

# DIMENSIONAL METROLOGY

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The testing and measuring of lengths, angles, radii etc. are tasks confronting all prospective skilled workers throughout their training. As well as becoming familiar with a wide range of equipment and methods, they also need to develop general skills such as:

- selecting a test or measurement method
- detecting systematic faults
- assessing measurement non-conformance
- keeping a measurement log
- reporting on results, etc.

We offer you eight different training kits aimed at achieving these learning goals. These kits are based on the assumption that you want your students to start work on the exercises immediately and without any further preparation. A kit contains everything required to begin the exercises immediately following a brief introduction. Optimal learning is achieved when students work in groups of 2/3 with each kit.

Our training kits follow the tried and proven concept for training courses in dimensional metrology developed by the Bundesinstitut für Berufsbildung (BIBB; Federal Institute for Vocational Training). And if you want to use your own measuring and testing equipment for the exercises, we will gladly supply you with just the test pieces.

Visit our website [www.gunt.de](http://www.gunt.de)

**PT 105** *Dimensional Metrology I: Training Kit 5*



- \* Tried and tested dimensional metrology exercises
- \* Several test aids and 10 test pieces
- \* Comprehensive and well-structured instructional material

**Technical Description**

This dimensional metrology practice kit is designed for practical training in the metalworking trades.

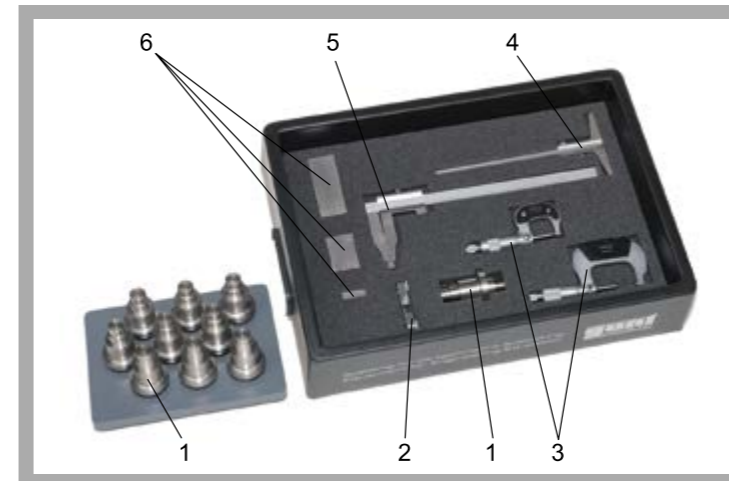
The kit offers the advantage of being ready for use immediately; it contains everything required for the exercises. The test pieces used are stainless steel shafts with various protrusions. They were manufactured with the accuracy of CNC parts. The kit includes ten shafts, all of which differ to a minor degree in dimensions and each of which is individually marked.

All parts are clearly laid out and well protected on a plastic storage system. The storage systems are stackable, providing for space-saving storage.

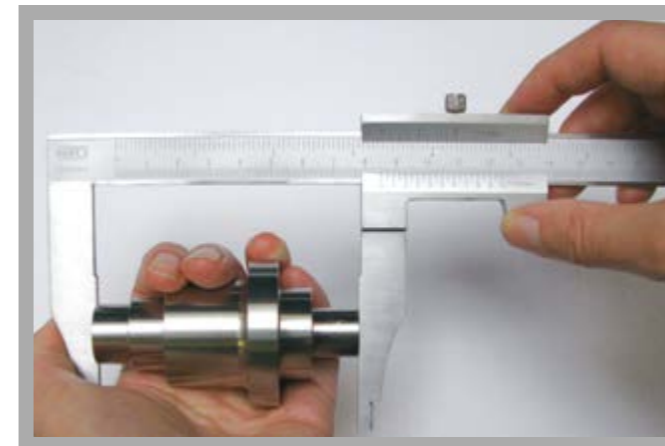
**Learning Objectives / Experiments**

- familiarisation with the various measuring devices
- measurement of pre-determined lengths
- measurement of pre-determined diameters
- measurement of pre-determined radii
- dimensional checking with block gauges
- keeping a measurement log
- estimating measurement variations
- identifying typical errors

