… from development to implementation

Labor Tech®

Czech manufacturer of material test equipment and automation

Dynamic servo-hydraulic biaxial testing machines

H.11 series – LabTest 6.250H.11

… from development to implementation

Production of materials testing equipment and automation

Testing machines for BIAXIAL testing of materials

Compact and reliable test systems for development…

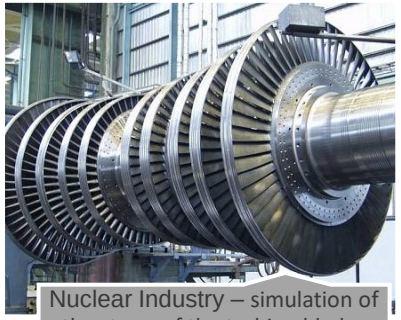
Biaxial machine - the H.11 series system from LABORTECH enables test engineers to simulate real and demanding conditions on samples. This device can stress the sample in several directions at once with any coefficient of load asymmetry and at the same time guarantees test engineers to have 100% control over this process.

The LabTest H.11 series servohydraulic test system provides a complete spectrum of static and dynamic planar biaxial testing of material stress, high cycle fatigue, material crack growth and environmental simulation on various types of materials. These are mainly the aerospace, automotive and nuclear industries and the development of wind turbine blades.

Aviation industry– inspection of blade turbines in aircraft engines and inspection of cockpits.

Automotive industry – multi-axis stress on the car body under extreme conditions

Wind power plant– testing of wind turbine blades in dynamic mode.



Nuclear Industry – simulation of the stress of the turbine blades driving a generator producing electricity.

For all modifications of the biaxial test systems LABORTECH H.11 produced by us, the mechanical and hydraulic parts can be combined modularly using any additional accessories. Many optional functions allow you to perform both static and dynamic tests in one or more X and Y axes, both positional and force loops, and to meaningfully and efficiently simulate and test special materials and components in various modes.

Intuitive and trouble-free use of test software designed for biaxial tests DYNAMIC and BENTROD produced by LABORTECH will guarantee you a reliable declaration of results and, above all, continuous data collection from all X and Y during continuous testing.

… from development to implementation

Production of materials testing equipment and automation

Inseparable main parts of the system H.11

Stiffness, accuracy, co-axiality and durability are the parameters in the standard

LabTest H.11 hydraulic biaxial testing machines consist of the following components, which are interconnected both physically and software and are an integral part of the entire testing system.

Machine test frame including accesories

Vertical stand frame design characterized by extremely high lateral rigidity, resonant and mechanical resistance in dynamic mode for each test axis of the machine.

Hydraulic compact unit

The hydraulic unit is designed as a compact for fatigue tests system with water cooling. Energy saving axial pump…. Diagnostic with system status monitoring …

Measuring and control electronics

The compact electronics of the EDCi Control - BIAXIAL series are preferably designed to handle this top application. Synchronization of all measuring and control channels with sampling frequency 10kHz in real time…

Software Dynpack - modul – Biaxial test

Intelligent software designed for static and dynamic applications including biaxial module, command from a file module or long-term storage of all data, etc.

Settings and machine inspection

BENTROD measuring and setting unit designed for evaluation and optimization of concentric and edge alignment correction according to ASTM E1012 and optical control and measuring system EOX-BIAXIAL…

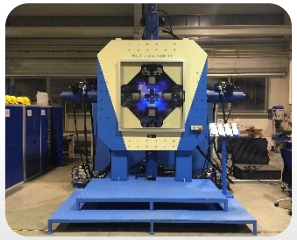
… from development to implementation

Labor Tech®

Production of materials testing equipment and automation

Test frame of the machine, including special accessories

There is no other machine with higer rigidity in our product portfolio…



Vertical stand frame design characterized by extremely high lateral rigidity, resonant and mechanical resistance in dynamic mode for each test axis of the machine.

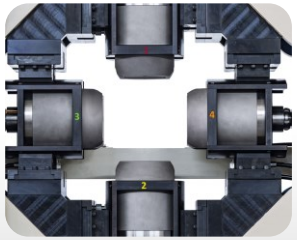
Mechanical and hydraulic protection of the actuators against impact in all axes.

The system is designed with an adjustable CEDEROD balancing and centering device in the load path, including a force sensor for each axis.

Special pneumatic damping system enabling the elimination of vibrations with an efficiency higher than 95%.

