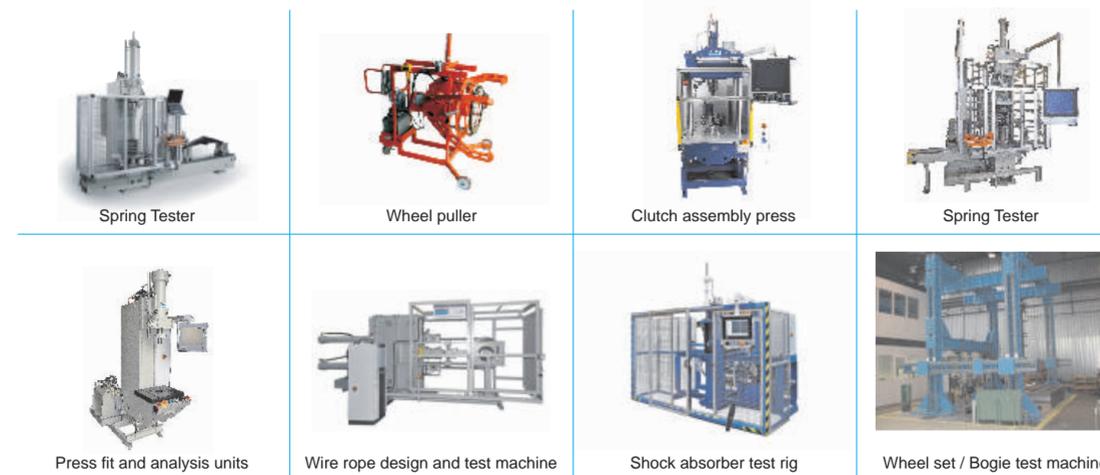


We are highly successful private limited company with over 50 years of engineering experience. Our Head Quarters are located in Austria, with subsidiaries throughout Central and Eastern Europe

Our core technology revolves around the design, production and marketing of high quality industrial solutions

- Press and jointing machines for production and test analysis
- Special hydraulic equipment and complex hydraulic systems
- Hydraulic components
- Industrial adhesives & sealants
- Speciality lubricants
- Conformal coatings and resins for electronic applications

Test equipment Universal Buffer Test Machine



Maximum press force	1000 kN
Minimum press force	100 kN
Cylinder stroke	550 mm
Width of opening Z	900 mm
Width of opening front Y	600 mm
Width of opening side X	500 mm
Test object carrier height	700 mm

Test object carrier Dims.	400x600 mm
Test speed	7-14 mm/s
Motor performance	15 kW
Load cell	100-1000 kN
Test object carrier on rollers	
Buffer loading option	left or right

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Process integrated analysis of energy absorption and Quality Control for rail buffers and rolling stock coupling systems

Railway buffers need to be regularly tested to ensure that the energy absorption characteristics are within the specified ranges. Test cycles are based on the OEM specifications, the National Railway Regulations and /or in accordance to the European Norm EN 15551- Annex D "(normative) Testing of static characteristics of buffers". The test run in accordance to this Norm requires the plotting of a force – distance curve during the entire press cycle. The test is carried out using a complete buffer system, i.e. the spring and shock absorber elements to be tested are fitted into a housing that correlates to the Norm.

The following types of springs can be fitted into the Buffer housing:

- Rubber and or other elastomeric springs systems
- Frictional dampers or annular springs
- Hydrodynamic and hydrostatic systems
- Parabolic and combined spring elements

The test normally consists of three press-cycles with a force-displacement curve plotted for each run. The spring characteristic curves have to lie within the pre-defined tolerances.

Cylinder speed during the press and return phase has to lie between 10 mm/s and 50 mm/s.

Following completion of the test run the difference between force applied and the energy absorption is calculated. All results with other selected data are then displayed on the PC screen in the form of a I.O. or N.I.O. rating, these results are saved in the PC and can also be directly printed onto a customer specific test protocol.

The test programme for each individual type of buffer can be pre-entered into the test machine and then re-called by entering the buffer type; the corresponding test cycle will then run automatically.

Brief description of the test cycle:

The operator drives the test object carrier out of the machine in order to allow the placement of the test object into the housing using a crane or other handling equipment. The operator then activates the machine by pressing the two handed operator console, the buffer is then automatically driven into the test position underneath the press cylinder. Test cycle runs automatically. The resulting force-displacement curves are displayed and evaluated. Once the test cycle is complete the test object is driven out of the test rig to the loading area for removal. The resulting customer specific test protocol shows the raw data i.e. the actual force / displacement results in numeric form as well as the "characteristic curve achieved" and the "characteristic curve required". In accordance to the buffer specification the final result is the I.O. or N.I.O. rating.

Main software control features

Display of stroke / force curve

Calculation of force applied and energy absorption

Customer can create and modify own Test Protocol layout

I.O. / N.I.O. Anzeige

Result of press, ie N.I.O. or I.O. displayed on control screen

Entry and saving of operator information and contract number

Programme memory capable of multiple spring types

Programme call up via contract No. or the type of buffer

All relevant process data presented on an open (editable) user friendly screen layout test result, operator, date, time, test info and contract No. displayed & recorded following every test run. All system relevant data (numerical and graphical) is registered and automatically archived on the P.C's hard drive

