

# MT 190

## Assembly materials tester



### Description

- kit of a unit for basic experiments in materials testing
- can be expanded with electronic data acquisition
- part of the GUNT-Practice Line for assembly, maintenance and repair

The MT 190 unit is supplied as a kit and contains all mechanical parts, measuring units, hydraulic components with seals and pipe material with all connecting parts. Assembly comprises the mechanical structure, the hydraulic assembly of both cylinders and the piping installation. All tools and aids required are included, as well as extensive teaching materials.

The MT 190.01 assembly set allows for data acquisition as an extension to the range of experiments. Using MT 190, students can learn about working on a complex project. This involves the planning, implementation and checking of processes related to assembly, commissioning and repair.

The assembled MT 190 experimental unit represents a real, fully functional materials tester that can be used to conduct tensile tests and Brinell hardness tests. The experimental unit has been developed specifically for experiments in small groups and is characterised by a clear design, simple operation and accessories that are easy to exchange.

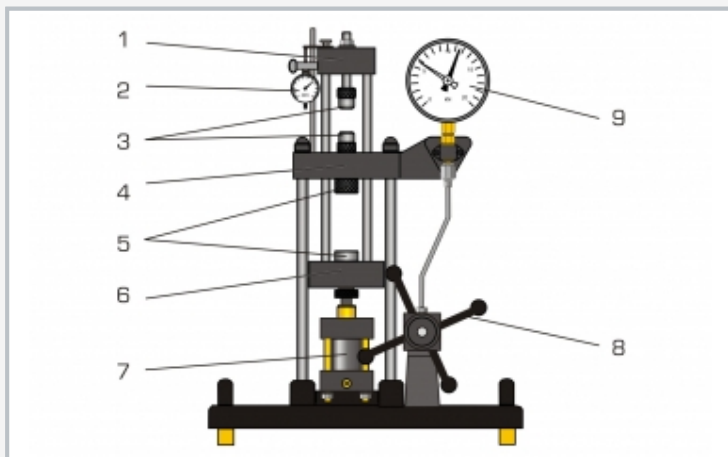
The tensile specimens are clamped between the upper cross member and the crosshead. The hardness specimens are secured between the crosshead and lower cross member. The test force is generated by means of a hand-operated hydraulic system and displayed on a large force gauge with a drag indicator. A dial gauge measures the elongation of the specimens.

### Learning objectives/experiments

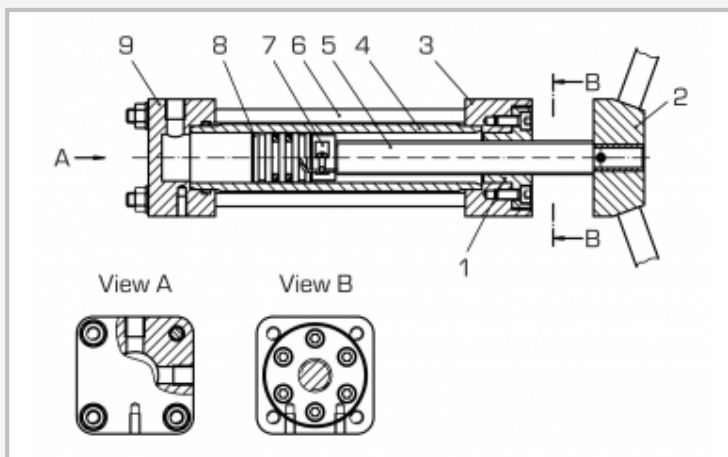
- read and understand technical documentation
- plan and execute assembly steps and sequences
- familiarisation with machine elements and components
- commission and inspect materials tester after successful assembly
- plan, implement and evaluate maintenance operations
- fault analysis: troubleshooting, fault analysis and remedy
- after successful assembly
  - ▶ tensile test on metallic specimens
  - ▶ plot load-extension diagrams
  - ▶ Brinell hardness test

# MT 190

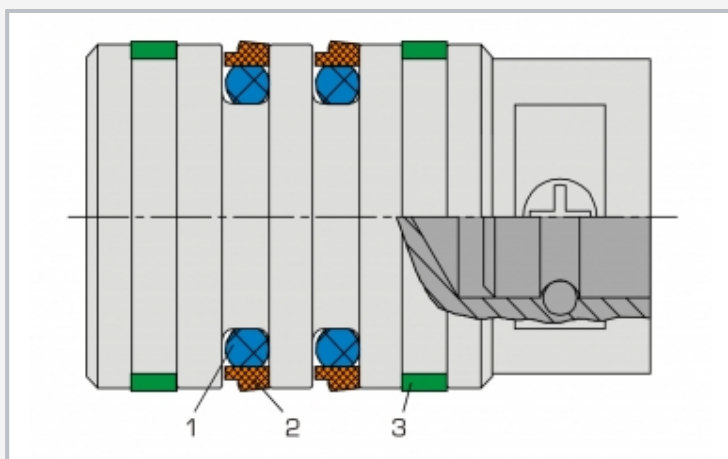
## Assembly materials tester



1 upper cross-member, 2 dial gauge for elongation, 3 clamp, 4 crosshead, 5 compression piece and pressure plate, 6 lower cross-member, 7 hydraulic cylinder, 8 hand wheel, 9 force gauge



Sectional drawing of the horizontal hydraulic cylinder: 1 trapezoidal nut, 2 hand wheel axle, 3 crank side flange, 4 cylindrical tube, 5 trapezoidal threaded spindle, 6 clamping bolt, 7 retainer, 8 piston, small, 9 pressure side flange



Piston in detail: 1 O-ring, 2 piston sealing ring, 3 guide ring

### Specification

- [1] assembly kit of a materials tester
- [2] part of the GUNT-Practice Line for assembly, maintenance and repair
- [3] hydraulic assembly of two cylinders
- [4] pipework assembly of the hydraulic system
- [5] classic destructive tests from the field of materials testing: tensile tests, Brinell hardness test
- [6] generation of tensile and compressive forces
- [7] forces generated by hand-operated hydraulic system; no power supply required
- [8] force gauge, pointer instrument with drag indicator
- [9] dial gauge for determining the elongation
- [10] hardness specimens: aluminium, copper, steel, brass
- [11] tensile specimens according to DIN 50125: aluminium, copper, steel, brass
- [12] assembly kit for MT 190.01 data acquisition available as an option

### Technical data

Test force: max. 20kN  
 Stroke: max. 45mm  
 Free installation space for specimens: 165x65mm  
 Tensile specimens: B6x30mm, DIN 50125  
 Hardness specimens: LxWxH 30x30x10mm  
 Sphere for hardness testing: Ø 10mm

### Measuring ranges

- force: 0...20kN, graduation: 0,5kN
- travel: 0...10mm, graduation: 0,01mm

LxWxH: 610x520x850mm (assembled)

Weight: approx. 53kg

### Scope of delivery

- 1 kit
- 1 set of tools
- 1 set of assembly jigs
- 1 set of small parts
- 1 set of accessories
- 1 set of specimens (4 tensile specimens, 4 hardness specimens)
- 1 set of instructional material, consisting of: technical description of system, complete set of drawings with individual parts and parts list, description of maintenance and repair processes, suggested exercises

# MT 190

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### Optional accessories

051.19001	MT 190.01	Assembly data acquisition for materials tester
020.30002	WP 300.02	Set of 4 tensile specimens, Al, Cu, St, CuZn
020.30003	WP 300.03	Set of 4 hardness specimens, Al, Cu, St, CuZn
020.30012	WP 300.12	Measuring magnifier for Brinell hardness test