**PT 105** *Dimensional Metrology I: Training Kit 5*



1 test piece, 2 radius gauges, 3 external micrometer, 4 depth caliper gauge, 5 caliper gauge, 6 block gauge



Measurement of length using a caliper gauge



Measurement of radius using a convex radius gauge

**Specification**

- [1] practice kit for dimensional metrology in the metalworking trades
- [2] measurement exercises on a stainless steel shaft
- [3] instructional kit complete with test pieces and measuring aids
- [4] 10 test pieces, each of different dimensions
- [5] plastic storage system to house all parts
- [6] detailed instructional material

**Technical Data**

- Test pieces
- 6 lengths
  - 7 diameters and radii measurable
- Vernier caliper gauge: 0...200mm  
Depth caliper gauge: 0...150mm  
External micrometer
- 0...25mm
  - 25...50mm
- Radius gauges: 1...7mm concave and convex  
Block gauges
- 10mm
  - 50mm
  - 90mm
  - accuracy to DIN 861/2

**Dimensions and Weight**

LxWxH: 500x350x110mm (storage system)  
Weight: approx. 7kg

**Scope of Delivery**

- 1 storage system with foam inlay
- 2 caliper gauges
- 2 external micrometers
- 1 set of radius gauges
- 3 block gauges
- 10 test pieces (shafts)
- 1 set of instructional material

**Order Details**

052.10500 PT 105 Dimensional Metrology I:  
Training Kit 5

**PT 101 Dimensional Metrology I: Training Kit 1**



- \* Tried and tested dimensional metrology exercises
- \* Several test aids and 10 test pieces
- \* Comprehensive and well-structured instructional material

**Technical Description**

The dimensional metrology practice kit is designed for practical training in the metalworking trades.

The kit offers the advantage of being ready for use immediately; it contains everything required for the exercises. The test pieces used are flat stainless steel spacer plates. They were manufactured with the accuracy of CNC parts. The kit includes ten spacer plates, all of which differ to a minor degree in length and each of which is individually marked.

All parts are clearly laid out and well protected on a plastic storage system. The storage systems are stackable, providing for space-saving storage.

**Learning Objectives / Experiments**

- familiarisation with steel ruler and vernier caliper gauge
- measurement of pre-determined lengths:
  - \* with the steel ruler and an auxiliary stop
  - \* with the vernier caliper gauge
- keeping a measurement log
- estimating measurement variations
- identifying typical errors

**Scope of Delivery**

1 storage system with foam inlay, 1 vernier caliper gauge, 1 steel ruler, 10 test pieces (spacer plates), 1 set square, 1 auxiliary stop, 1 set of instructional material

**Specification**

- [1] practice kit for dimensional metrology in the metalworking trades
- [2] measurement exercises on a stainless steel spacer plate
- [3] instructional kit complete with test pieces and measuring aids
- [4] 10 test pieces, each of different dimensions
- [5] plastic storage system to house all parts
- [6] detailed instructional material

**Technical Data**

Test pieces: 13 lengths measurable  
 Vernier caliper gauge: 200mm  
 Steel ruler: 300mm  
 Set square: 90°, LxW: 100x70mm

**Dimensions and Weight**

LxWxH: 500x350x110mm (storage system)  
 Weight: approx. 5kg

**Order Details**

052.10100 PT 101 Dimensional Metrology I:  
 Training Kit 1

G.U.N.T. Gerätebau GmbH, Hanskampring 15-17, D-22885 Barsbüttel, Phone +49 (40) 67 08 54-0, Fax +49 (40) 67 08 54-42, E-mail sales@gunt.de, Web http://www.gunt.de  
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**PT 102 Dimensional Metrology I: Training Kit 2**



- \* Tried and tested dimensional metrology exercises
- \* Several test aids and 10 test pieces
- \* Comprehensive and well-structured instructional material

**Technical Description**

This dimensional metrology practice kit is designed for practical training in the metalworking trades.

