

## Fiber-Reinforced Concrete and Mortar Testing Machines Series DBZ up to 500 kN

The DBZ building materials platforms are robust and versatile static testing machines tailored for accurate and repeatable testing of fiber-reinforced concrete and mortar.

These flexural test systems can be equipped with a wide range of test fixtures to perform flexural, compression and tension tests on a variety of materials.

The DBZ series features beside of the rigid 4-column load frame reliable w+b servo-controlled hydraulic actuation with high-resolution & high-speed digital closed loop control and latest software platform.

These test systems include everything to comply with the requirements of building materials testing and includes specific technical features as double acting actuator with closed coupled high-responsive servovalve and high-speed digital controller making these systems the perfect solution for testing of fiber-reinforced concrete and mortar as well as strain-controlled test of building materials.



## Testing of Fiber-Reinforced Concrete

Testing of fibre-reinforced concrete are nowadays fully standardised through European (EN) as well as ASTM standards. These tests make sure, that the performance and characteristic of fibre-reinforced concrete is determined in a way that guarantees the safe use of it in todays and tomorrows applications.

To perform these EN and ASTM tailored tests the testing machine must be suitable to deliver accurate and repeatable test results. In order the test requirements for testing of fiber-reinforced concrete can be fulfilled the testing machine must have some performance that tops the normal requirements of building materials testing machines.

Most important technical characteristics of the testing machine suitable for testing of fiber-reinforced concrete are:

- High responsive closed-loop control
- rigid load frame with low stored energy which will release at the first break of the specimen
- high-resolution system for accurate data acquisition and control
- flexibility for productive testing.

Our DBZ models are produced with this and further requirements in mind and assure accurate test results.

## Reliable & Durable

Our prior goal, coupled with an experience of 50 years in the production of building materials Test Systems, is to deliver accurate and durable tests solutions to ensure that you obtain the maximum rewards from your investment.

w+b building materials Testing Machines combines proven load-frame design, reliable w+b servocontrolled hydraulic actuation combined with advanced high-speed, high-resolution digital closed loop control for trouble-free long-term operation.

## Accurate

Our DBZ series delivers repeatable and accurate test results as this test systems incorporate features developed on our long experience.

- Machine equipped with accurate load cell for direct force measurement
- Differential actuator with closed mounted servovalve for most responsive control in combination with high-speed digital Controller
- Machine work with real closed loop control in combination with high-responsive servovalve
- High system stiffness for long-term repeatable testing
- High-accurate analogue digital signal conversion with low noise
- And many others

## Modular & Flexible

Our advanced machine design makes our systems not only best suited for the determination of the flexural and compressive strengths in the field of quality control but also compatible with a wide range of fixtures, extensometer and other accessories suitable for a wide range of demanding applications for research and product development.

These test systems are flexible and can be configured to different tests with different sample types.

## Versatile Load Frame Design

These rigid 4-column load frames are highly versatile with it's in the upper crosshead integrated actuator and large lower T-slot platen.

The lower T-slot table allows to mount supports for flexural tests, use compression platen or compression devices or use any other grip, fixture or working tool including those who work in tensile direction.

The lower T-slots offer easy adjustable distance of lower bending supports with easy and accurate adjustment of the support distance through scale and marks.

The double acting actuator on top features long piston stroke and mounted precision flat load on piston rod end.

The actuator having an anti-rotation system to prevent the natural tendency to rotate. This allows the use of displacement transducer (option) for piston stroke control or measurement.

The machine offers ergonomically working height with excellent access for easy and efficient testing.

The columns are chromium plated.

## High Stiffness Load Frame

In order repeatable test results with smooth specimen breaking can be achieved and robust, durable and long-term trouble-free operation is assured our load-frames are designed with ultra-high load frame stiffness.

This superior axial stiffness minimize the stored energy in the frame that will abruptly release at specimen failure and cause shock to the specimen and machine.



## Mounting of Grips, Fixtures and other Test Tools

The DBZ Test System uses a standardized mounting-stud connecting system with counter nut that provides easy, quick and accurate mounting of any accessories with mounting-stud with Pin. The supplied counter (lock) nut provides backlash-free accessories mounting. The mounting-stud is standardized and will fit to w+b accessories.

## Additional Load Cell

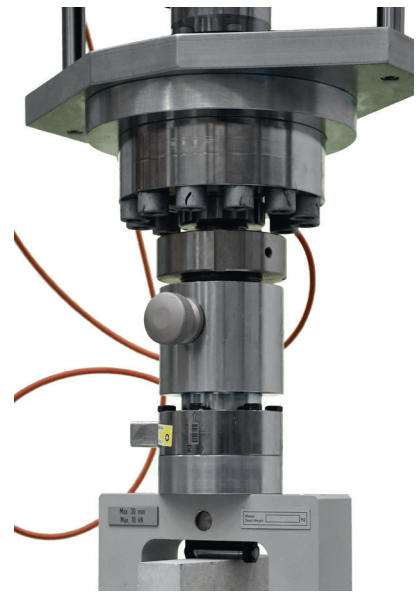
If your test requirements necessitate to use a load cell with small forces, the DBZ gives you the possibility to add additional force transducers with the nominal force range suitable for your test requirements. The mounting via mounting-stud with Pin is easy. Having the suitable load cell installed will increase your test accuracy.

