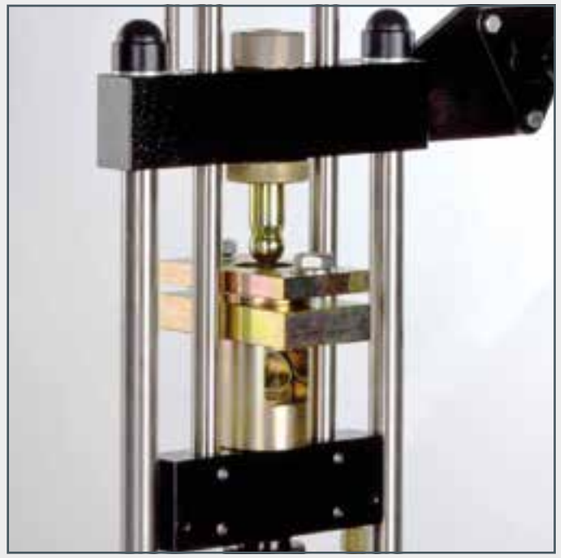
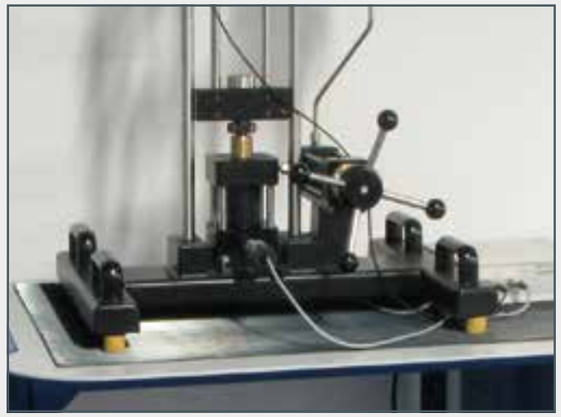
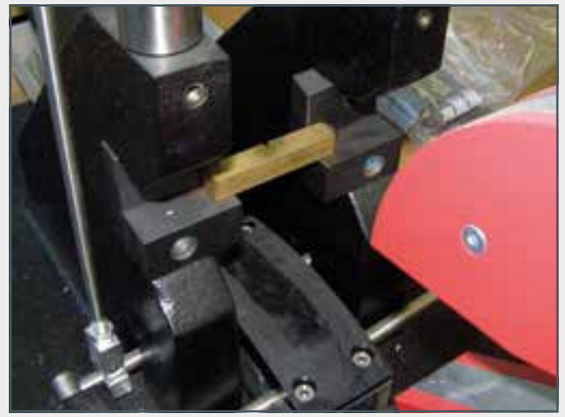
Course
Fundamentals of materials testing

Series WP

A complete course in the fundamentals of materials testing







Course
Fundamentals of materials testing

Using experimental units, students learn how to analyse materials by learning about different test methods for determining material properties and for assessing and classifying “unknown” materials.

The complete course includes topics such as:

- elastic and plastic deformation
- tensile strength, stress, strain, force-extension diagram, stress-strain diagram
- elongation at fracture, necking, fracture behaviour
- Brinell hardness test
- compression test, compression strength, compression yield stress, stress-compression diagram
- bending test
- cupping test, cold formability
- shear test, shear strength
- torsion test, torsion, shear stress, torsional stiffness, impact behaviour
- Charpy notched-bar impact test, toughness property, notched-bar-impact work-temperature diagram
- fatigue strength test, Wöhler diagram, analysis of the fracture surface
- creep rupture test, creep, strain-time diagram (creep curve)

The compact WP 300 experimental unit generates a 20 kN test load

- classic experiments from destructive materials testing
- observation of the experiment in all details and phases
- clear demonstration of relationships between rising forces and change in various materials
- mobile use thanks to compact and lightweight design
- preparation display and storage of data with the WP 300.20 system for data acquisition

The WP 310 experimental unit generates a 50 kN test load

- classic experiments from destructive materials testing with measuring results based on industrial standards
- trainer for experiments based on industrial standards
- acoustic overload signal for test loads
- the scope of delivery includes GUNT software for analysing the experimental data

The compact WP 400 experimental unit generates a 25 Nm work capacity

- Charpy notched-bar impact test for quality control and analysis of the fracture behaviour in metallic materials
- pendulum impact tester based on DIN EN ISO 148-1
- various safety devices for conducting experiments safely and optional protective cover for the WP 400.50 operating area
- preparation display and storage with the WP 400.20 system for data acquisition

The WP 410 experimental unit generates a 300 Nm work capacity

- Charpy notched-bar impact test with increased work capacity
- pendulum impact tester based on industrial standards / DIN EN ISO 148-1
- safe experiments thanks to two-hand release of the hammer and optional protective cage for pendulum impact tester WP 410.50
- preparation display and storage with the WP 410.20 system for data acquisition

The compact WP 500 experimental unit generates reference moments of 30 Nm

- generates the twisting moment by means of a worm gear
- measure the twisting moment with strain-gauge measuring shaft and encoder for measuring the twisting angle
- the scope of delivery includes GUNT software for analysing the measured values

The WP 510 experimental unit generates reference moments of 200 Nm

- torsion test based on industrial standards; experiments conducted with the aid of a motor
- different torsional velocities, clockwise and anticlockwise
- microprocessor-based measuring technology
- the scope of delivery includes GUNT software for analysing the experimental data

The compact WP 140 experimental unit is used to conduct fatigue strength tests

- fatigue strength of bars under reverse bending stress
- digital counter displays load cycles
- automatically shuts down when the test bar fractures
- preparation display and storage with the WP 140.20 system for data acquisition