The actuators - drives - hydraulic servo cylinders X and Y are arranged at 90° right angles in one plane from the front view. Actuators with a stroke of +/- 50 mm (total stroke 120 mm) used in the frame are specially designed for surface biaxial testing with a small internal volume of oil to increase the rigidity of the system. The hydrostatic bearings of each drive with minimal friction allow to guarantee the testing the appropriate rigidity and co-axiality.

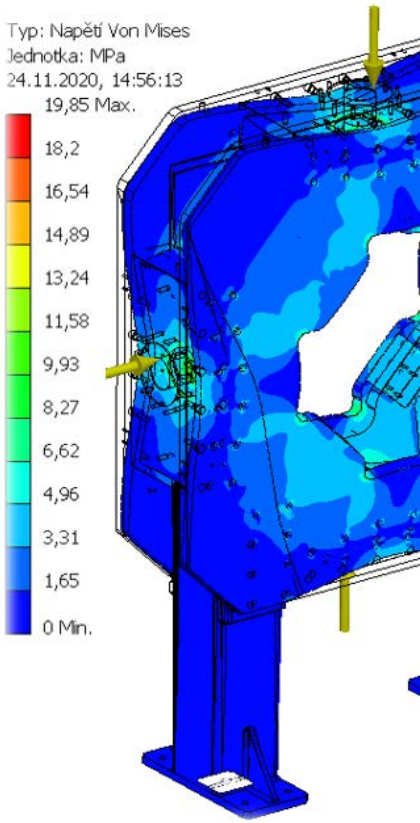
Integrated acceleration compensation and moment of inertia elimination for high-frequency testing for each axis separately.



In the load axis there are special wedge dynamic jaws with hydraulic pressure and integrated adjustable cage eliminating rotation, deflection of the entire axis with the possibility of precise setting of the required tolerance and mechanical stop.

The hydraulic grips include 4 pairs of flat inserts with a pyramid surface, special centering on a pin, clamping surface 110 x 110 mm, dimensioned for a maximum load of 1300N / mm².

System for central control of hydraulic grips on individual axes with monitoring of force increase during sample clamping and monitoring of clamping center.

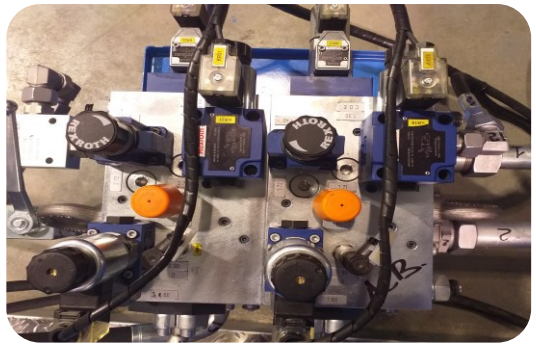


Labor Tech®

Production of materials testing equipment and automation

Hydraulic compact unit REXROTH

The harmony of pressures and flows defines the accuracy and reliability of the system…



Efficiency comes first

The hydraulic unit is designed as a compact hydraulic system designed for fatigue tests with water cooling. All these parts are located on a steel welded tank with a collecting tank.

The energy-saving variable displacement axial pump ensures maximum efficiency of the hydraulic system and regulates the flow of the supplied medium as required.

HAD has a G500Q4 system for controlling hydraulic jaws. Pressure circuit 450 bar with pressure transducer, for 4 jaws, throttle valves, manual pressure valves, etc.

System diagnostics and control

The Rittal central control panel is equipped with the HALT 18 - Diagnostic control system with system monitoring of states, pressures and Hydraulic unit service intervals consisting of SIEMENS SIMATIC electronics. The message is displayed on the SIEMENS touch LCD display. This system allows you to perform remote diagnostics from the control room, office or even a mobile phone.

Automatic interlocks protect against unintentional damage due to high temperature or high / low fluid level or oil leakage from the system. For greater protection, adjustable user limits for monitoring various HA parameters are available.

Quiet, clean and compact design

Covering is done with a special anti-noise cover PAC 250 consisting of polyurethane panels with a guaranteed total noise HA - <72 dB. Easy access from the sides on all sides by means of quick couplings allows easy handling around the HA (filter change, oil change, etc.). Thanks to the force of the block suspension, the HA can be placed directly on the floor of the test room.

The connection between the HAD hydraulic unit and the machine frame is made using the VOSSFORM system, including the pressure test by REXROTH. Oil stains and gutters have no chance!

… from development to implementation

Labor Tech®

Production of materials testing equipment and automation

Measuring and control electronics,

Perfect machine control, stability of measured data and safety are our priorities…

The compact electronics of the EDCi Control - BIAXIAL series are preferably designed to handle this top application.