## Latest Control Technology

All our DBZ Testing Machines are closed loop through the latest digital control system DIGICON 3000. This controller represents the latest generation of digital measurement and control system tailor-made for testing of building materials including applications where high-responsive control is required.

The DIGICON 3000 features high-speed control and data acquisition and is well suited for force, piston stroke, - or crosshead, deformation and other closed-loop modes.

The controller works through high-speed Ethernet interface with Proteus-MT application software.



## Proven Servohydraulic Actuation

All our test systems offer reliable w+b servo-controlled hydraulic actuation through real servovalve operation for the most reliable and accurate closed loop control in force / stress / deformation / strain or piston stroke control.

## Ready for your Test Demands of Today & Tomorrow

To be prepared for the future, Proteus-MT is available with communication interface to several Laboratory Information Management Systems (LIMS) as:

- LIMS or CIMS of ABB • Sauter • La strada • Lisa Lims • Cobet • Jouaux • Limsophya
- FireQ • Dorner • LIS or PDV Dyckerhoff • Limsophy • and others

Our digital controller can control monotonic servohydraulic as well as electromechanical AC or DC driven testing machines.

In combination with servohydraulic test systems, this controller can control up to 4 testing machines / frames in alternating mode with one servovalve.

This assures you, that you will be able to connect additional load frames to your cement test systems as for examples concrete compression test frame to be operated with the control system of your cement testing machine.





## Comply with International Standards

The DBZ series are designed for the determination of the flexural, compressive, tension and other strength according to international standards including but not limited to:

### ASTM C1609

This test method describes the flexural performance of Fiber-Reinforced Concrete using beam with third-point loading.

The first-peak strength, peak strength, and residual strengths determined by this test method reflect the behavior of fiber-reinforced concrete under static flexural loading. The absolute values of energy absorption obtained in this test are of little direct relevance to the performance of fiber-reinforced concrete structures since they depend directly on the size and shape of the specimen and the loading arrangement.

### EN 14651:2007

This test method covers the measuring of the flexural tensile strength (limit or proportionality (LOP), residual) of metallic fiber concrete.

### EN 14488-3:2021

This method specifies the determination of the flexural strength (first peak, ultimate and residual) of fiber reinforced beam of sprayed concrete.

### DBV-Merkblatt "Steel Fiber Concrete"

This DBV Guide of Good Practice describes the flexural tensile strength of fibre-concrete

### EN 14488-5:2006

This part of European Standard specifies a method for the determination of the load/deflection response of a fiber reinforced slab specimen in order to calculate the energy absorption capacity up to a specified deflection.

### ASTM C1550:2020

This test method covers the determination of flexural toughness of fiber-reinforced concrete expressed as energy absorption in the post-crack range using a round panel supported on three symmetrically arranged pivots and subjected to a central point load. The performance of specimens tested by this method is quantified in terms of the energy absorbed between the onset of loading and selected values of central deflection.

The nominal dimensions of the panel are 75 mm in thickness and 800 mm in diameter.

### EN 12390-5: 2019

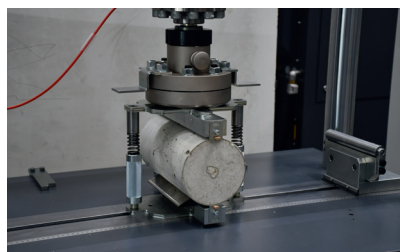
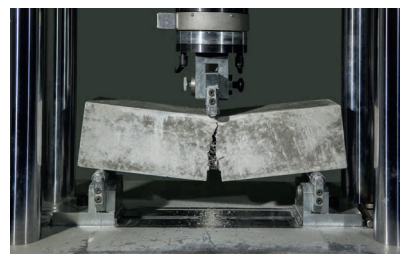
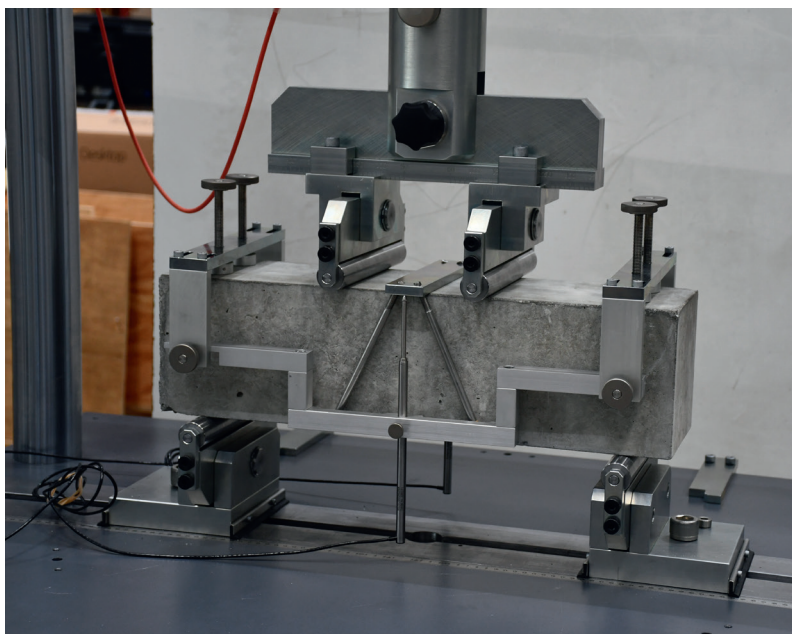
This method specifies a method for the determination of the flexural strength of specimens of hardened concrete.

