

The new Allround-Line Testing Machine with *testControl II*



1 Zwick Roell – passionate about customer orientation

Zwick at a glance

For more than 150 years the name of Zwick Roell has been synonymous with technical expertise, innovation, quality and reliability in materials and component testing. As world leaders in static testing, while experiencing significant growth in fatigue testing systems, we enjoy our customers' confidence. Through innovative product development, a comprehensive product range and worldwide service and support, this family concern delivers tailor-made solutions to meet the most demanding requirements of research and development and quality assurance in over 20 industries. With around 1,000 employees, a production plant in Ulm, Germany, additional subsidiaries in Europe, the USA and Asia, plus agencies in 56 countries worldwide, the Zwick brand name guarantees the highest product and service quality.

Passionate customer orientation forms the basis of our corporate philosophy. Dependability, straightforwardness and professionalism define our actions as we seek to establish long-term relationships with our customers based on mutual trust. Every customer is important to us - large-scale undertakings, small firms, institutes and universities.

We always give of our best; we help customers to be more successful through expert advice, tailor-made solutions, innovative products and a comprehensive range of services.



Fig. 1: Administration Building, Zwick Roell AG and Zwick GmbH & Co. KG, Ulm

The Allround-Line by Zwick – setting new standards in materials testing

Allround-Line testing machines

The new generation of Allround-Line testing machines sees Zwick once again setting the standards in static materials testing. A proven operating concept combined with flexible, modular load-frame design guarantees an optimum solution for demanding testing applications. The new Allround-Line was developed entirely in-house, with production and assembly taking place exclusively at Zwick's plant in Ulm. This ensures that the expertise gained from supplying over 50,000 testing systems is channeled directly into this new range of testing machines.

testControl II measurement and control electronics

The core of the Allround-Line is the new *testControl II* control electronics, setting new standards in measured-value logging rates and accuracy and offering customers new options with its fast test and positioning speeds.

A product of Zwick's 30-plus years' experience of digital testing technology, *testControl II* represents a significant step towards a uniform laboratory platform which is also suitable for other types of drive. The benefits of this include reduced training and familiarization times and cost-savings in maintenance, repairs and update services.



Fig. 2: The Allround-Line impresses with its flexible range of application and high level of operator convenience



Fig. 1: Zwick assembly shop, Ulm

Engineering „Made in Germany“

Zwick develops, produces and assembles its testing machines exclusively in Germany, ensuring optimum matching of mechanical components. The load-frame profiles and the drive employ patented Zwick technology which enables high-precision test results to be combined with a unique level of operator-friendliness.

Perfectly co-ordinated development, production and sales procedures guarantee short delivery times. Machines can always be modified to suit individual requirements; with Zwick you get what you need – not what we happen to have.



Fig. 2: laserXtens extensometer

Staying one step ahead

Zwick's testing systems are setting new benchmarks. Control electronics, software, test fixtures, load cells and extensometers are all 'made by Zwick', ensuring perfect compatibility within the testing system and guaranteeing traceable test results.

Zwick technology is subject to continuous development. Our innovations are constantly bringing our customers enhanced value and new benefits.



ISO 9001
ISO 14001



The right investment for the future

Our 'Made in Germany' quality standard is based on a quality management system certified by the TÜV in accordance with ISO 9001.

Compliance with the new EC Machinery Directive and other relevant guidelines and standards guarantees product safety.

Our service and support also brings benefits – our calibration network is certified worldwide and spare-part availability is guaranteed for a minimum of ten years.

2 The perfect system for your individual testing requirements - the new Allround-Line

For all applications

The new Allround-Line is suitable for applications from all fields; it is equally ideal for quality-control testing and for demanding research projects. Allround-Line testing machines are available with a force range starting from 5 kN and, depending on requirements and force range, in flatbed or column configuration.

Maximum precision

Patented hollow-profile or classical column guides guarantee maximum stiffness and precise crosshead guidance, providing a basis for accurate, traceable test results. The core of the Allround-Line is the new *testControl II* control electronics, the new benchmark in digital measurement and control technology for testing machines.