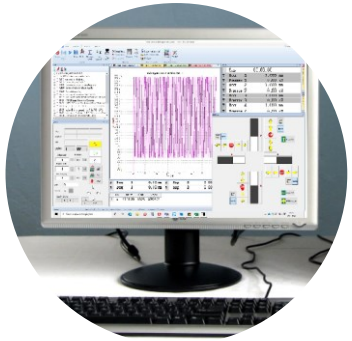
Synchronization of all measuring and control channels with a sampling frequency of 10 kHz in real time allows to control with overview all four axes of the biaxial machine LabTest 6.250 H.11..

Configuration and parameterization using the installation center computer software

Real-time synchronization of all measuring, control and feedback channels.

Resolution level of analog signals ± 250,000 divisions (20 ms). Internal frequency 64 bit, data acquisition 32 bit, AD 24 bit, arithmetic. Integrated RS232 for VIDEO extensometers. PC connection - Ethernet 10/100 Mbit, USB 2.0

Set of remote controls of the RMCi7 series with OLED display integrated CENTRAL STOP, control of individual grip on parameters for each axis separately, etc.



Powerful PC: Intel i5-4430 or higher, HD 240GB, OP 8 GB, Graphics: 1GB GDDR3 PCIe x16 NVIDIA, OS: MS Windows 10 Pro, 2x LCD monitor 24 "…

Emergency stop according to EN ISO 13850 - SIL 1 / PL c with monitoring or external power supply

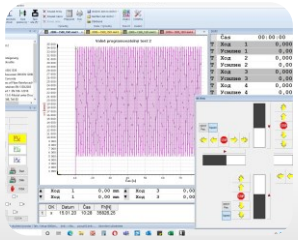
The safety corresponds to the European safety of machines CE directives (89/392 / EEC and 91/368 / EEC - safety of machinery EN60204-1: 1992). The emergency stop function electrically interrupts the drive of the hydraulic power unit and the entire machine. All safety systems are dual-circuit and fail-safe

… from development to implementation

Production of materials testing equipment and automation

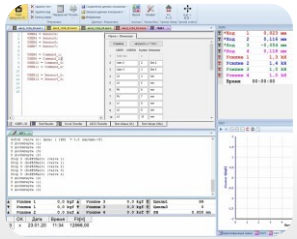
Software DYNPACK

Intuitive long-term exam software you'll love…

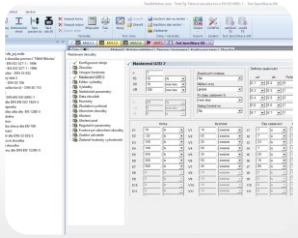


Software DYNAMIC features

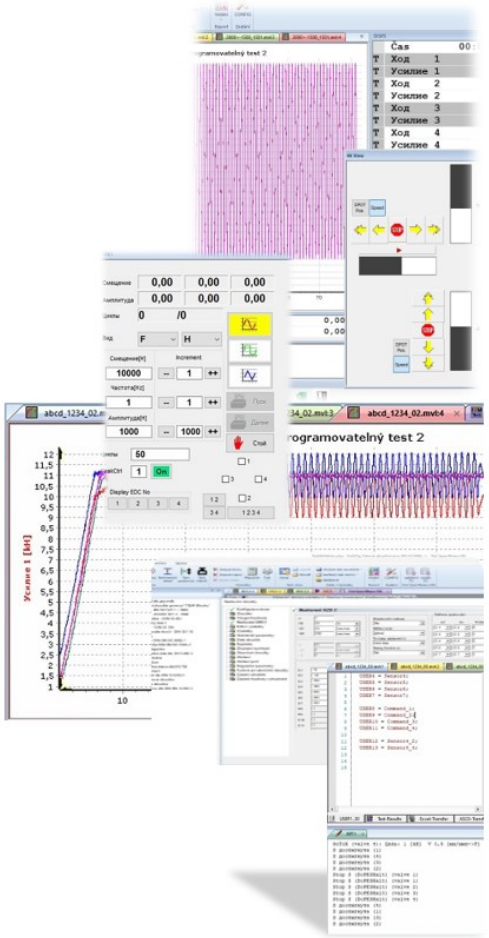
DYNAMIC - intelligent, intuitive and powerful software that will help you increase productivity and quality of testing in your test rooms and testing laboratories. You can streamline, improve, and accelerate the performance of your tests and adapt your test environment to make it easier for operators to measure the mechanical properties of tensile, bending, and torsional materials with support for EN, ISO, DIN, ASTM, and GOST standards.