### EN 12390-6:2010

This method specifies the tensile splitting strength of hardened concrete

### EN 12390-13:2019

This test method specifies the determination of secant modulus of elasticity in compression of hardened concrete.



## EN 196-1:2016

This method describes the method for the determination of the compressive and, optionally, the flexural strength of cement mortar specimen 40x40x160 mm. The method applies to common cements and to other cements and materials, the standards for which call up this method.

## ISO 679:2009

ISO 679:2009 specifies a method of determining the compressive and, optionally, the flexural strength of cement mortar specimen 40x40x160 mm

## ASTM C109 / C109M-16

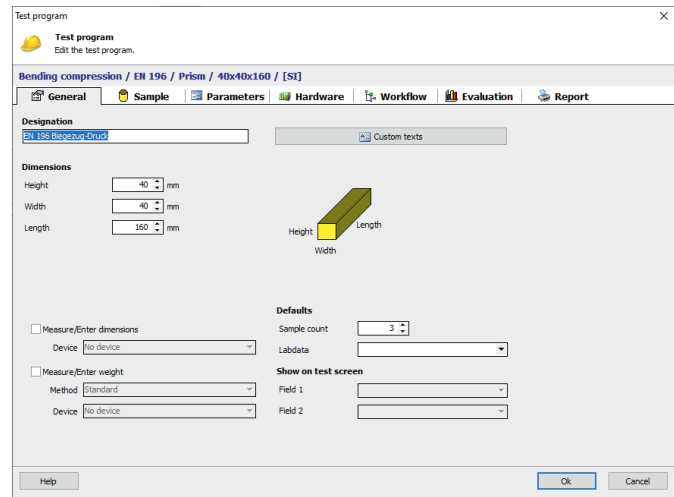
This test method provides a means of determining the compressive strength of hydraulic cement and other mortars using 2-in. or 50 mm cubes and results may be used to determine compliance with specifications. Further, this test method is referenced by numerous other specifications and test methods. Caution must be exercised in using the results of this test method to predict the strength of concretes.

## ASTM C349-18

This method provides a means of obtaining compressive strength values from the same specimens previously used for flexural strength determinations by Test Method C348. The compressive strength values are for reference purposes, and not as substitutes for values obtained by Test Method C109/C109M for cement acceptance.

## ASTM C348-18

This test method provides a means for determining the flexural strength of hydraulic cement mortars. Portions of the mortar prisms tested in flexure according to this test method may be used for the determination of compressive strength in accordance with Test Method C349.



## DBZ Operation Control Console with integrated Hydraulic Power Supply

his space saving and ergonomic operation Control Consoles are modular designed and available for all DBZ Series machines, provide closed loop servocontrolled hydraulic actuation in combination with high-resolution and high-speed digital control system, servovalve and load-cell, piston stroke transducer, extensometer or any other external transducer.

The Control Console offers ergonomic and space-saving operation that includes in the upper part integrated necessary periphery equipment like personal computer with running material testing software, screen, keyboard, digital controller and electrical switch board. The hydraulic power supply which furnish the necessary pressurised oil for the DBZ machine is integrated in the base of the Control Console. Due to the used internal gear pumps the system base a very low noise level. The tank is put on anti-vibration elements to avoid any vibrations on the console. The hydraulic part includes oil tank, pump, safety controls, pressure limited, oil filter, oil/water cooler or oil/air cooler (external) etc, filter glogged indicator, temperature limit switch, low oil level switch and more.

