



**BSI Standards Publication**

## **Copper and copper alloys — Plumbing fittings**

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Part 20: Definitions, thread dimensions, test methods,  
reference data and supporting information

## National foreword

This British Standard is the UK implementation of EN 1254-20:2021+A1:2025. It supersedes BS EN 1254-20:2021, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by A1 A1.

The UK participation in its preparation was entrusted to Technical Committee NFE/34, Copper and copper alloys.

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English Version

## Copper and copper alloys - Plumbing fittings - Part 20: Definitions, thread dimensions, test methods, reference data and supporting information

Cuivre et alliages de cuivre - Raccords - Partie 20 :  
Définitions, dimensions de filetage, méthodes d'essai,  
données de référence et informations complémentaires

Kupfer und Kupferlegierungen - Fittings - Teil 20:  
Definitionen, Gewindemaße, Prüfverfahren,  
Referenzdaten und ergänzende Informationen

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## European foreword

This document (EN 1254-20:2021+A1:2025) has been prepared by Technical Committee CEN/TC 133 “Copper and copper alloys”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2025, and conflicting national standards shall be withdrawn at the latest by August 2025.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document includes Amendment 1 approved by CEN on 5 December 2024.

This document supersedes A1 EN 1254-20:2021 A1.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

A1 The need for an amendment was based on the following points:

- include a wall thickness table for copper alloy fittings used in systems according to EN ISO 15874, EN ISO 15875, EN ISO 15876, EN ISO 15877, EN ISO 21003 and EN ISO 22391. A1

This document is a supporting standard describing the test methods used by the other parts of the EN 1254 series.

EN 1254 comprises the following parts under the general title “Copper and copper alloys — Plumbing fittings”:

- *Part 1: Capillary fittings for soldering or brazing to copper tubes*
- *Part 2: Compression fittings for use with copper tubes*
- *Part 3: Compression fittings for use with plastics and multilayer pipes*
- *Part 4: Threaded fittings*
- *Part 5: Capillary fittings with short ends for brazing to copper tubes*
- *Part 6: Push-fit fittings for use with metallic tubes, plastics and multilayer pipes*
- *Part 7: Press fittings for use with metallic tubes*
- *Part 8: Press fittings for use with plastics and multilayer pipes*
- *Part 20: Definitions, thread dimensions, test methods, reference data and supporting information*

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## 1 Scope

This document contains definitions, thread dimension, reference data (minimum bore  $A_1$ ) and wall thickness ( $A_1$ ), supporting information (assembling instructions) and describes the test methods referenced by other parts of the EN 1254 series.

Thread dimensions comprise: wall thickness at threaded portions of fittings, dimensions of tail pipe ends for swivel fittings, dimensions of gas union connectors, thread dimensions and thread profile.

Test methods comprise: leak tightness under internal hydrostatic pressure, leak tightness under internal pneumatic pressure, integrity of fabricated fitting bodies or having an 'as cast' microstructure, resistance to pull out of joints to metallic tubes, resistance of joints with metallic tube to vibration, resistance of joints to static flexural force, leak tightness of joints under vacuum, the resistance of joints to temperature cycling, detecting non-pressed fitting ends, resistance to stress corrosion, detection of a carbon film on the surface of copper fittings, determination of mean depth of dezincification, resistance of joints to pressure cycling, disconnection and re-use, determining if the diameter and/or the length of engagement of a capillary end is/are within the specified tolerance, determining the minimum length of engagement of an integral solder or brazing ring socket having a formed groove.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 723, *Copper and copper alloys - Combustion method for determination of the carbon content on the inner surface of copper tubes or fittings*

EN 1057, *Copper and copper alloys - Seamless, round copper tubes for water and gas in sanitary and heating applications*

EN 1333:2006, *Flanges and their joints - Pipework components - Definition and selection of PN*

EN 10226-1, *Pipe threads where pressure tight joints are made on the threads - Part 1: Taper external threads and parallel internal threads - Dimensions, tolerances and designation*

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation (ISO 228-1)*

EN ISO 6509-1:2014, *Corrosion of metals and alloys - Determination of dezincification resistance of copper alloys with zinc - Part 1: Test method (ISO 6509-1:2014)*

EN ISO 6708:1995, *Pipework components - Definition and selection of DN (nominal size) (ISO 6708:1995)*

EN ISO 21003-1:2008, *Multilayer piping systems for hot and cold water installations inside buildings - Part 1: General (ISO 21003-1:2008)*

ISO 7-1:1994, *Pipe threads where pressure-tight joints are made on the threads - Part 1: Dimensions, tolerances and designation*

ISO 7-2, *Pipe threads where pressure-tight joints are made on the threads - Part 2: Verification by means of limit gauges*

ISO 2859-1:1999, *Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 6957:1988, *Copper alloys - Ammonia test for stress corrosion resistance*

### 3 Terms and definitions

For the purposes of this document and other parts of the EN 1254 series, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

#### 3.1

##### **plumbing fitting**

device used in a tube system for the purpose of connecting the tubes or pipes either to each other or to a component part of the system

#### 3.2

##### **capillary end**

end in which the joint is made by the flow of solder or brazing alloy by capillary action into the annular space between the capillary end and its connecting part