The kit offers the advantage of being ready for use immediately; it contains everything required for the exercises. The test pieces used are stainless steel bearing plates. They were manufactured with the accuracy of CNC parts. The kit includes ten bearing plates, all of which differ to a minor degree in dimensions and each of which is individually marked.

All parts are clearly laid out and well protected on a plastic storage system. The storage systems are stackable, providing for space-saving storage.

**Learning Objectives / Experiments**

- familiarisation with vernier caliper gauge, depth caliper gauge, external micrometer and depth micrometer
- measurement of pre-determined lengths, depths and diameters
- keeping a measurement log
- estimating measurement variations
- identifying typical errors

**Scope of Delivery**

1 storage system with foam inlay, 1 vernier caliper gauge, 1 pocket caliper gauge, 1 depth caliper gauge, 1 external micrometer, 1 depth micrometer, 10 test pieces (bearing plates), 1 set of instructional material

**Specification**

- [1] training kit for dimensional metrology in the metalworking trades
- [2] measurement exercises on a stainless steel bearing plate
- [3] instructional kit complete with test pieces and measuring aids
- [4] 10 test pieces, each of different dimensions
- [5] plastic storage system to house all parts
- [6] detailed instructional material

**Technical Data**

Test pieces  
 - 9 lengths, 4 depths, 4 diameters measurable  
 Vernier caliper gauge: 0...200mm  
 Pocket caliper gauge: 0...150mm  
 Depth caliper gauge: 0...150mm  
 External micrometer: 0...25mm, resolution: 0,01mm  
 Depth micrometer: 0...25mm

**Dimensions and Weight**

LxWxH: 500x350x110mm (storage system)  
 Weight: approx. 7kg

**Order Details**

052.10200 PT 102 Dimensional Metrology I:  
 Training Kit 2

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**PT 103** *Dimensional Metrology I: Training Kit 3*



- \* Tried and tested dimensional metrology exercises
- \* Several test aids and 10 test pieces
- \* Comprehensive and well structured instructional material

**Technical Description**

This dimensional metrology practice kit is designed for practical training in the metalworking trades.

The kit offers the advantage of being ready for use immediately; it contains everything required for the exercises. The test pieces used are stainless steel bushes with various inner and outer diameters. They were manufactured with the accuracy of CNC parts. The kit includes ten bushes, all of which differ to a minor degree in dimensions and each of which is individually marked.

All parts are clearly laid out and well protected on a plastic storage system. The storage systems are stackable, providing for space-saving storage.

**Learning Objectives / Experiments**

- familiarisation with the various measuring devices
- measurement of pre-determined lengths and diameters
- using an inside spring caliper as gauge
- keeping a measurement log
- estimating measurement variations
- identifying typical errors

**Scope of Delivery**

1 storage system with foam inlay, 3 caliper gauges, 2 internal micrometers, 1 inside quick caliper, 1 internal caliper, 10 test pieces (bushes), 1 set of instructional material

**Specification**

- [1] practice kit for dimensional metrology in the metalworking trades
- [2] measurement exercises on a stainless steel bush
- [3] instructional kit complete with test pieces and measuring aids
- [4] 10 test pieces, each of different dimensions
- [5] plastic storage system to house all parts
- [6] detailed instructional material

**Technical Data**

Test pieces: 6 lengths, 9 diameters measurable  
 Vernier caliper gauge: 0...200mm  
 Pocket caliper gauge: 0...150mm  
 Depth caliper gauge: 0...150mm  
 Three-point internal micrometer: d12...d16mm  
 Internal micrometer: 25...50mm  
 Inside quick caliper: 10...30mm  
 Inside spring caliper: 125mm long

**Dimensions and Weight**

LxWxH: 500x350x110mm (storage system)  
 Weight: approx. 7kg

**Order Details**

052.10300 PT 103 Dimensional Metrology I: Training Kit 3

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**PT 104** *Dimensional Metrology I: Training Kit 4*



- \* Tried and tested dimensional metrology exercises
- \* Several test aids and 10 test pieces
- \* Comprehensive and well-structured instructional material

**Technical Description**

This dimensional metrology practice kit is designed for practical training in the metalworking trades.