### Features

- Compact and ergonomically unit
- Integrated large oil tank
- Low noise internal gear pump as main pump
- Oil filter with electrical indication when filter is glogged
- Oil/water cooler with thermostatic regulation water-valve for minimum water consumption or oil/air cooling
- Electrical maximum temperature protection
- Electrical minimum oil level protection
- Electrical motor protection

### Low-Noise

The hydraulic power supply for the test system is integrated in the base of the machine. The machine is designed in order it can operate with a system pressure below 300 bar. The hydraulic pressure and oil-flow is generated by a low-noise internal gear pump that works with low pulsations. The motor-pump group is mounted vertical on the tank so that the pump submerged into the oil. This compact design helps to reduce the noise level.

### Integrated In-Line Hydraulic High Pressure Filter.

The performance, life-time and reliability of servohydraulic test systems is acutely sensitive to the quality of the hydraulic oil. The experience of designers and users of hydraulic oil systems has verified that over 85% of all system failures are a direct result of contamination. As a consequence our power packs are equipped with In-Line Hydraulic Pressure Filters with absolute filtration of 10 µm to assure that clean oil. The size of the filters are large in order long service life of the elements are reached.

### High Efficiency Motor(s)

As part of a concerted effort worldwide to reduce energy consumption, CO2 emissions and the impact of industrial operations on the environment, various regulatory authorities in many countries have introduced or are planning legislation to encourage the manufacture and use of higher efficiency motors. Consequently all motors used in our test systems comply with the Premium Efficiency IE3 level according to IEC 60034-30-2008.

### Designed for Permanent Operation

The hydraulic power pack of the testing machine is cooled by an air-oil cooler or alternative available with oil-water cooling system and can be operated in permanently. Integrated control and monitoring of the oil-temperature, filter element and oil-level is also provided.

### Designed for Serviceability

Special attention was paid to the serviceability of our Cement Testing Machines. Parts are easy to clean and good access to hydraulic and electric installation is provided.





## Digital Control System DIGICON 3000 for Building Materials Testing Machines

**DIGICON 3000 is a high-speed digital measurement and control system tailor-made for testing of building materials.**

These controller feature high closed loop control and data acquisition rate and is therefore the best solution for applications where high responsive control is required as for example testing of fiber-reinforced concrete.

The DIGICON 3000 can control monotonic & dynamic rated servohydraulic test systems as well as electromechanical AC or DC driven testing machines.

In combination with servohydraulic test systems, this controller can control up to 4 testing machines / frames in alternating mode with one or optional two servovalve.



The DIGICON 3000 interface PROTEUS-MT over Ethernet interface.

This offers full configuration through PROTEUS including configuration, linearisation and calibration.

### Features:

- Application-Designed for closed loop control of building materials testing machines
- Suitable for applications where high closed loop control rate and high responsive systems are required.
- Closed-loop control of force, piston or crosshead stroke, deformation or any other physical sensors.
- Advanced functionality in combination with Proteus Software Package.
- Latest controller generation provides long life-cycle
- Provides accurate closed loop control with closed loop control rate of up to 8000 Hz (8 kHz)
- High data acquisition rate on all channels
- Controller can be equipped with up to 8 amplifier cards for closed-loop control or data acquisition
- Optional available PCI-ADC card for additional data-logging channels
- Integrated digital I/O's to interface external devices
- Interface to measuring devices with data transmission into Proteus Software for specimen weight and dimensions with automatic calculation of density, area etc.
- Peak-value controller suitable for cyclic applications
- Machine interlock direct from controller including protection device, quick piston drawdown, unpressurized circulation etc.

## Reliable

This latest generation of data acquisition and control unit reflect the knowledge and best practices gained from decades of experience. The unit includes consequent enhancement and continuous implementation of hundredfolds successful installation across the globe since early 1970's..

## Versatile

The DIGICON 3000 can be configured to control static & dynamic servohydraulic as well as electromechanical testing machines. With its up to 16 available channels for data acquisition and control this controller can be configured to meet your unique needs of today and can be extended in the future when your test needs would change.

## Accurate

The DIGICON 3000 digital controller offers 2000 Hz (option for 8000 Hz) closed loop control rate and 1000 Hz data collection on all channels. This enables you to generate high resolution test data for analyses. The high speed closed-loop control rate assures high control accuracy and repeatable tests.

## Operator Safey

The controller fully comply with current safety requirements. Protection devices can be connected direct to the controller.

## Interface to Proteus Software Platform

The DIGICO 3000 offers an extensive and growing library of standards-compliant test methods and free to program sequences and full complement of accessories for cement, concrete, asphalt, wood and other materials testing.

## Export

This controller offers the test data export even when used at standalone unit without application software Proteus. The test data are saved as XML-File and can be exported via USB port to your host system for data backup, data processing, creating your own reports or import into an existing laboratory information management system (LIMS).

## External Remote Touch Unit

The DIGICON 4000 can be supplied with external Remote 7" color touch screen that allows to install the operating touch screen up to 2.5 meter away from the controller.