- Unlimited number of test methods.
- Modular system of libraries designed for standardized tests
- to select for activation.
- Evaluation of optional parameters: maximum strength, strength, elongation, elongation, stress, 5 various reference points, etc ..
- Graph in real time, possibility of individual processing after the test
- Mass graphs, Zoom, serial testing - Data export to ASCII, EXCEL, WORD, Eclipse, Diadem, Q-DAS,
- Clamping length setting for each method
- Display of multiple quantities on the x, y axes



- Online display of up to 6 graphs with arbitrary quantities in the x, y axis
- Control of feed rate depending on elongation, force, stress, elongation, etc ..
- Software control of hydraulic and pneumatic jaws, temperature, automatic extensometer
- Receiving sample dimensions from peripheral devices
- Data collection from analog and digital external meters
- Setting user rights, operator login
- Custom setting of test results - Automatic saving of results according to the selected tree, database
- Statistical evaluation - 12 language mutations (Cs, En, De, Fr, Pl, It, Es, Ru, Nl, Tr, Zh, Pt)

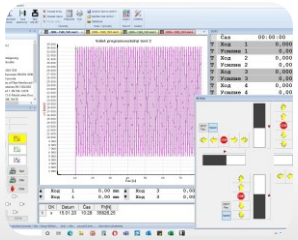


… from development to implementation

Production of materials testing equipment and automation

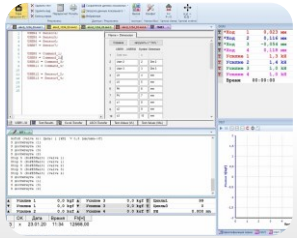
Software DYNPACK - MODULES

With our modules you can handle all your testing ideas…



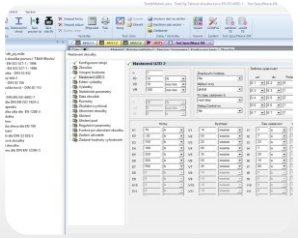
Module - Biaxial test

- Module for control of 4 control electronics of the EDCi series
- Free programming system - Setting up multiple axes, testing in multiple axes
- Commands: Position, sine, triangle, rectangle, stop, hold
- Offset, amplitude, frequency
- Choice of n-cycle storage, any number of steps, calculation, zeroing in different positions
- Conditional sequence of steps, messages during testing, definition of output values



Module- Commands from file

- Issuing half-amplitude sinusoidal commands
- Maintain the format identical to the commands of MTS and Instron machines
- Replenishment of units kgf.
- Command from file
- Different settings for X axis and Y axis „Level1x“ + „Level2x“ and „Level1y“ + „Level2y“
- Start the test in different directions – eg. the Y axis is in tension and the X axis is in pressure

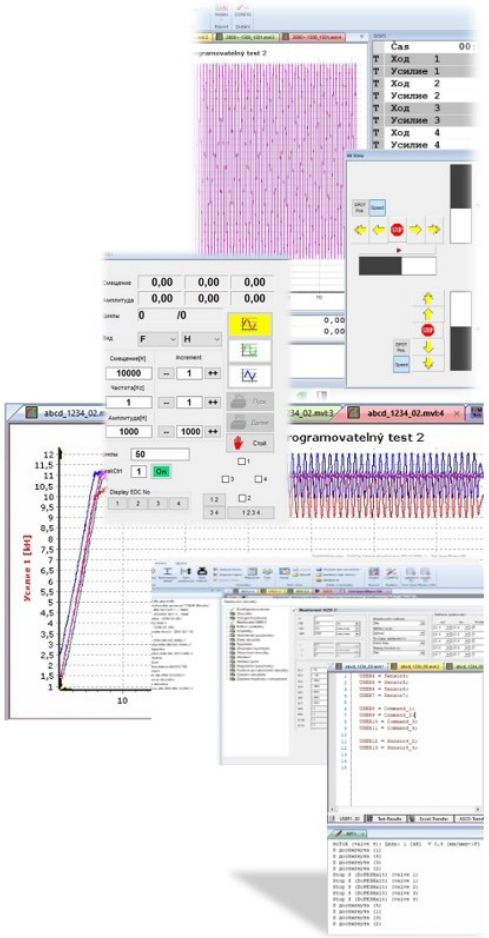


Module - long-term storage of all data

- Creation of a parallel thread (storage) for saving all data from all channels
- Maintenance of data storage with the possibility of restricting the data flow to display the overall test

Module for T&M - ME 5

- Determination: coefficients of normal anisotropy - r and exponent of strain hardening - n

