available with T-slots platen to fix components and finished goods. Optional with torsional capability for tension/compression-torsion tests.

### Impact Pendulum Testing Machines



w+b offers a wide range of pendulum impact testers designed to fully comply with international standards covering Charpy, IZOD and Impact Tensile Tests. These versatile and reliable machines are available with constant or adjustable impact work for non-instrumented and instrumented tests or with patented laser opto-electronic measuring system. We offer a variety of related products including sample preparation, sample cooling and verification accessories.

### Digital Controllers Series PCS 1000 and PCS 5000



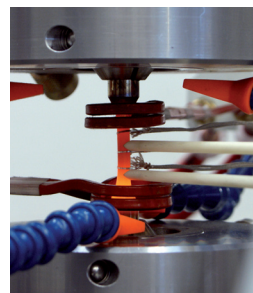
Modular digital controller for closed loop control in load, displacement, deformation or external mode and data acquisition. Specially designed for materials testing machines to ensure accurate and repeatable results with the use of the latest digital technology. This digital controller can be used universally for all types of material testing machines. For this reason it is also an ideal controller for modernisation of existing testing machines.

### Testing Software for Static Monotonic and Dynamic Fatigue Testing DION EASY



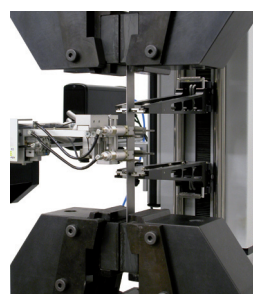
This package offers the easy-to-operate intuitive and highly visual environment to run single to synchronized multi-channel tests. Tests can be defined and run with one function as holding, ramp, sine wave, haversine, triangle, rectangle, sawtooth or pulse functions with Amplitude, Frequency, Break and Save Criteria. The available manual actuator or crosshead control field, digital display including time and cycles counter and graphic simplify the operation.

### Furnaces and Climatic Chambers for the Simulation of Environmental Conditions



The challenging applications such as testing materials used in aircraft turbines, rocket propulsion, hot outer skin structures, automotive industry as materials for exhaust systems, composites or ceramics, requires thermal-mechanical testing installations. We offer a full range of high and low temperature equipment including environmental chambers for low to high temperatures, high temperature furnaces and extensometers, sample pre-conditioning chambers, a.s.o.

### Grips and Fixtures, Extensometers and other Accessories for Materials Testing



Grips and fixtures are available in a variety of sizes and configurations to suit your application needs. The range includes not only mechanical and hydraulic wedge grips but also parallel, non-shift or collet grips. To accurately determine and evaluate the strain length a comprehensive line of extensometers are available. Further accessories include test bar dividing machines and other specimen preparation equipment.

## w+b After Sales Service



### 40 Years of Experience

- Customers choose w+b because we meet your specific testing needs with optimum testing solutions.
- But there is more. After choosing a testing system from w+b it means that this is the starting point of a long-term partnership with us.
- Our network of experienced support and qualified engineers provides you an optimum after sale support to make sure you get the most from your investment.
- Due to this target, w+b continue to invest in hiring and training service engineers or local representatives.
- To cut cost of field service a full staff of application engineers is available for telephone support, which is free for as long as you own your system.
- Our large stock of spare parts from the most w+b equipment helps you to minimise the shut down time in case of problems.
- w+b test systems are designed for hard and long term use. With the w+b service and support, you'll be sure to reap the maximum benefit of your systems throughout their entire life cycle.

### Instruction Manual

For us a reliable support starts with a proper instruction manual. To each system we deliver a complete users manual including information about safety, system installation, machine setup, technical drawings of testing structure, hydraulic and electric drawings with part legend, soft and hardware manuals, maintenance information a.s.o. Due to we give the fully information to our clients and in connection with our experienced telephone support more than 90% of all shut downs can be solved by telephone.

### Installation and Warranty

Our Field Service Engineers are available to install and commission your system upon delivery. All our Field Service Engineers are factory trained to complete the installation in a timely manner, to ensure the system operates to specification and to commission the system. All new w+b products carry a factory warranty.