Technical Data	
Closed-loop control rate	2 kHz, option for up to 8000 Hz
Data acquisition rate	1kHz
Measurement channels	8/16
Analogue resolution	18 Bit with SAR-Technology
Digital channels	SSI 24 Bit, 3x Incremental
10 V analogue outputs	16 Bit
Valve	Two (2) Servovalves with current or voltage
PC-Interface	Ethernet / LAN
I/O-Interfaces	USB/RS232



## Testing Software for Building Materials PROTEUS-MT

We offer flexible and powerful building materials testing software. Available are different software packages in accordance with the relevant international standards.

The packages offers fully automatic control of the test procedure and data collection of results including analysis and reporting.

Control and evaluation has never been as user-friendly as it is now when using these application packages.

These packages offers you both, rapid and productive testing but also specialized applications for advanced testing requirements.

The screenshot shows the ProteusMT software interface. The main window displays the company logo and contact information for w+b walter+bai ag. The right-hand side features a control panel with various settings and a status display.

**PROTEUS<sup>MT</sup>**

Prüfmaschinen Machines d'essais Testing Machines

**w+b walter+bai ag**

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Tel. +41 (0)52 687 25 25      www.walterbai.com  
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ISO 9001      EN ISO 9001  
Certified system      Quality Management System

SCS 068  
Swiss Calibration Service

**Setup window**

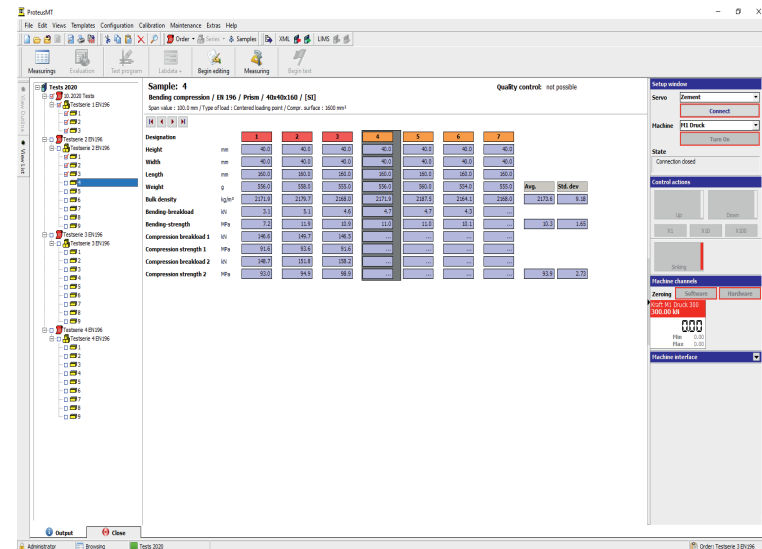
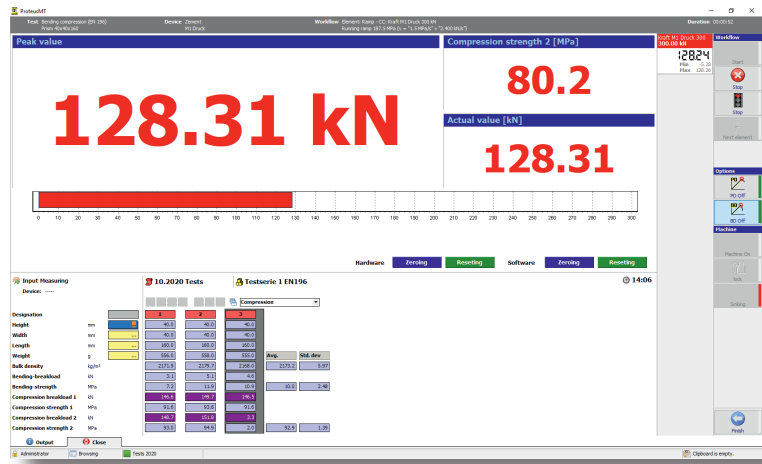
Servo: Zement  
Machine: M1 Druck  
State:   
Control actions: Up, Down, X.1, X.10, X.100, Spiking  
Machine channels: Zeroring, Software, Hardware  
M1 Druck: 300,00 kN  
Min: 0.0, Max: 0.0  
Machine interface

## Testing Software for Building Materials PROTEUS-MT

PROTEUS-MT offers many advantages in the field of building materials testing. Test control, data collection and evaluation and reporting capabilities have never been as user-friendly. PROTEUS-MT offers both, rapid and productive testing but also specialised applications for advanced testing.

### Features

- The high degree of flexibility brought by template generation and by the test editor allows configuring the program according to the exact specifications needed.
- PROTEUS-MT 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.)
- Custom test templates can be scaled according to the number of measurements, of decimal places, etc.
- Keying in an order and testing as separate activities.
- Mixed tests within a single test order (e.g. Elasticity Modulus and Pressure Test, etc.)
- Log output (including charts) according to type of test and of sample.
  - Option: form designer for custom adaptation of log.
- Structured Database (SQL) with additional custom data that can be defined at every level (Order-Series-Sample), Object-Oriented, Modular and Network-Ready
- 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.
- Password protection for sensitive functions (H/W configuration, templates, etc.)