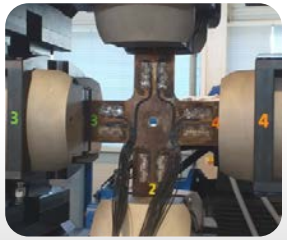


… from development to implementation

Production of materials testing equipment and automation

The BENTROD SYSTEM

A solution that can accurately and easily set up the X and Y system…

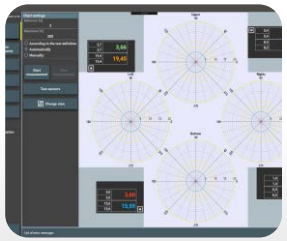


Measuring and setting unit BENTROD

LABORTECH biaxial load frames exhibit excellent rigidity and alignment, which minimizes bending stress to increase test accuracy and reduce data scatter. Proper alignment prevents off-axis bending stress, which can degrade the sample (acquisition and production of the sample is very expensive) or the resulting data will be skewed and therefore unusable. BENTROD measuring and setting unit designed for evaluation and optimization of concentric and edge correction of coaxiality (misalignment) of clamping jaws for static and dynamic testing machines according to ASTM E1012, GES400 (NADCAP), GE450 and ISO TC 164SC5WG11

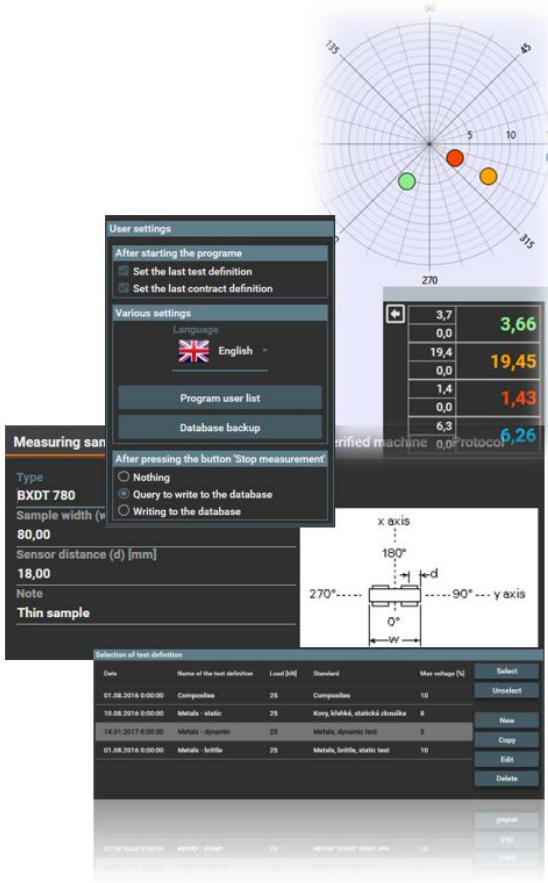
Centering fixture CEDEROD 250- Biaxial

Designed for initial alignment of 4 grips, control verification of alignment and adjustment after replacement of components of load hydraulic units. Maximum accuracy of processing and centering using precise center holes. Special adjusting cross made of material with temperature stabilization with a set of 64 semiconductor strain gauges for adjusting the X and Y axis. Adjustment in two axes, including the spherical surface, is performed using 8 Allen screws with fixation.



BENTRODTest – BIAXIAL

- Visualization of 3 levels using R, G, B points
- Choice of static or dynamic adjustment
- Definition of standards according to the type of test, predefined standards
- Adjustable graph scale: manual, automatic, database
- Database backup, Archive of measured values
- Print the setting log
- Integrated system calibration, etc.

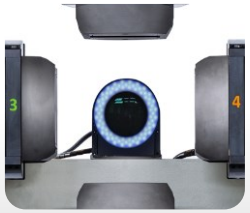


… from development to implementation

Production of materials testing equipment and automation

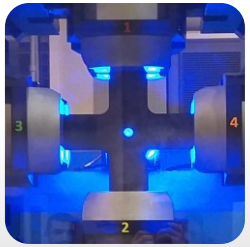
VIDEO Extensometr EOX

Can measure accurately, can pinpoint and can analyze well…



New advanced axial, transverse and biaxial video extensometer EOX using the latest digital image correlation technology thanks to a telecentric lens. This lens is a key component of the entire machine vision-driven measuring system: these lenses can truly take advantage of high-resolution detectors that capture images with exceptional fidelity, high accuracy and no optical distortion.

Special tripod - mechanical support system with fixed and safe mounting declares easy integration of the entire optical system into the biaxial machine.