The kit offers the advantage of being ready for use immediately; it contains everything required for the exercises. The test pieces used are stainless steel angle plates that have been manufactured with the accuracy of CNC parts. The kit includes ten angle pieces, all of which differ to a minor degree in dimensions and each of which is individually marked.

All parts are clearly laid out and well protected on a plastic storage system. The storage systems are stackable, providing for space-saving storage.

**Learning Objectives / Experiments**

- familiarisation with a universal goniometer and its function
- measurement of pre-determined angles
- calculation of angles
- keeping a measurement log
- estimating measurement variations
- identifying typical errors

**Scope of Delivery**

1 storage system with foam inlay, 1 universal goniometer, 10 test pieces (angle pieces), 1 set of instructional material

**Specification**

- [1] practice kit for dimensional metrology in the metalworking trades
- [2] measurement exercises on a stainless steel angle piece
- [3] instructional kit complete with test pieces and measuring aids
- [4] 10 test pieces, each of different dimensions
- [5] plastic storage system to house all parts
- [6] detailed instructional material

**Technical Data**

Test pieces: 6 angles measurable  
 Universal goniometer  
 - track length: 150mm  
 - adjustable to any angle

**Dimensions and Weight**

LxWxH: 500x350x110mm (storage system)  
 Weight: approx. 5kg

**Order Details**

052.10400 PT 104 Dimensional Metrology I: Training Kit 4

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**PT 106 Dimensional Metrology I: Training Kit 6**



- \* Tried and tested dimensional metrology exercises
- \* Several test aids and 10 test pieces
- \* Comprehensive and well-structured instructional material

**Technical Description**

This dimensional metrology practice kit is designed for practical training in the metalworking trades.

The kit offers the advantage of being ready for use immediately; it contains everything required for the exercises. The test pieces used are stainless steel shafts with various protrusions including one square section. They were manufactured with the accuracy of CNC parts. The kit includes ten shafts, all of which differ to a minor degree in dimensions and each of which is individually marked.

All parts are clearly laid out and well protected on a plastic storage system. The storage systems are stackable, providing for space-saving storage.

**Learning Objectives / Experiments**

- familiarisation with the various measuring and testing devices
- measurement of pre-determined dimensions
- keeping a measurement log
- estimating measurement variations
- identifying typical errors

**Scope of Delivery**

1 storage system with foam inlay, 2 caliper gauges, 1 set of radius gauges, 1 universal goniometer, 10 test pieces (shafts), 1 set of instructional material

**Specification**

- [1] practice kit for dimensional metrology in the metalworking trades
- [2] measurement exercises on a stainless steel shaft
- [3] instructional kit complete with test pieces and measuring aids
- [4] 10 test pieces, each of different dimensions
- [5] plastic storage system to house all parts
- [6] detailed instructional material

**Technical Data**

- Test pieces
  - 9 lengths and angles, 7 diameters and radii measurable
- Vernier caliper gauge: 0...200mm
- Depth caliper gauge: 0...150mm
- Radius gauges: 1...7mm concave and convex
- Universal goniometer
  - track length: 150mm
  - adjustable to any angle

**Dimensions and Weight**

LxWxH: 500x350x110mm (storage system)  
Weight: approx. 6kg

**Order Details**

052.10600 PT 106 Dimensional Metrology I:  
Training Kit 6

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**PT 201 Dimensional Metrology II: Training Kit 1**



- \* Tried and tested dimensional metrology exercises
- \* Several test aids and 6 test pieces
- \* Comprehensive and well-structured instructional material

**Technical Description**

This dimensional metrology practice kit is designed for practical training in the metalworking trades.