Perfect harmony

The perfect interaction of the new Allround-Line's component parts is impressive; the combination of load frame, electronics and accessories ensures reliable test results. All components have been developed in-house at Zwick – drawing on all our experience from over 150 years of materials testing.

Unique flexibility

The modular 'building block' approach to mechanical components, software and electronics guarantees a cost-effective machine configuration tailored to the customer's needs. Two test areas and connection options for additional measuring systems ensure that the testing system is both flexible and future-proof. All load frames are available in various sizes (height, width) as standard.



Fig. 1: The Allround-Line is available in various sizes, with a force range starting from 5 kN



Operator convenience and innovative load-frame design

The new Allround-Line heralds a new era of operator-friendliness and adaptability for materials testing machines. The machines can be adjusted to suit the operator's needs, while their modular design allows adaptation as and when required.



Innovative electronics

The new *testControl II* measurement and control electronics offer impressive drive technology and modularity, providing the ideal basis for precise, error-free test results.



Maximum safety levels

The Allround-Line guarantees a high level of safety for user, test results, specimen material and testing system. Only the latest safety technology is employed, together with proven industrial components in accordance with ISO/IEC 60947. All testing systems comply with the EC Machinery Directive.



Future-proof

Modular design means that the testing system can be re-equipped or upgraded whenever required. Moreover, the *testControl II* control electronics are compatible with the future Zwick software generation, with spare-part availability guaranteed for at least 10 years after a product has been discontinued.

3 New standards in operator convenience

Everything under control

The entire test can be performed independently of the PC via the display-equipped remote control. It is also possible to control the machine directly through the electronics or via the software interface.

Full support

Our leading testing software *testXpert*® II provides support for the user during set-up, performance, evaluation and documentation. Experience gained from 20,000 successful installations speaks for itself.

Flexible and adaptable

The Allround-Line's flexibility allows it to be adapted to meet all requirements. Height-adjustable test areas enable the test environment to be tailored to individual needs, while the intelligent plug and T-slot system facilitates rapid component change to accommodate differing testing situations.



Fig. 1: The Allround-Line's flexibility allows it to cater for individual operator requirements

Ergonomic operating concept



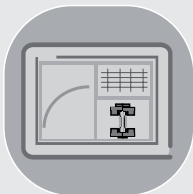
Remote control

Measurement channels and machine and test status are shown on the display. The machine can also be controlled directly through the electronics or via the software interface.



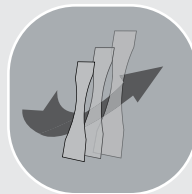
Operating-mode selector-switch

The lockable operating-mode selector-switch enables a clear separation between set-up and test modes.



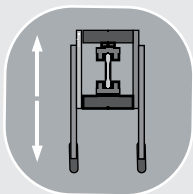
testXpert® II testing software

The software provides support for the user throughout the test. Functions such as automatic sensor identification or the intelligent tutorial and help concept simplify testing.



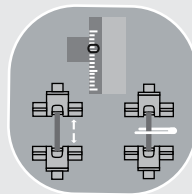
Reduced cycle times

Achieved through fast return speeds, performance of the entire test directly on the machine and real-time test-result evaluation.



Operator ergonomics

The highly ergonomic design is wheelchair-friendly, with flexible working height and low base-crosshead height.



Test environment concept

All relevant machines and safety settings, such as fixture separations or sensor configurations, undergo direct, one-time assignment to the test programs as test environments.

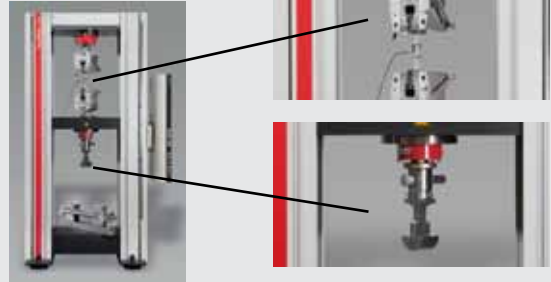
4 Innovative load frame design

Mechanical modularity



The flexible plug and slot system allows specimen grips and test fixtures to be changed whenever required, enabling a wide range of tests to be performed with the same testing machine.

Two test areas



Flexible test arrangements eliminate the need for fixture change, maintaining result reproducibility and making the acquisition of a second testing machine unnecessary. Only one load cell is required for the entire testing system.