### Customer Training

It is essential that our clients can use the full potential of our testing systems. This requires that the system works properly and that system operators are thoroughly trained in its operation. The instruction provided by our Engineer at the time of commissioning, enables your personnel to operate a system competently. Continued training ensures that new staff are brought up to speed on installed systems, that existing operators retain their skills and that occasional users retain the skills necessary to operate the system. We offer a wide array of regularly scheduled system training courses at our facilities or at your site.

### Hardware & Software Support

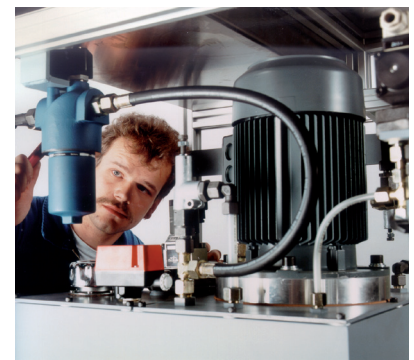
To make sure your investment lasts as long as possible even if your requirements change, our Soft- and Hardware engineers or local representatives will provide you advice on how you can benefit from our steady developing in soft and hardware. This will guarantee you, that your system maintain at peak performance. Through planned service visits for preventative maintenance and calibration any potential system problems are identified and resolved thereby avoiding unnecessary machine downtime.

### Calibration

Our calibration laboratory is accredited according to the latest ISO EN IEC 17025 (formerly EN 45001) standard. The calibration and verification of your material testing machines is part of our service capability. Our Field Service Engineers are not only trained to complete maintenance and calibration service on w+b machines, they also can do it on other testing machines in a timely manner. The calibration certificate will prove the verification of your system with ISO 9000 a.s.o standards.

### Application Service

We can provide test methods, report templates or graphic presentations precisely to your specification, developed within w+b standard software packages. Our application experts have many years experience in materials testing applications and will work with your representative to meet your requirements.



# Maintenance and Calibration of Your Material Testing Installations through the w+b Accredited Calibration Laboratory

**The maintenance and service work on your material test equipment is executed by our specialists with highest attention. With the experience of 40 years! Highly precise computer-aided calibration equipment guarantees a calibration according to the latest standards.**



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Our calibration laboratory is certified according to ISO/IEC 17025 which is recognised through the Multilateral Agreement (MLA) for EA - European Cooperation for Accreditation. The maintenance and calibration through one hand by our specialists with many years of experience assure a reliable execution. Your savings: no extra costs for an additional calibration by a further official calibration institute, since we are an accredited calibration

laboratory. We calibrate your test equipment independently of type and manufacturer. We offer excellent conditions as well as appointed dates. The accreditation according to ISO/IEC 17025 is recognised through all signatories of the EA (European Cooperation for Accreditation) multilateral agreement of calibration. With over 40 years of experience! Please do not hesitate to ask for a quote!

## We are accredited Calibration Laboratory for:

- Force - Tension, Compression
- Pressure
- Length - Displacement, Deformation
- Hardness
- Energy - Impact Tester



### On-Site Calibration and Service at Customers Laboratory

At the calibration on site at the customers laboratory a maintenance and service can be offered and executed at the same time. Usual maintenance includes:

- **Hydraulic testing machines:** if necessary the oil and filter elements are changed, control of connections and pressure houses as well as the cooling system.
- **Tensile testing machines:** maintenance of the clamping devices, the fixation of the specimens, checking of the control and safety system.
- **Compression testing machines** according to EN 12390-4: compression platens and strain test loading rates are checked. The function of the control and safety system are inspected as well.

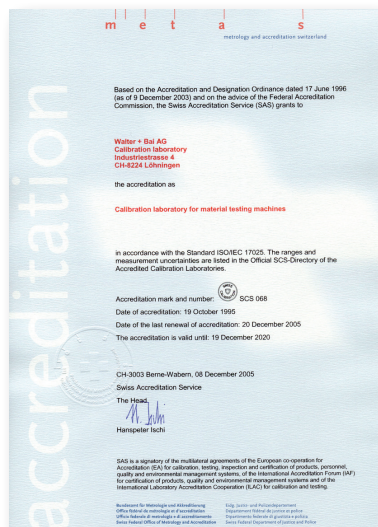


### Factory Calibration

At our calibration laboratory we are equipped for highly accurate calibration of load cells, pressure transducer, extensometers, displacement transducers a.s.o.

All calibration will be carried out according to the latest international standards.