## Testing Software for Building Materials PROTEUS-MT

### Templates Make Testing Fast and Easy

Test templates contain all parameters needed for testing, such as Type of Sample, Type of Test, Test Standard, Quality Control, Graphical Representation and more. Several tests within a single order performed by assigning a test template to the series. Custom-made additional test templates can be defined in addition to the standard ones.

### Simple to Operate

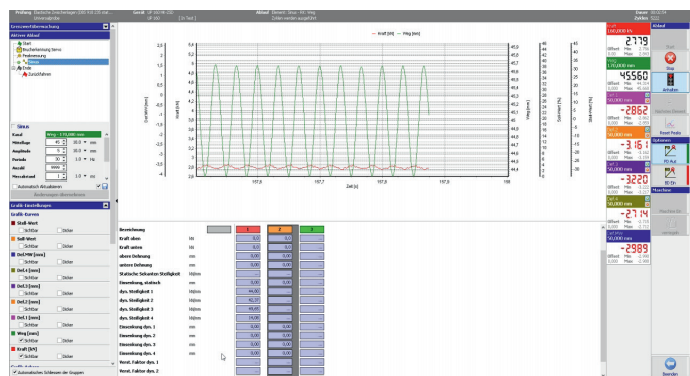
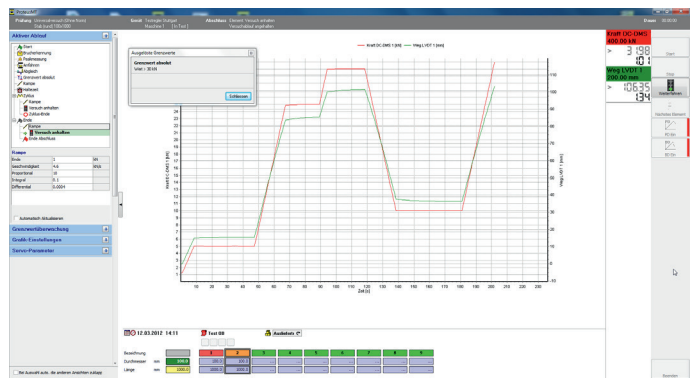
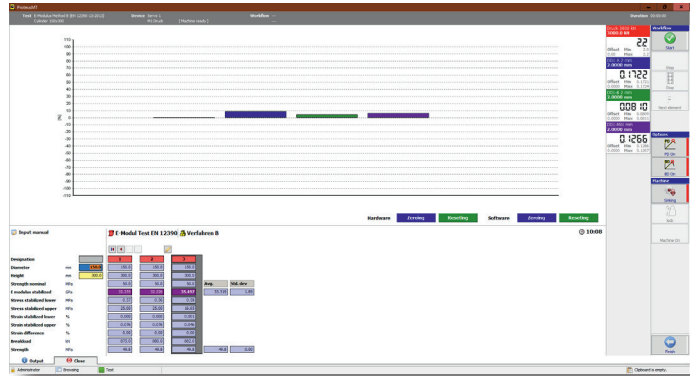
- All program functions can be selected with the mouse. The main functions may also be called with a combination of keys. Powerful object-specific functions called directly with the right mouse button to speed up operations: Copy, Paste, Clear
- Test classification in a relational database
- Database Structure: Databases can be structured according to any suitable folder hierarchy. Thus, tests can be sorted according to individual criteria, e.g. according to customers or suppliers, materials, type of test, time scales, test bodies. Each database contains any number of orders and series. A series contains at most 99 samples. Example: An order contains 3 series (Age 2, 7 and 28 days), each one with 3 samples.
- Data Export for Additional Processing: The data export function provides an interface with other external programs and stores the data in standard ASCII format. Option: Customer-specific ASCII formats.
- Logging: All series in an order can be printed out. The type of form is correctly handled by the Logging Manager, based on the test template. Option: Form Designer for custom-specific adaptation of forms.

### Standard Sample Bodies

Depending on the type of test and the standard, the following approved sample bodies are available:

- Cubes:  
10, 15, 20 cm, 4, 6 inch
- Cylinders:  
10 x 20, 12 x 36, 15 x 15, 15 x 30,  
16 x 32, 20 x 20, 20 x 40 cm
- Drilling Cores:  
50 x 50, 50 x 100, 80 x 80, 80 x 160 mm
- Prisms:  
40 x 40 x 160 mm
- Bars:  
10 x 15 x 70, 12 x 12 x 36,  
15 x 15 x 70, 20 x 20 x 90 cm
- Plates:  
60 x 60 x 10 cm

Dimensions to be selected without limitations.

