WP 310
Materials testing, 50kN

The illustration shows WP 310 together with the accessory WP 310.05.

Learning objectives/experiments

- together with the accessories
  - tensile test
  - compression test
  - Brinell hardness test
  - bending test
  - shear test
  - cupping test
  - spring testing

Description

- **hydraulically operated trainer, based on industrial standards**
- **direct generation of tensile and compressive forces**
- **extensive accessories for experiments from destructive materials testing**

A classic discipline of materials testing is the destructive testing method, in which specimens are mechanically tested to failure. The materials test provides data for hardness, rigidity and strength in a reproducible and precisely quantified manner.

The WP 310 unit, in conjunction with the accessories, offers experiments from destructive materials testing.

The clean layout and simple operation mean the experimental sequence can be observed in all details and phases. The power of the trainer allows tests to be performed on an industrial scale. Material specification data and laws can be verified using self-determined measured values.

The vertical, hydraulically operated trainer with direct force generation can produce both tensile and compressive forces. The height of the lower cross-member can be adjusted for coarse adjustment. Cylindrical receptacles on the cross-members allow for easy exchange of accessories.

The extensive accessories provide tensile and compression tests, Brinell hardness tests, bending, shear and cupping tests. Plate and coil springs can also be tested. The test load and elongation of the specimen are measured by sensors and are displayed.

The measured values are transmitted directly to a PC where they can be analysed using the software included.

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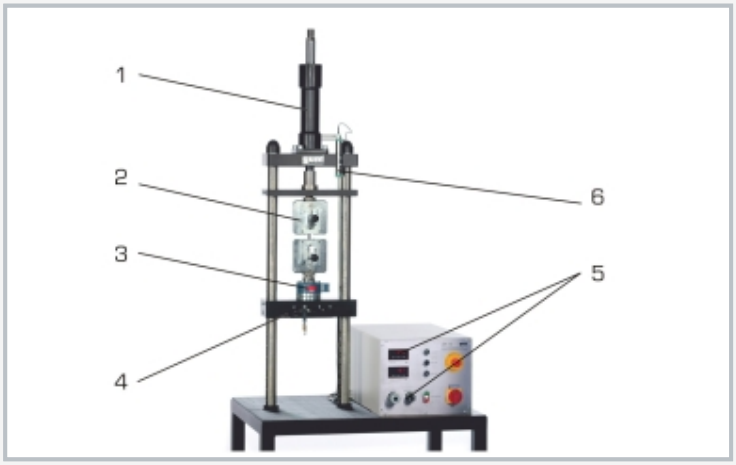
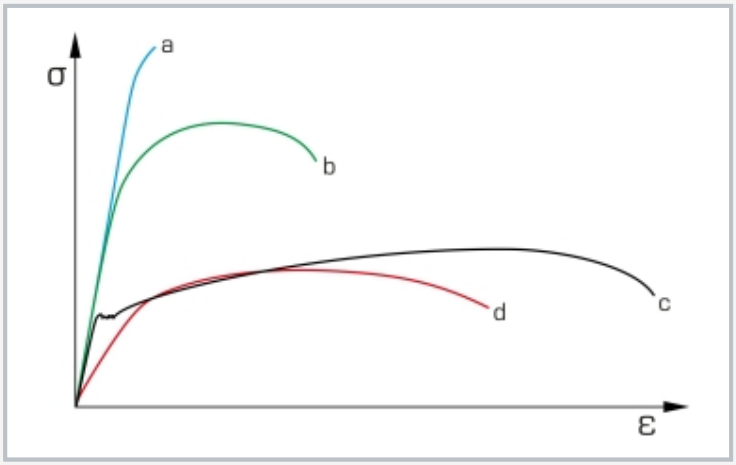
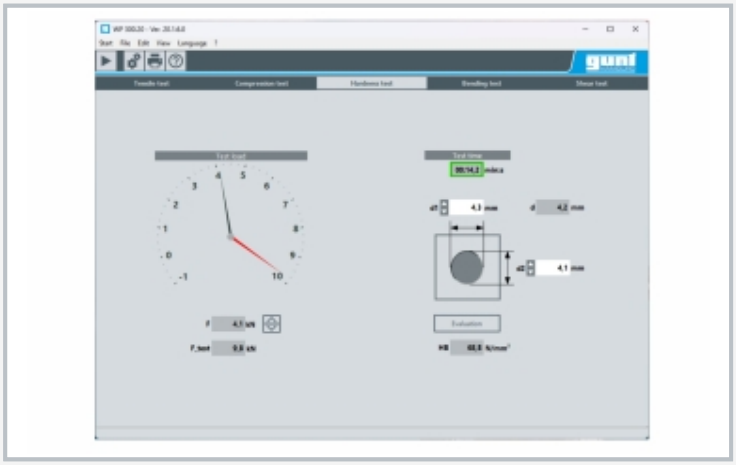