The compact WP 600 experimental unit is used to conduct creep rupture tests

- simple creep rupture tests with lead and plastic specimens
- experiments can be conducted at room temperature
- cooling elements allow experiments to be conducted below room temperature
- experiments last from a few minutes to an hour

Course
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Accessories for various materials tests

WP 300, 20 kN test load

Tensile tests

WP 300.02 Set of 4 tensile specimens, Al, Cu, St, CuZn
WP 300.21 Set of 4 tensile specimens, Al
WP 300.22 Set of 4 tensile specimens, Cu
WP 300.23 Set of 4 tensile specimens, St
WP 300.24 Set of 4 tensile specimens, CuZn
WP 300.14 Clamping device for flat tensile specimens
WP 300.25 Set of 4 tensile specimens, flat, Al, Cu, St, CuZn

Compression tests

WP 300.05 Compression plates for compression tests, large
WP 300.70 Set of 4 compression specimens, gypsum
WP 300.71 Set of 4 compression specimens, wood
WP 300.72 Set of 4 compression specimens, plastic

Brinell hardness tests

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 tests

WP 300.04 Bending test device
WP 300.61 Set of 3 bending specimens, Al, St, CuZn

Cupping tests

WP 300.11 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 tests

WP 300.10 Device for shear tests, double-shear
WP 300.13 Device for shear test, single-shear
WP 300.52 Set of 5 shear specimens, Cu

Spring tests

WP 300.06 Experimental setup for spring test, helical spring, 2 sets
WP 300.07 Experimental setup for spring test, disk spring

WP 310, 50 kN test load

Tensile tests

WP 310.05 Clamping device for tensile specimens, round and flat
WP 310.12 Set of 10 tensile specimens F10x50 DIN 50125, St (S235JRC+C)
WP 310.06 Clamping device for tensile specimens, threaded end
WP 310.11 Set of 10 tensile specimens B10x50 DIN 50125 M16, St (S235JRC+C)
WP 310.07 Clamping device for tensile specimens, dumbbell-shaped
WP 310.13 Set of 10 tensile specimens, dumbbell-shaped, St (S235JRC+C)

Compression tests

WP 310.04 Compression plates for compression tests
WP 310.15 Set of compression specimens, 4x plastic, 1x wood

Brinell hardness tests

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 tests

WP 310.03 Bending test device
WP 310.81 Set of 25 bending specimens, St

Cupping tests

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 tests

WP 310.02 Device for shear tests, double-shear
WP 300.52 Set of 5 shear specimens, Cu

Spring tests

WP 310.08 Experimental setup for spring test, helical spring
WP 310.09 Experimental setup for spring test, disk spring

WP 400, 25 Nm test load

Impact test

WP 400.01 Set of 10 V specimens 10x5, construction steel
WP 400.02 Set of 10 V specimens 10x5, CuZn
WP 400.03 Set of 10 V specimens 10x10, CuZn
WP 400.04 Set of 10 U specimens 10x5, free cutting steel
WP 400.05 Set of 10 R7 specimens, free cutting steel
WP 400.06 Set of 10 R5 specimens, free cutting steel
WP 400.07 Set of 10 R7 specimens, heat treatable steel
WP 400.08 Set of 10 R7 specimens, construction steel
WP 400.09 Set of 10 V specimens, construction steel
WP 400.50 Safety cage for pendulum impact tester

WP 500, 30 Nm test load

Torsion test

WP 500.01 Set of 6 torsion specimens, St, Al, CuZn

Material fatigue with WP 140

Fatigue strength test

WP 140.01 Set of 3 specimens, various fillet radii, St

WP 410, 300 Nm test load

Impact test

WP 410.01 Set of 10 ISO-V specimens 10x10, St 37k
WP 410.02 Set of 10 ISO-V specimens 10x10, Cu
WP 410.03 Set of 10 ISO-V specimens 10x10, CuZn
WP 410.50 Safety cage for pendulum impact tester

WP 510, 200 Nm test load

Torsion test

WP 510.01 Set of 5 torsion specimens, St
WP 510.02 Set of 5 torsion specimens, CuZn
WP 510.03 Set of 5 torsion specimens, Al

Material fatigue with WP 600

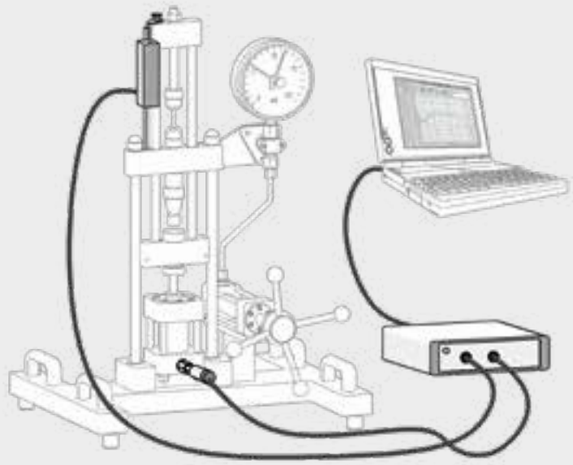
Creep rupture test

WP 600.01 Set of 10 specimens, PE
WP 600.02 Set of 10 specimens, Pb

Accessories

WP 300.09 Laboratory trolley

Systems for data acquisition



GUNT software

- supports various materials tests
- record typical diagrams, e.g. stress-strain diagram, notched bar impact work-temperature diagram
- complete test record according to DIN (tensile and compression test)
- prepare, display and store data
- in WP 140, WP 300, WP 400, WP 410 optionally available
- in WP 310, WP 500, WP 510 included in scope of delivery