

PT 108

Dimensional metrology, output shaft



The illustration shows the device and the GUNT Media Center on a tablet (not included).

Description

- **test object: output shaft as real-world machine element**
- **various test equipment**
- **testing of: surface roughness, diameters, lengths and depths**
- **digital multimedia teaching material online in the GUNT Media Center: E-Learning course, drawings, worksheets**
- **part of the GUNT DigiSkills 2 learning project**

The GUNT DigiSkills 2 learning project offers different practice kits to teach basic to advanced skills in dimensional metrology. The functional relationship of a test object is extremely significant in practice in order to assess deviations in relation to functionality.

The PT 108 practice kit has been designed to deepen knowledge of dimensional metrology in a practical manner during training and to familiarise students with functional relationships. The practice kit includes an industrially manufactured output shaft as a test object. The output shaft is an original component of the MT 123 spur and worm gear and thus has a specific functional relationship.

Selected dimensions of the output shaft are tested by reference to the main drawing. Four different pieces of test equipment are included for the test: a calliper, a depth calliper, a digital external micrometer and surface comparison plates.

The practice kit includes comprehensive didactic multimedia teaching material, which is available free of charge online in the GUNT Media Center. The E-Learning course presents fundamental knowledge and the test process in detail with appealing animations. The manual is also included as a digital version in the E-Learning course. Drawings are available as target specifications for editing the prepared digital worksheets. In this way, digital skills can be developed alongside traditional, specialist learning objectives.

Together with the MT 123 spur and worm gear device, trainees also learn about the technological environment of the test object.

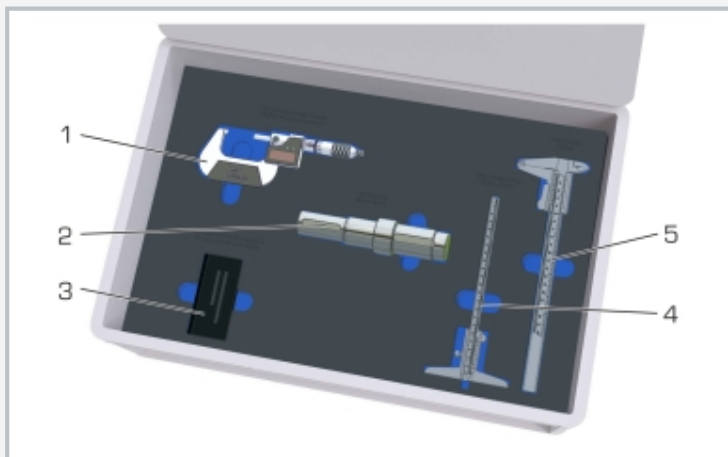
All parts are clearly laid out and well protected in a stackable storage system with foam inlays.

Learning objectives/experiments

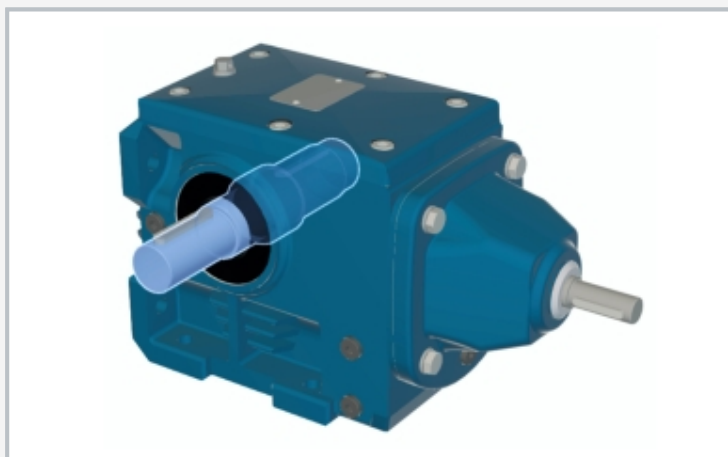
- **fundamentals of metrology: testing/measuring/gauging**
- **familiarisation with basic test equipment**
 - ▶ calliper
 - ▶ depth calliper
 - ▶ digital external micrometer
 - ▶ surface comparison plates
- **measure specified lengths, depths, diameters**
- **compare surface roughness using gauges**
- **keep measuring log**
- **estimate measurement deviations**
- **familiarisation with general tolerances according to ISO 2768-1**
- **recognise typical errors**
- **develop digital skills**
 - ▶ research information in digital networks and obtain information from digital networks
 - ▶ use digital learning media, familiarisation with and use of web-based training (WBT)
 - ▶ use assistance, simulation, diagnosis or visualisation systems, e.g. QR codes, CAD viewer tool
- **in conjunction with MT 123 spur and worm gear assembly exercise**
 - ▶ isolate test object from the overall context, recognise functional relationship

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1 digital external micrometer, 2 test object (output shaft), 3 surface comparison plates, 4 depth calliper, 5 calliper



Output shaft in the functional relationship: MT 123 spur and worm gear with highlighted driven shaft



Screenshot of the GUNT Media Center

Specification

- [1] practice kit with test object and test equipment provides basic measurement exercises of dimensional metrology for metalworking professions
- [2] part of GUNT DigiSkills: vertical teaching of digital skills in complex learning projects
- [3] testing of surface roughness, diameters, lengths and depths
- [4] measurement exercises on a test object: output shaft
- [5] output shaft as real-world machine element with functional relationship, industrially manufactured
- [6] original component from MT 123 spur and worm gear assembly exercise
- [7] sturdy storage system with labelled foam inlay
- [8] digital multimedia teaching material online in the GUNT Media Center: E-Learning course, drawings, worksheets – with solutions for teaching personnel
- [9] online access to the GUNT Media Center

Technical data

Test object

- 1 output shaft: original component from the MT 123 spur and worm gear
- testing of:
 - ▶ lengths
 - ▶ depths
 - ▶ diameters
 - ▶ surface roughness
- material: steel

Test equipment

- calliper: 0...150mm
 - ▶ reading accuracy: 0,05mm
- depth calliper: 0...150mm
 - ▶ reading accuracy: 0,05mm
- digital external micrometer: 0...25mm
 - ▶ resolution: 0,001mm
- surface comparison
 - ▶ 6 roughnesses: Rz 16, Rz 32, Rz 63, Rz 125, Rz 250, Rz 500

LxWxH: 600x400x185mm (storage system)

Weight: approx. 4,6kg

Required for operation

Web browser and Internet connection

Scope of delivery

- 1 test object
- 1 set of test equipment
- 1 online access to the GUNT Media Center with didactic accompanying material