Statistical analysis optional

Memo fields can be integrated upon request

ULBRICH		PROTOCOL		Sequential serial number	
		Test via PPM 1000 kN Buffer Tester Machine No. Ulbrich 71194		10355	
Contract Number.: P-2012_045		Protocol description: Miner S-110_SerNr_3		Test date : 14.02.2012	
Series number of buffer: V-854883					
Description	Press depth [mm]	Tolerance		Unit Value [kN]	Result
		Min.	Max.		
H0[mm]		647	653	650,1	OK
F1 [kN]	25	10	40	22,2	OK
F2 [kN]	60	50	150	78,8	OK
F3 [kN]	105	300	1000	554,9	OK
F4 [kN]					
F5 [kN]					
F6 [kN]					
We [kJ]		≥ 10kJ		15	OK
Wa[kJ]		≥ 0,5 We		8	OK

Force / Press depth - diagram	
Force [kN]	Press depth [mm]
800	120
700	100
600	80
500	60
400	40
300	20
200	0
100	0
0	0

Operator: Kevin Smith	Signature:
Test result: GOOD	
Test Norm : UIC 528 / EN 15551:2009+A1:2010	
Quality control :	Signature:

ULBRICH

PPM - 1000 kN Universal Buffer Test Machine

Fully integrated high resolution distance measurement and control

Hydraulic block with high precision proportional valves

Guiding cylinders prevent rotation during press stroke

Robust high precision load cell

Low noise level hydraulic drive unit with oil contamination, oil level and operational temperature control. Warning information displayed on the control screen.

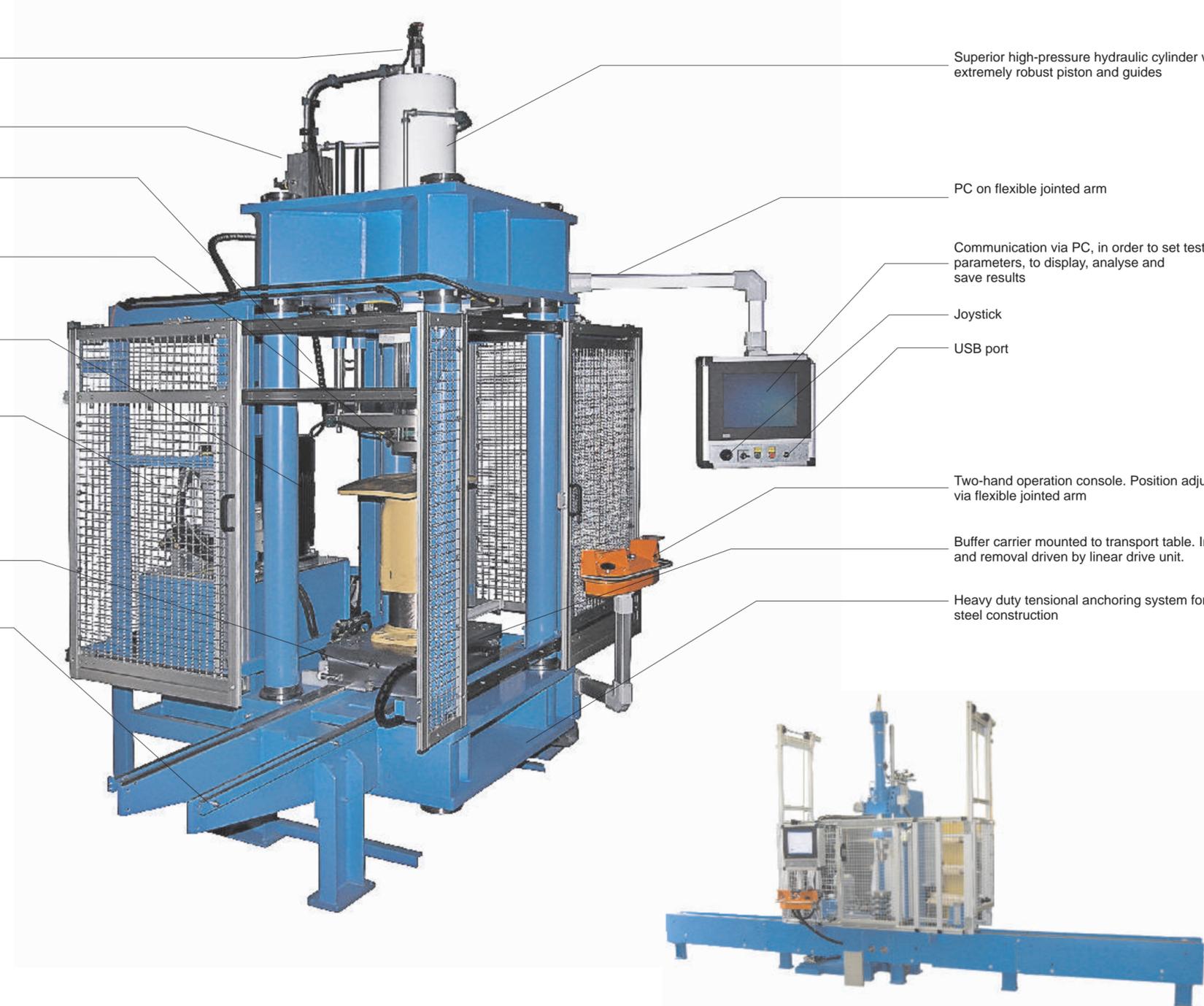
Protective housing door on slides with safety switch

Test object carrier mounted on rollers for ease of placement / removal

External loading area externally allows for easier handling via crane or forklift truck. (Customer can specify left-side or right-side)



Spring and shock absorber test machine



Superior high-pressure hydraulic cylinder with extremely robust piston and guides

PC on flexible jointed arm

Communication via PC, in order to set test parameters, to display, analyse and save results

Joystick

USB port

Two-hand operation console. Position adjustable via flexible jointed arm

Buffer carrier mounted to transport table. Insertion and removal driven by linear drive unit.

Heavy duty tensional anchoring system for the steel construction

Spring Tester