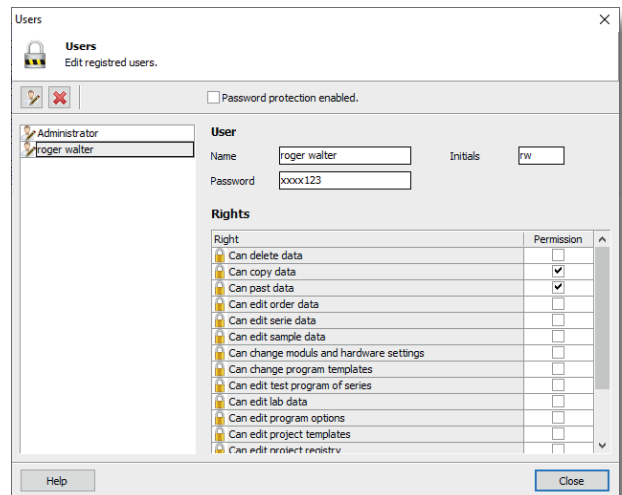
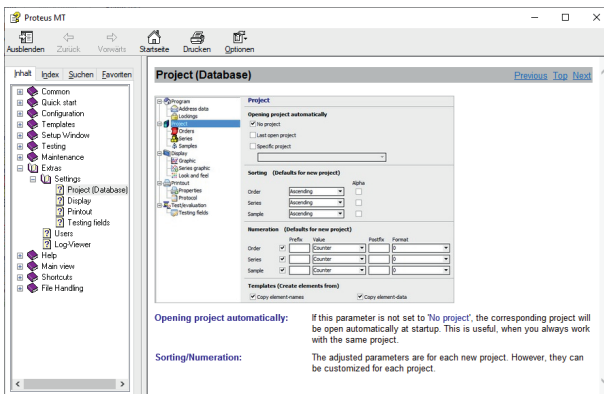
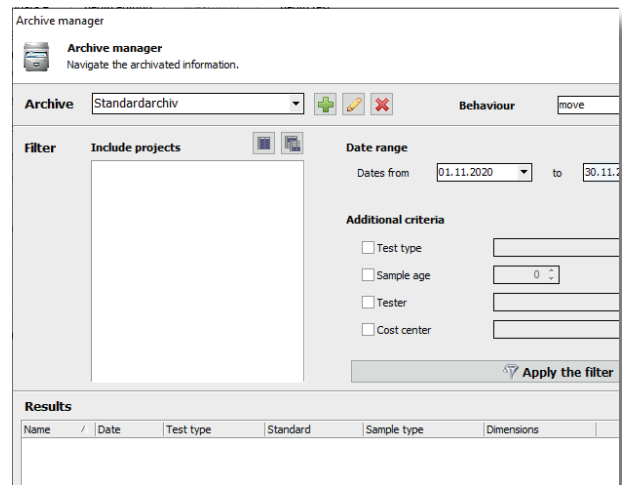
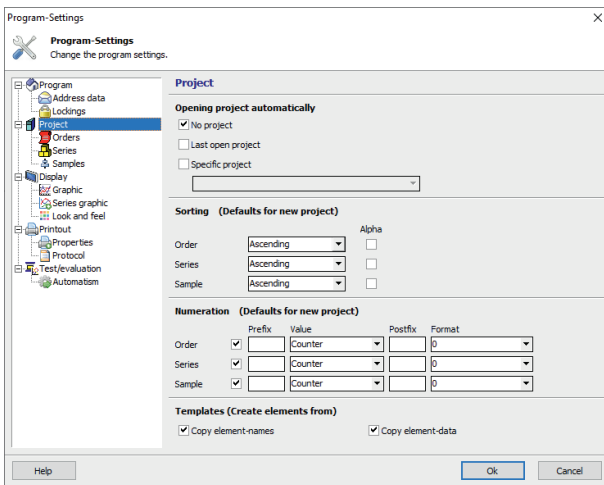




## Testing Software for Building Materials PROTEUS-MT

### PROTEUS-MT Basis Module

- Data base contains a sample administration.
- Actual test and printer list with calendar make the daily work easier
- Connection of several controllers or measurements with up to 4 machines each is possible.
- For the combination bending-compression test 2 controllers are simultaneously in operation.
- Works with sliding gauge, balance, dial gauge and digital measuring station.
- Templates simplify the tests fundamentally. They are made with help of an assistant.
- Universal and special tests can be arranged on a graphically surface.
- Automated routine tests are easily created
- Password protection for the laboratory head for templates and hardware adjustments
- Standard export of the results in the ASCII-format for further processing in other programs
- Standard protocols for all tests, optional with or without graphic.
- Number of digits and rounding of the results can be indicated in the templates.
- Laboratory data base for further data fields in the order or series with choice of data, text and numeric fields with description and sorting
- Program for the calibration of the machine with DIGICON 2000/3000



## After Sales Service

The world-wide network of w+b highly qualified factory trained support staff provides customers with comprehensive after sales solutions for w+b testing systems.

