

**norm****NEN-EN-ISO 3126**

Kunststofleidingsystemen -  
Kunststofleidingcomponenten - Meting en  
bepaling van afmetingen (herziening van  
prEN 496:1991 en ISO 3126:1974)  
(ISO/DIS 3126:1999,IDT)

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Systèmes de canalisations plastiques - Composants de  
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dimensions (révision du prEN 496:1991 et de l'ISO  
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Kunststoffen - Ermittlung und Bestimmung der Maße  
(Revision der prEN 496:1991 und der ISO 3126:1974)  
(ISO/DIS 3126:1999)

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## Foreword

The text of prEN ISO 3126:1999 has been prepared by Technical Committee CEN/TC 155 "Plastics piping systems and ducting systems", the secretariat of which is held by NNI, in collaboration with Technical Committee ISO/TC 138 "Plastics pipes, fittings and valves for the transport of fluids".

This document is currently submitted to the parallel Enquiry.

This European Standard supersedes EN 496:1991 and EN ISO 3126:1974.

This standard is one of a series of standards on test methods which support system standards for plastics piping systems and ducting systems.

It includes the following:

- Annex A (normative): Determination of other measurements of glass-reinforced thermosetting products
- Bibliography

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## 1 Scope

This draft standard specifies methods for measurement and/or determination of the dimensions of plastics pipes and fittings and the accuracy of the measurement.

It specifies procedures for measuring angles, diameters, lengths, squareness and wall thicknesses for the purposes of checking conformity to geometric limits.

## 2 Normative references

This standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

ISO/R 463:1965<sup>1)</sup>, *Dial gauges reading in 0,01 mm, 0,001 in and 0,0001 in*

ISO 3599:1976, *Vernier callipers reading to 0,1 and 0,05 mm*

ISO 3611:1978, *Micrometer callipers for external measurement*

ISO 6507-1:1997, *Metallic materials — Vickers hardness test — Part 1: Test method*

## 3 Definitions

For the purposes of this standard the following definitions apply.

### 3.1

#### **accuracy**

The closeness of agreement between a test result and the accepted reference value.

NOTE 1 The term "accuracy" when applied to a set of test results, involves a combination of random components and a common systematic error or bias component.

NOTE 2 Reproduced from ISO 3534-1:1993 [1].

### 3.2

#### **calibration**

Set of operations that establish, under specified conditions, the relationship between values of quantities indicated by a measuring instrument or measuring system, or values represented by a material measure or a reference material, and the corresponding values realised by standards.

## 4 Measuring devices

### 4.1 General requirements

#### 4.1.1 Accuracy of measuring devices

The measuring device shall be selected so that the required accuracy of the measured dimension is obtained.

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1) Under revision, see ISO/DIS 463:1996 [2].

#### 4.1.2 Calibration

All device used for measuring shall be calibrated at regular intervals of time in accordance with the manufacturer's quality plan. The calibration shall be traceable to an accredited normal.

### 4.2 Instruments

#### 4.2.1 Contact instruments

4.2.1.1 When using contact instruments, the force applied to the surface of the test piece shall not cause local deformation that would significantly affect the measuring results.

Other contact instruments than those mentioned in 4.2.1.3, 4.2.1.4, 4.2.1.5 and 4.2.1.7 may also be used.

4.2.1.2 Measuring devices that require contact between the test piece and one or more surfaces, e.g. a tube micrometer, shall conform to the following:

- a) the surface in contact with the internal surface of a component shall have a radius less than that of the test piece surface with which it is in contact;
- b) the surface in contact with the external surface of a component shall be either flat or radiused;
- c) the contact surfaces of the instrument shall have a hardness not less than 500 HV when tested in accordance with ISO 6507-1:1997.

4.2.1.3 If the measuring instrument comprises a calliper, it shall conform to either ISO 3611:1978 or ISO 3599:1976, as applicable.

4.2.1.4 If the measuring instrument incorporates a dial gauge, it shall conform to ISO/R 463:1965<sup>2</sup>.

4.2.1.5 If the device comprises a circumference tape ( $\pi$  tape), it shall be graduated in diameters expressed in millimetres. When a force of 2,5 N is applied in the longitudinal direction to the extremities of the tape, the elongation of the tape shall not exceed 0,05 mm/m.

4.2.1.6 Measuring instruments may be used in conjunction with a setting standard of calibrated thickness or length, and then used as a comparator, i.e. to measure small differences between the setting piece and the measured dimension on the test piece.

NOTE This is particularly recommended when measuring large diameter or thick walled components.

4.2.1.7 Go/no-go plug gauges or ring gauges may be used for checking conformity to specific limits.

#### 4.2.2 Non-contact instruments

If non-contact instruments or devices based on e.g. optical or ultrasonic scanning devices are used, the accuracy of measurement shall conform to accuracy levels specified in the relevant sub-clause of clause 5 or their use shall be restricted to finding relevant positions for measurements to be made by other means, e.g. points comprising maximum or minimum dimensions.

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2 Under revision, see ISO/DIS 463:1996 [2].



## 5 Procedures for dimension determination

### 5.1 General

5.1.1 Ensure that measurement of dimensions is carried out by adequately trained personnel.

5.1.2 Unless otherwise specified in the referring standard, ensure that either:

- a) the temperature of the measuring device, the test piece and the ambient air temperature are at  $(23 \pm 4)$  °C; or
- b) results are correlated by calculation or experience to their value at 23 °C.

5.1.3 Examine the test piece surface for any features that could affect dimensional measurements, e.g. marking, parting lines, blisters or inclusions. If found, record their nature and effects on the measurement.

5.1.4 For selection of the cross-section(s) in which to make measurements, one or more of the following shall apply, as applicable:

- a) select cross-section(s) as specified by the referring standard;
- b) identify a cross-section not less than 25 mm from the end;
- c) for measurements of a dimension associated with another dimension, e.g. to enable calculation of a further dimension, the cross-section shall be appropriate to the dimension to be calculated.

5.1.5 Results of measurements are rounded as specified in 5.2.3, 5.3.3 and 5.3.4. In case of average values the rounding shall not be done before the average has been calculated.

### 5.2 Wall thicknesses

#### 5.2.1 General

Select instrument(s) or device(s) for measuring wall thickness so that the accuracy of the result is within the limits given in Table 1.

Table 1 — Measurement of wall thickness

Dimensions in millimetres

Wall thickness	Required accuracy of individual result	Round arithmetic mean value to the nearest:
≤ 10	0,03	0,05
> 10 and ≤ 30	0,05	0,1
> 30	0,1	0,1

#### 5.2.2 Maximum and minimum wall thicknesses at any point

Move the measuring device until the positions of the maximum and minimum wall thicknesses in the selected cross-sections are found and record these observed values.

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