Load frame with hollow profile + precision guidance



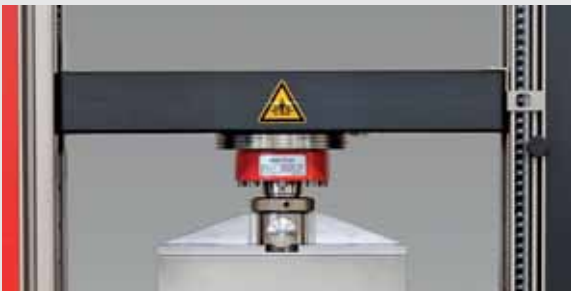
The table-top testing machines are equipped with a patented, flexurally stiff hollow profile with guide-cylinder. Long guides with generous surface areas ensure high-precision crosshead guidance, while T-slots incorporated into the profile provide flexible mounting options.

Xforce load cells



Possessing excellent resistance to overloads, the patented Xforce load cells are exclusively available from Zwick and also offer outstanding accuracy and high resistance to parasitic influences.

High stiffness



Generous connecting surfaces and ruggedly dimensioned components ensure high machine stiffness. The combination of this plus precision crosshead guidance ensures that unacceptable mechanical influences on the specimen are minimized.

Drive and motor technology



The Allround-Line is equipped with an extremely robust transmission system and features maintenance-free, digitally-controlled AC drive technology. The Hiperface® motor feedback system guarantees maximum crosshead travel resolution.

5 Innovative electronics

New standards

testControl II sets new standards for accuracy, control and logging rate – and for drive speed. Machines have high positioning and return speeds, while the additional fast return guarantees short cycle times.

Flexible connection options

Eight slots allow additional sensors and measuring instruments to be connected to *testControl* II as and when required. Plug-in modules, such as the digital measured-value logging card and 2,000 Hz measured-value transfer, enable the modular system to adapt to existing testing requirements.

Made by Zwick

testControl II is 'made by Zwick', with all development and production work taking place in Ulm, allowing optimum matching of all components and enabling Zwick to provide the best possible support. In developing *testControl* II Zwick was able to draw on the experience gained from over 12,000 installations of *testControl* electronics.



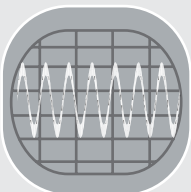
Fig. 1: *testControl* II sets new standards in measurement and control technology for testing machines

High measuring accuracy and reproducibility



Maximum accuracy

High (24-bit) resolution and A/D converter with 400 kHz sampling rate for maximum measured-value accuracy combined with large measurement range.



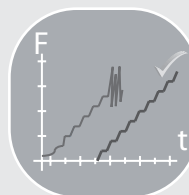
High measured-value rate

Synchronous 2 kHz measured-value logging-rate delivers fast measurement with maximum reproducibility (regardless of number of measurement channels).



AC drives

The powerful maintenance-free AC drive also allows cyclic tests to be performed at maximum speed up to nominal load – with no waiting time between tests.



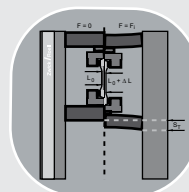
Adaptive controller

Automatic setting of all control parameters enables exact target-position approach. Changes in specimen properties are compensated for online.