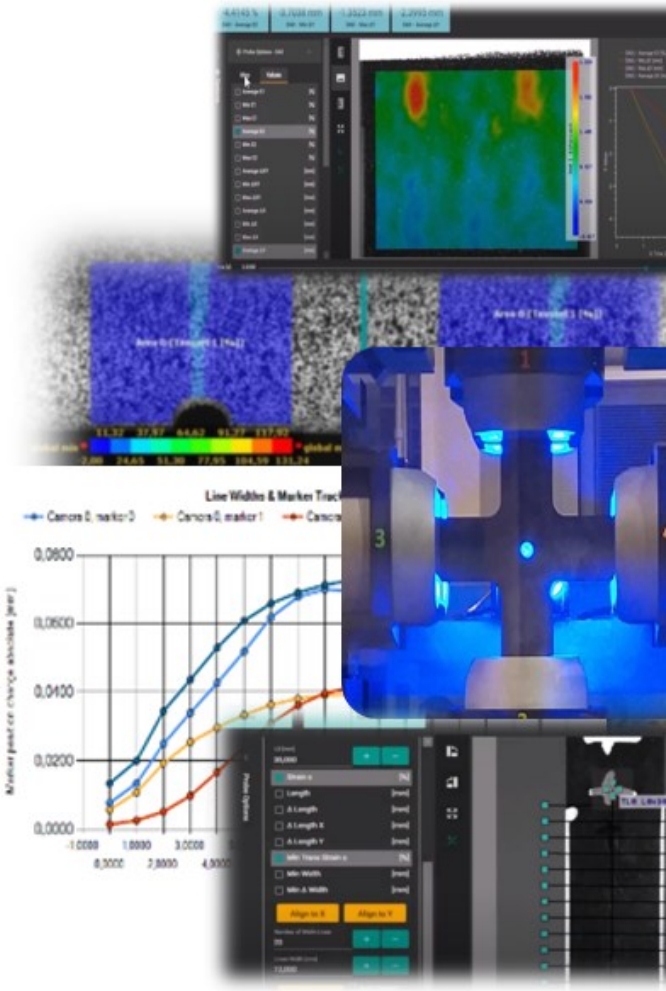
DYNAMIC ALFA Software

It is designed for voltage analysis and a user-friendly interface between the operator and complex mathematical operations processing digital images obtained from the EOX extensometer. You will love its simplicity and its advanced features will impress you.

Easy-to-manage calibrations, method presets associated with calibration, simultaneous measurements with multiple probes, a wide range of available outputs, a lockable administrator account, etc. These are just snippets of what the ALFA software can do.