1 hydraulic cylinder for generating tensile and compressive forces, 2 operating area with the accessory WP 310.05, 3 force sensor, 4 adjustable height lower cross-member with lock, 5 displays and controls, 6 displacement sensor



Stress-strain diagram for various materials: a hardened steel, b tempered steel, c annealed steel, d alloyed aluminium



Software screenshot: Brinell hardness test

Specification

[1] hydraulically operated trainer for materials testing, based on industrial standards
[2] generation of tensile and compressive forces
[3] adjustable test load and travel velocity
[4] generation of test load via gear pump and double-acting hydraulic cylinder
[5] force measurement via a strain-gauge full bridge with acoustic overload signal, max. overload 150%
[6] displacement measurement via linear potentiometer
[7] LED displays for force and displacement with tare and maximum-value storage
[8] GUNT software for data acquisition via USB under Windows 11
[9] wide range of accessories available

Technical data

Operating area, WxH: 300x925mm
Hydraulic generation of the test load
- test load: 0...50kN
- max. system pressure: 175bar
- max. piston stroke: 150mm
- traverse velocity: 0...425mm/min
- gear pump
  - max. flow rate: 1cm^3/revolution
  - power consumption: 0,55kW

Measuring ranges
- force: 0...50kN
- displacement: 0...150mm

230V, 50Hz, 1 phase
230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase
UL/CSA optional
LxWxH: 1080x830x2300mm
Weight: approx. 330kg

Required for operation

PC with Windows recommended

Scope of delivery

1 trainer
1 GUNT software + USB cable
1 set of instructional material

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Optional accessories

Tensile test	
WP 310.05	Clamping device for tensile specimens, round and flat
WP 310.12	Set of 10 tensile specimens F10x50, St
or	
WP 310.06	Clamping device for tensile specimens, threaded end
WP 310.11	Set of 10 tensile specimens B10x50, St
or	
WP 310.07	Clamping device for tensile specimens, dumbbell-shaped
WP 310.13	Set of 10 tensile specimens, dumbbell-shaped, St
Compression test	
WP 310.04	Compression plates for compression tests
WP 310.15	Set of compression specimens, 4x plastic, 1x wood
Brinell hardness test	
WP 310.01	Experimental setup for Brinell hardness test
WP 300.03	Set of 4 hardness specimens, Al, Cu, St, CuZn
WP 300.31	Set of 4 hardness specimens, Al
WP 300.32	Set of 4 hardness specimens, Cu
WP 300.33	Set of 4 hardness specimens, St
WP 300.34	Set of 4 hardness specimens, CuZn
WP 300.12	Measuring magnifier for Brinell hardness test
Bending test	
WP 310.03	Bending test device
WP 310.81	Set of 25 bending specimens, St
Cupping test	
WP 310.10	Device for cupping tests
WP 300.41	Set of 5 cupping specimens, Al
WP 300.42	Set of 5 cupping specimens, Cu
WP 300.43	Set of 5 cupping specimens, St
WP 300.44	Set of 5 cupping specimens, CuZn
Shear test	
WP 310.02	Device for shear tests, double-shear
WP 300.52	Set of 5 shear specimens, Cu
Spring test	
WP 310.08	Experimental setup for spring test, helical spring
WP 310.09	Experimental setup for spring test, disk spring