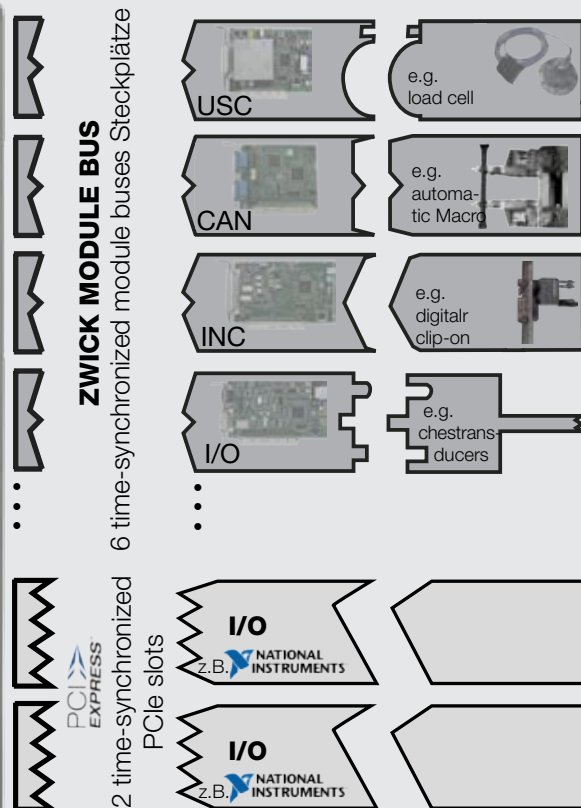
Strain-rate control

The drive technology's excellent constant-velocity characteristics and interaction with the sensor technology and adaptive control make it ideal for demanding strain-rate control (e.g. ISO 6892-1, Method A1).



Machine compliance correction

testXpert® II automatically determines the optimum curve, ensuring maximum possible accuracy for travel-measurement and positioning via the crosshead displacement transducer.



8 slots in the system

- Modularity for high level of flexibility
- easy integration of external load cells, displacement transducers and bridges via intelligent sensor concept
- open, standardized interfaces and state-of-the-art hardware architecture make *testControl II* a secure, future-proof investment
- drive controller digitally actuated via EtherCAT plus fast control frequency for rapid control and maximum speed constancy
- time-synchronous signal processing
- Special controller set-up can be used for testing situations with demanding control requirements

Display-equipped remote control for *testControl II*



- Can be operated with one hand and used as a remote control or operating panel
- Fast, high-precision machine positioning via rocker-switch with integral jog-wheel
- Remote control has specified functions, including Start/Stop, Move to Start Position and Open/Close Grips, while all enabled standard actions can be activated by *testXpert® II* via the freely programmable keys
- Measurement channels, machine and test status and keypad assignments are shown via the graphic display



Fig. 1: The Zwick safety concept guarantees protection for user, specimen, test data and testing system

6 100% safety for you and the entire testing system

Built-in safety concept

The interaction of the electronic and mechanical safety components and the software-based safety system guarantees maximum protection for user, specimens, test data and testing system.

The 2-channel safety circuit, including Emergency STOP, crosshead end-stop switches, interlinked accessories, and operating-mode selector-switch, provides enhanced safety during set-up, while the CE-compliant electrically interlocked safety device prevents access to the machines during testing. Naturally we only use approved components which conform to the highest safety and industrial standards (ISO/IEC 60947, ...).

Application-specific safety equipment

Zwick will provide you with expert advice on the best possible safety solution for your application. In addition you will receive a comprehensive safety briefing individually tailored to your testing system, offering you 100% safety for the system.

State-of-the-art technology in *testControl II* provides reliable protection for user, specimen, test data and testing system



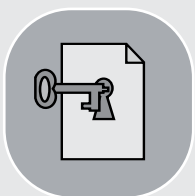
User safety

Intelligent safety functions, industrial safety technology, selectable operating modes and compliance with the new EC Machinery Directive – all combined to ensure maximum protection for the user.



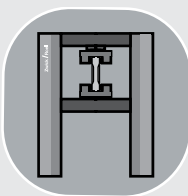
Specimen safety

Active sensor monitoring, force limitation during set-up mode plus intelligent force-increase detection and force control in *testXpert® II* guard the specimen against unacceptable overloads.



Data safety

testXpert® II guarantees maximum security for user data and test results. Protection against manipulation is ensured by intelligent user management, comprehensive access management and the 'Expanded Traceability' function.



System safety

The intelligent sensor identification system in combination with the test environment concept prevents damage to the testing system due to limit values being exceeded. In addition the new system monitor enables total supervision of key system status indications and offers preventive advice.

Flexible and future-proof – universal application and expandable as required



Sensors

Additional sensors such as measurement amplifiers, bridges etc. can be integrated as and when required.



Data links

Every type of database connection is supported, regardless of how test specifications and results are managed.



Multimedia

Both webcams and high-speed cameras can be connected. Test results can also be displayed on smart phones.



Temperature/media

The Allround-Line can be expanded with temperature chambers, high-temperature furnaces or water-baths whenever required.