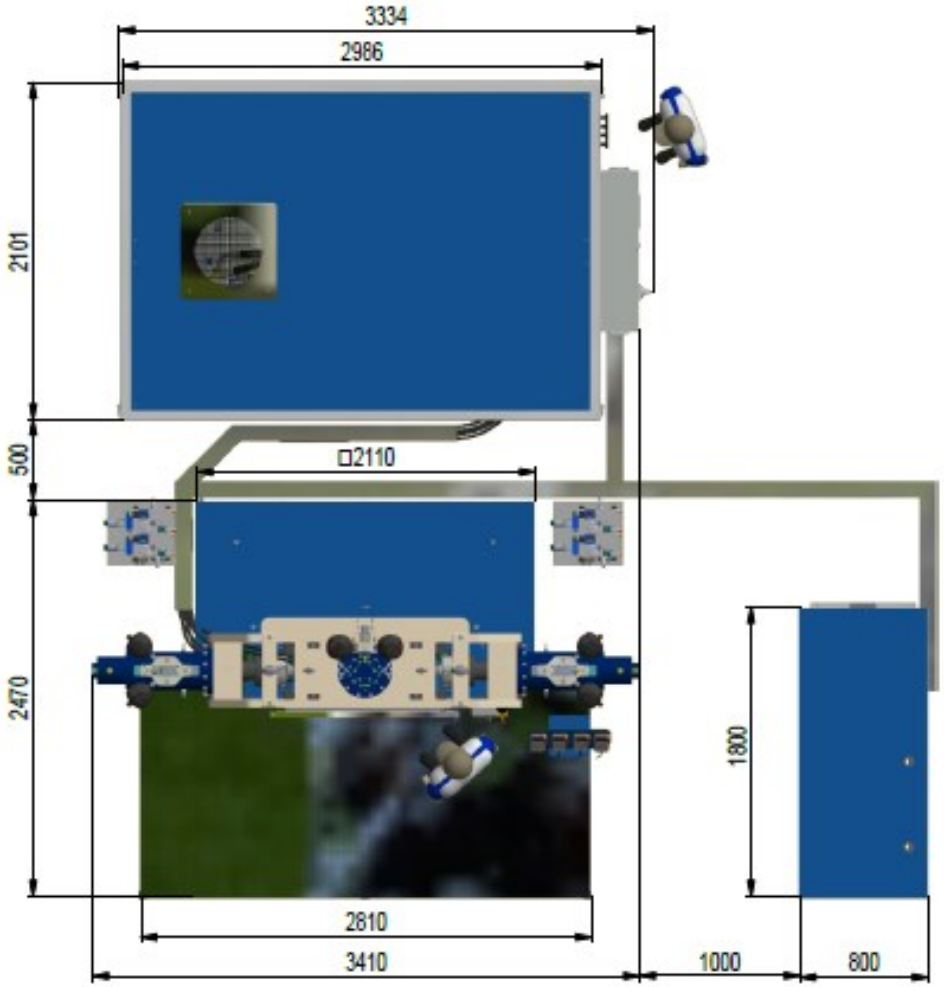
Basic features of EOX system

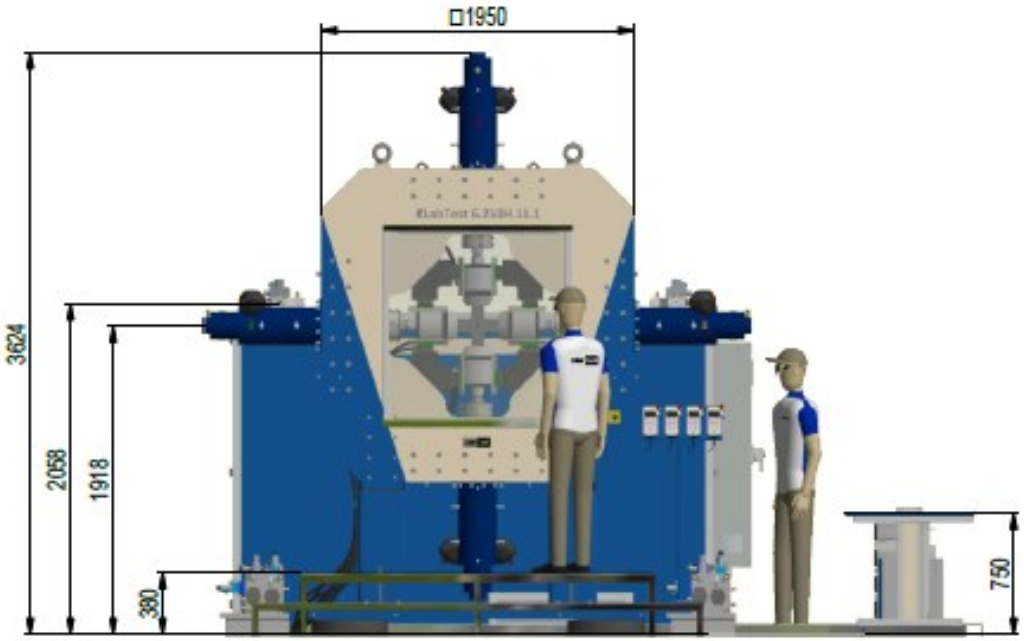
Camera resolution - 5 Mpx, pixel size - 3.45 µm, camera connection - C-Mount, sensor type - CMOS MONO, field of view - 51 x 51 mm in accuracy class 0.5, elongation error - 0.008% to 0.1 mm changes in working distance, interface - USB 3, class 0.5 -0.5um or 0.5%, max. sampling frequency - 73Hz, telecentrite better than 0.08 deg., distortion better than 0.04%