**The accreditation according to ISO/IEC 17025 is recognised through all signatories of the EA (European Cooperation for Accreditation) multilateral agreement of calibration.**



Measuring Units	Range	Conditions	Uncertainty <sup>1</sup>
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Force			
<b>Tension and Compression Testing Machines</b>	2 N - 200 N 0.2 kN - 240 kN	force block and load cell Class 0.5 according to ISO 7500-1 and ASTM E4	0.06% to 0.12%
<b>Tension and Compression Testing Machines</b>	20 N - 200 N 20 kN - 1500 kN	load cell Class 0.5 / 1 according to ISO 7500-1 and ASTM E4	0.06% to 0.12%
<b>Compression Testing Machines</b>	400 kN - 5 MN	load cell Class 0.5 / 1 according to ISO 7500-1 and ASTM E4	0.12% to 0.24%

Pressure			
<b>Static Pressure Gauges</b>	0 - 20 bar 20 - 500 bar 500 - 5000 bar		0.3% <sup>2</sup> 0.2% 0.3%

Length			
<b>Extensometer up to 50 mm</b>	Resolution 0.1 µm Resolution 0.5 µm Resolution 1.0 µm	according to EN ISO 9513 and ASTM E83	(0.2 + 0.1 L) µm (0.6 + 0.1 L) µm (1.2 + 0.1 L) µm
<b>Deformation Transducer, Dial Gauges up to 60 mm</b>	Resolution 1.0 µm Resolution 2.0 µm Resolution 10 µm	Calibration Device KMF1	(1.2 + 0.1 L) µm (2.0 + 0.1 L) µm (10.0 + 0.1 L) µm
<b>Piston Stroke or Cross Head Travel</b>	300 mm		(0.05 + 0.00.1 L) µm

Hardness (direct and indirect)			
<b>Brinell Hardness Testing Machine</b>	Hardness Procedure HBW according ISO 6506-2	test blocks according to ISO 6506-3	Error max. according to procedure standard
<b>Rockwell Hardness Testing Machine</b>	Hardness Procedure HRB, HRC according ISO 6508-2	test blocks according to ISO 6508-3	Error max. according to procedure standard
<b>Vickers Hardness Testing Machine</b>	Hardness Procedure HV according ISO 6507-2	test blocks according to ISO 6507-3	Error max. according to procedure standard

Energy			
<b>Impact Tester</b>	15 - 300 J	according to ASTM E23 - 96 and ISO 148-2	

<sup>1</sup> according to ISO 376 and ASTM E74

<sup>2</sup> but not smaller than 20 mbar



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**Testing Machines**

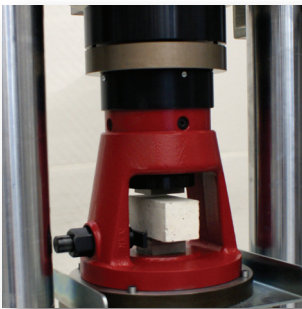
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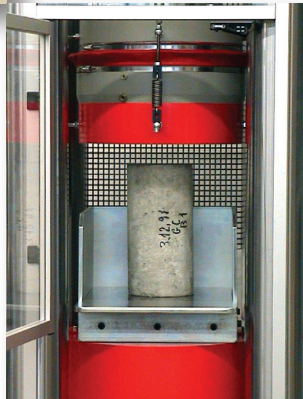
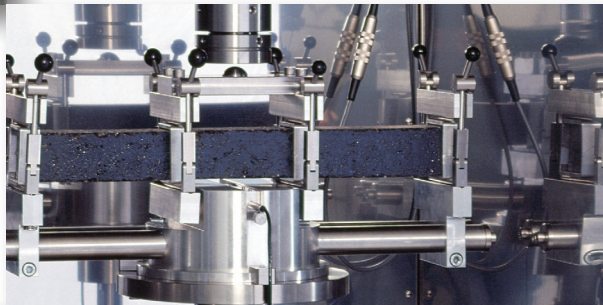


**SCS 068**



## Testing Systems for

- Cement
- Concrete
- Asphalt and Bituminous Materials
- Rock Mechanics
- Wood and Timber



- Structural Testing Installations
- Modernisations of Existing Machines
- Customer Specific Testing Machines
- Digital Controllers and Testing Software
- Accessories for Building Materials Testing
- After-Sale Service
- Accredited Calibration Laboratory