Automation

A robotic system can be attached to the testing machine at any time, offering an even more cost-efficient test sequence.



Test fixture

The testing system can be expanded with fixtures/specimen grips from Zwick or the customer's own devices.

You can rely on the new Allround-Line with *testControl II*

...Zwick has over 30 years' experience of intelligent measurement and control technology

...more than 50,000 testing systems installed worldwide

...over 50 software developers and engineers working continuously on new functions

...spare parts available for a minimum of ten years even after products have been discontinued

...more than ten Zwick representatives actively involved in international standards committees

...Zwick service and support partners in over 50 countries are waiting to meet your on-the-spot requirements

With the new Allround-Line you are helping the environment as well as investing in a technological future - the Zwick-built AC drive uses significantly less energy than comparable models. Moreover, *testControl II* switches to eco mode when not in use, saving additional energy.

**Would you like to find out what benefits Allround-Line with *testControl II* has to offer you?
Our staff are at your service worldwide.**

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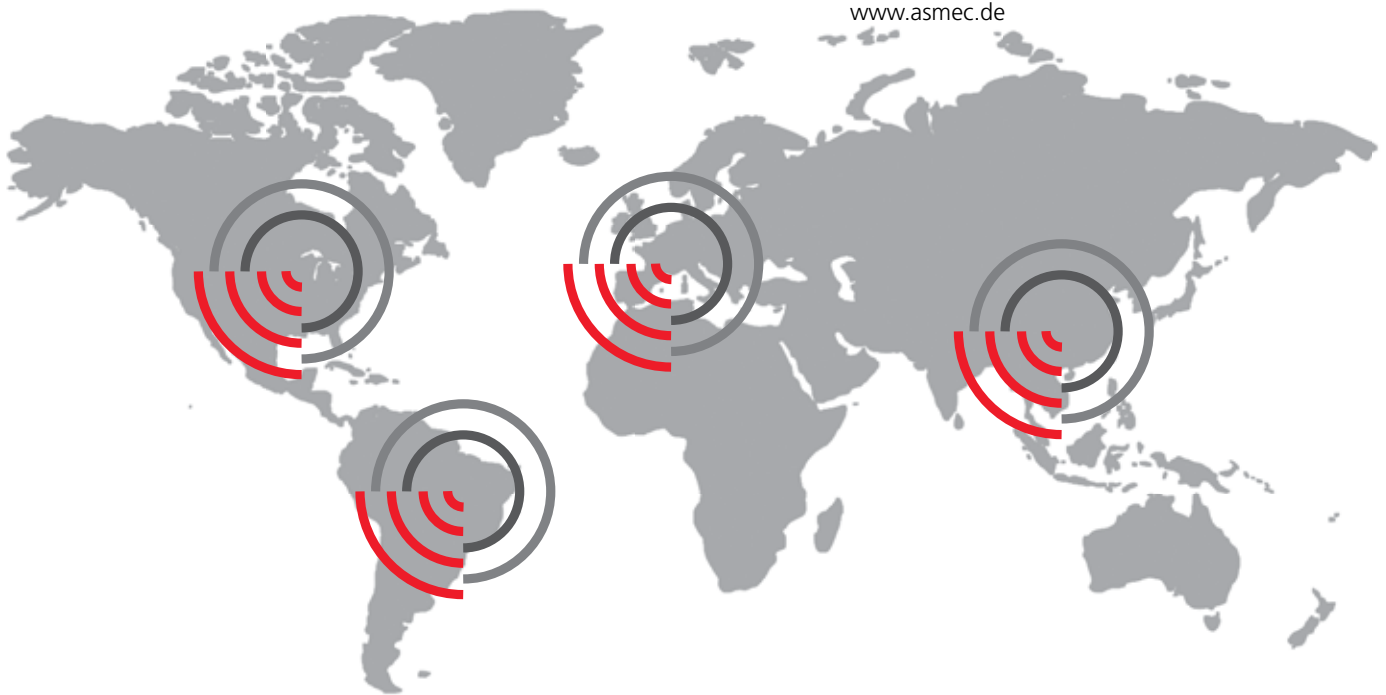
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