The kit offers the advantage of being ready for use immediately; it contains everything required for the exercises. The test pieces used are stainless steel slotted shafts. They were manufactured with the accuracy of CNC parts. The kit includes six shafts, all of which differ to a minor degree in dimensions and each of which is individually marked.

All parts are clearly laid out and well protected on a plastic storage system. The storage systems are stackable, providing for space-saving storage.

**Learning Objectives / Experiments**

- checking shaft slots
  - \* width and depth
  - \* parallelism
- keeping a measurement log
- estimating measurement variations

**Scope of Delivery**

1 storage system with foam inlay, 2 caliper gauges, 1 micrometer, 1 dial gauge, 1 V-block with fixture, 1 block gauge box, 1 magnetic stand, 6 test pieces (shafts), 1 set of instructional material

**Specification**

- [1] practice kit for dimensional metrology in the metalworking trades
- [2] measurement exercises on a stainless steel shaft
- [3] instructional kit complete with test pieces and measuring aids
- [4] 6 test pieces, each of different dimensions
- [5] box of 32 block gauges, DIN EN ISO 3650
- [6] plastic storage system to house all parts
- [7] detailed instructional material

**Technical Data**

- Test pieces: 4 dimensions measurable
- Pocket caliper gauge: 0...150mm
- Depth micrometer: 0...75mm
- Dial gauge: 0...1mm, graduations: 0,001mm
- Key-way vernier caliper: D=5...80mm
- V-Block: indent 90°

**Dimensions and Weight**

LxWxH: 500x350x110mm (storage system)  
Weight: approx. 12kg

**Order Details**

052.20100 PT 201 Dimensional Metrology II:  
Training Kit 1

G.U.N.T Gerätebau GmbH, Hanskampring 15-17, D-22885 Barsbüttel, Phone +49 (40) 67 08 54-0, Fax +49 (40) 67 08 54-42, E-mail sales@gunt.de, Web http://www.gunt.de  
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**PT 202**

**Dimensional Metrology II: Training Kit 2**



- \* Tried and tested dimensional metrology exercises
- \* Several test aids and 8 test pieces
- \* Comprehensive and well-structured instructional material

**Technical Description**

This dimensional metrology practice kit is designed for practical training in the metalworking trades.

The kit offers the advantage of being ready for use immediately; it contains everything required for the exercises. The test pieces used are stainless steel internal and external tapers. They were manufactured with the accuracy of CNC parts. The kit includes eight tapers, all of which differ to a minor degree in dimensions and each of which is individually marked.

All parts are clearly laid out and well protected on a plastic storage system. The storage systems are stackable, providing for space-saving storage.

**Learning Objectives / Experiments**

- checking tapers:
  - \* checking an external taper with the taper ring gauge
  - \* checking an internal taper with the taper plug gauge
- keeping a measurement log
- estimating measurement variations

**Scope of Delivery**

1 storage system with foam inlay, 1 depth caliper gauge, 1 taper ring gauge, 1 taper plug gauge, 8 test pieces (4 internal tapers, 4 external tapers), 1 set of instructional material

**Specification**

- [1] practice kit for dimensional metrology in the metalworking trades
- [2] measurement exercises on an external and internal taper
- [3] instructional kit complete with test pieces and measuring aids
- [4] 8 stainless steel test pieces, each of different dimensions
- [5] plastic storage system to house all parts
- [6] detailed instructional material

**Technical Data**

Test pieces: 3 dimensions measurable  
 Taper ring gauge MK 3  
 Taper plug gauge MK 3  
 Depth caliper gauge: 0...150mm

**Dimensions and Weight**

LxWxH: 500x350x110mm (storage system)  
 Weight: approx. 4kg

**Order Details**

052.20200 PT 202 Dimensional Metrology II: Training Kit 2

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