We are focused on the individual customer support and the offered services include on-site installations, repairs and maintenance throughout the entire life cycle of your testing equipment. Customers of w+b know they can benefit a maximum from the acquired testing equipment, and with provided after sales service they are in good hands – now and in the future.

### Over 50 Years of Experience

- Customers prefer w+b because of our individual customer approach coupled with flexibility and versatility in developing the most customized and specific testing systems.
- However there is more. By choosing a testing system from w+b you start a long-term partnership with us.
- With our world-wide network of w+b highly qualified support and maintenance engineers provides you with an optimum after sales support, to make sure you get the most from your investment.
- w+b constantly invests in hiring and training service engineers and local representatives.
- w+b provides customers with comprehensive free of charge telephone support of all specialists for the lifetime of the product.
- Our large stock of spare parts from the most w+b equipment helps you to minimize the idle time in case of problems with equipment.
- w+b test systems are designed for stable and long term operation. With the provided constant comprehensive service and support you will profit the maximum from your systems throughout their entire life cycle.

### Instruction Manual

At w+b a comprehensive customer support starts with a detailed instruction manual. To each system we deliver a complete technical manual including information about safety, system installation, machine set-up, technical drawings of testing system, hydraulic and electric schemes with items list, software and hardware manuals, maintenance information, a.s.o. By providing from very beginning this technical information to our clients, which is later on demand complemented by telephone support, enables us to have practically more than 90% of all shut-downs solved instantly.

### Installation and Warranty

Our qualified field service engineers are available in short terms to install and to commission your testing system on site after its delivery. All our field service engineers are factory trained and complete the installation in a timely manner. Our service guarantees the reliable commission and operation of your testing system according to the technical specification. All w+b products are covered by a factory warranty.

### Customer Training

It is essential that our clients use w+b testing systems to its full extent, i.e. by employing all possible features and capabilities of the acquired equipment. Additionally, as a well-known fact the comprehensive knowledge of machine operation practically reduces the instrumental setup times, also prevents possible mistakes and in turn increases your testing efficiency. Therefore, the technical instruction and extensive operation training are provided by w+b engineer at the time of system's commissioning. Further repetitive training, organized either on site or at w+b premises, ensures that new system's operators from customer side are properly instructed on the operation capabilities of the installed system, likewise the skills of already trained operators are refreshed and retained. We provide an extensive range of comprehensive training courses focused on complete machine operation, software usage, sample alignment, all types of materials tests, and many others. These courses can be scheduled with a short notice and given either at w+b or at your premises.

### Hardware & Software Support

To ensure that the acquired system can be steadily employed even though your testing requirements are changing with the time, our software and

hardware engineers, including w+b local representatives, will assist you with these tasks, as well as you will receive the detailed information on w+b continuous development of software and hardware. This will guarantee that your system is maintained at peak performance. Through planned and systematic service visits of our engineers for preventive maintenance and calibration of your testing system, any potential problems can be identified beforehand and resolved immediately avoiding unnecessary machine's idle time.



### Calibration

w+b calibration laboratory is accredited according to the latest ISO EN IEC 17025 (formerly EN 45001) standard. The calibration and verification of your materials testing machine is a part of our provided service. Our field service engineers are not only trained to perform maintenance and calibration service on w+b machines, also the testing machines of other producers are successfully verified and calibrated in a daily manner. The calibration certificate will prove the verification of your system conforming to ISO 9001 and other standards.

### Application Service

We consult customers concerning testing techniques and provide with necessary tools, as well as we create report templates or graphic presentations precisely suited to your specification, developed based on w+b standard software packages. Our application experts have many years of experience in development of materials testing applications and will create a product to fully meet your requirements.

## Maintenance and Calibration of Materials Testing Systems

by *w+b* Accredited Calibration Laboratory

The maintenance and service works on your materials testing equipment is executed by our specialists with highest attention and precision, and with experience of over 45 years. Highly precise computer-aided calibration equipment guarantees a calibration according to the latest international standards.



SCS 0068

Our calibration laboratory is certified according to ISO/IEC 17025 which is recognized through the Multilateral Agreement (MLA) for EA - European Cooperation for Accreditation. The maintenance and calibration performed by our specialists with 45 years of experience assure a reliable execution of the service. Your savings: there are no extra costs for an additional calibration by a further official calibration institute, since we are an accredited calibration laboratory.

We will calibrate your test equipment independently of the type and manufacturer. We offer excellent conditions together with flexible dates. The accreditation according to ISO/IEC 17025 is recognized through all signatories of the EA (European Cooperation for Accreditation) multilateral agreement of calibration.

### *w+b* Calibration Laboratory is accredited for:

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