… from development to implementation

Production of materials testing equipment and automation





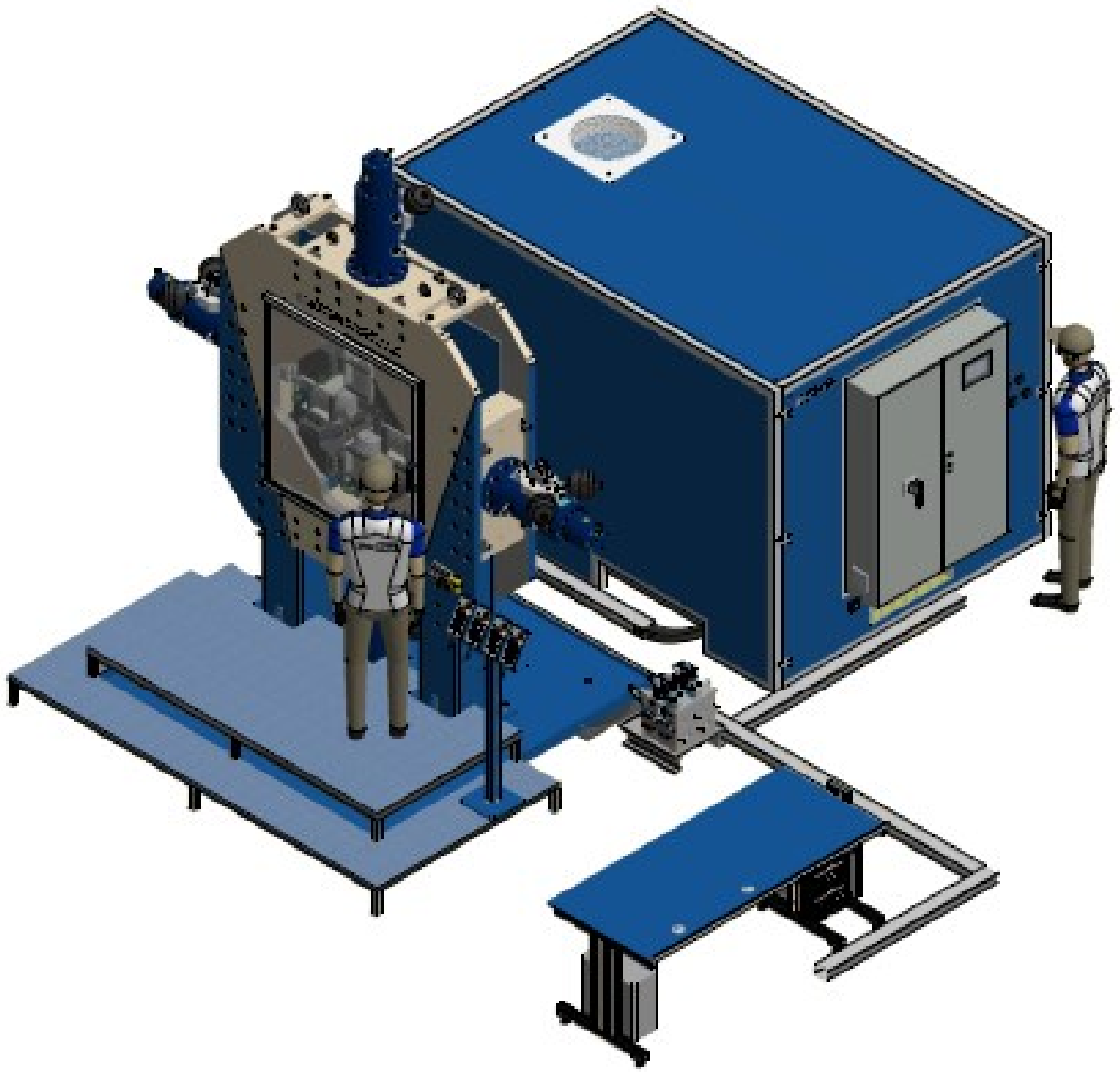
Technical changes reserved during development, machine parameters at room temperature.

11

… from development to implementation

Labor Tech®

Production of materials testing equipment and automation



H.11 series– BIAXIAL 250 kN

Technical data	Units	6.250H.11
Product code		1.08110419
Maximum load	kN	±250
Number of cylinders		4
Recommended test frequency to..	Hz	50
Stiffness of the machine at max. Force (without sensor)	kN/mm	9500
Strokes of hydraulic cylinders	mm	120
Measurement accuracy		
Accuracy class 1 - measurement from…	kN	0,75
Distance measurement resolution	µm	0,4
Distance measurement accuracy	mm	± 0,001
Machine dimensions		
Width of the workspace	mm	240
Height of the working space	mm	240
Hydraulic unit		
Oil tank capacity	dm³	1600
Working pressure on the cylinder	bar	280
Total oil flow in the system	l	260
Environmental conditions		
Working environment temperature	°C	+10 … +35
Storage temperature	°C	-25 … +55
Humidity of the working environment	%	<90
Electrical connection		
Supply voltage / frequency	V/Hz	400 / 50-60
Number of phases		3Ph/N/E
Power consumption	kVA	132kW
Others		
Machine weight	kg	7900
Color combination	RAL	1015, 5015

Technical changes reserved during development, machine parameters at room temperature.