#### 3.3

##### **end feed fitting**

##### **EF**

plumbing fitting including one or more capillary ends where the solder or brazing alloy for the capillary action is introduced externally into the annular space when a connection is made

#### 3.4

##### **integral solder ring fitting**

##### **ISR**

plumbing fitting including one or more capillary ends that contains the solder alloy needed to make the connection

#### 3.5

##### **integral brazing ring fitting**

##### **IBR**

plumbing fitting including one or more capillary ends that contains the brazing alloy needed to make the connection

#### 3.6

##### **socket**

type of end defined by its internal diameter

#### 3.7

##### **male end**

type of end defined by its external diameter

#### 3.8

##### **compression end**

end in which a mechanical joint is formed by the tightening of a nut to compress a ring or sleeve onto the outside wall of the tube, or clamp a flared portion of the tube to the body of a fitting

### 3.8.1

#### **compression end, Type A, non manipulative**

end that requires no preparation of the ends of the tube or pipe other than that they are cut square and deburred, or chamfered when specified, and in which the joint is made by the compression of a ring or sleeve onto the outside wall of the tube or pipe with or without additional sealing elements and with or without an internal tube support

Note 1 to entry: The sealing element may be metallic or non-metallic.

### 3.8.2

#### **compression end, Type B, manipulative**

end that requires forming of the tube or pipe at its end, and in which the joint is made by compressing the formed portion of the tube or pipe against the formed end of the fitting or a loose ring or sleeve within the fitting/tube/pipe

### 3.9

#### **union end**

end which enables connection and disconnection with minimal disturbance of other pipe sections

Note 1 to entry: Union ends can be sphere to cone, cone to cone, cone to radius or flat face with a sealing member.

Note 2 to entry: Component parts of union ends from different manufacturers should not be regarded as interchangeable.

### 3.10

#### **interface thread**

end that has male or female jointing or fastening thread, used to connect with a corresponding threaded pipe or fitting

### 3.11

#### **jointing thread**

thread on a fitting end in which the joint is made pressure tight on the thread

### 3.12

#### **fastening thread**

thread to provide mechanical assembly of a joint in which the seal is not made on the thread

### 3.13

#### **push-fit end**

end which incorporates a sealing element and a gripping device

Note 1 to entry: The joint is made by pushing the tube into the fitting and a seal is achieved without the use of heat or tools.

Note 2 to entry: In some designs, this type of joint can be disconnected and re-connected or disconnected and the fitting re-used elsewhere.

### 3.14

#### **supporting sleeve**

device permanently inserted in the tube end to provide internal support for low strength tube or pipe materials

 Note 1 to entry: The supporting sleeve may be a part of the fitting that sits within the bore of the pipe or tube, or a separate component. 

**3.15****press connection**

press end in which the joint is effected by the compression and permanent deformation of the ends of the fitting and/or the tube or male end of a fitting with a pressing tool

**3.15.1****radial press end**

press end in which the joint is effected by radial compression of the ends of the fitting and the tube with a pressing tool

**3.15.2****axial press end**

press end in which the joint is effected by axial movement of a compression sleeve with a tool to compress the ends of the fitting and the tube

**3.15.3****compression sleeve**

sleeve moved along the axis of a pipe to compress a fitting end

**3.16****pressing tools and jaws**

mechanical device which, by closing jaws, either directly or indirectly (axial press end) causes radial compression of the plumbing fitting end onto the connecting tube

**3.17****reducer**

fitting or an adaptor used to enable connections between pipework components of different nominal diameters

**3.18****adaptor fitting**

fitting combining more than one type of end

**3.19****nominal diameter**

nominal diameter of the fitting end expressed as the nominal outside diameter of the connecting tube or pipe

**3.20****multilayer pipe**

pipe comprising more than one layer, see definitions according to EN ISO 21003-1:2008, 3.1.1, 3.1.2 and 3.1.3

**3.21****fuel gas**

combustible gases which are gaseous at 15 °C and 1 013 mbar and are generally odorized for safety reasons, are commonly referred to as manufactured gas, natural gas or liquefied petroleum gases (LPG)

Note 1 to entry: They are also referred to as first, second or third family gases (see EN 437:2018, Table 1).

### 3.22

#### **maximum operating pressure**

##### **MOP**

maximum operating pressure at which pipework intended for fluids can be operated under normal operating conditions

### 3.23

##### **PN**

alphanumeric designation used for reference purposes related to a combination of mechanical and dimensional characteristics of a component of a pipework system

Note 1 to entry: It comprises the letters PN followed by a dimensionless number.

Note 2 to entry: The maximum allowable pressure of a pipework component depends on the PN number, the material and design of the component, its maximum allowable temperature, etc.

[SOURCE: EN 1333:2006, 2.1]

### 3.24

##### **AQL**

Acceptance Quality Limit (AQL) is defined in ISO 2859-1:1999, Table I and IIA

### 3.25

##### **DN**

alphanumeric designation of size for components of a pipework system, which is used for reference purposes. It comprises the letters DN followed by a dimensionless whole number which is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections

[SOURCE; EN ISO 6708:1995, 2.1]

## **4 Thread dimensions**

### **4.1 Wall thickness at threaded portions of fittings**

The minimum wall thickness at threaded portions of fittings, see Figure 1, shall be as expressed in Table 1 for the relevant diameters.

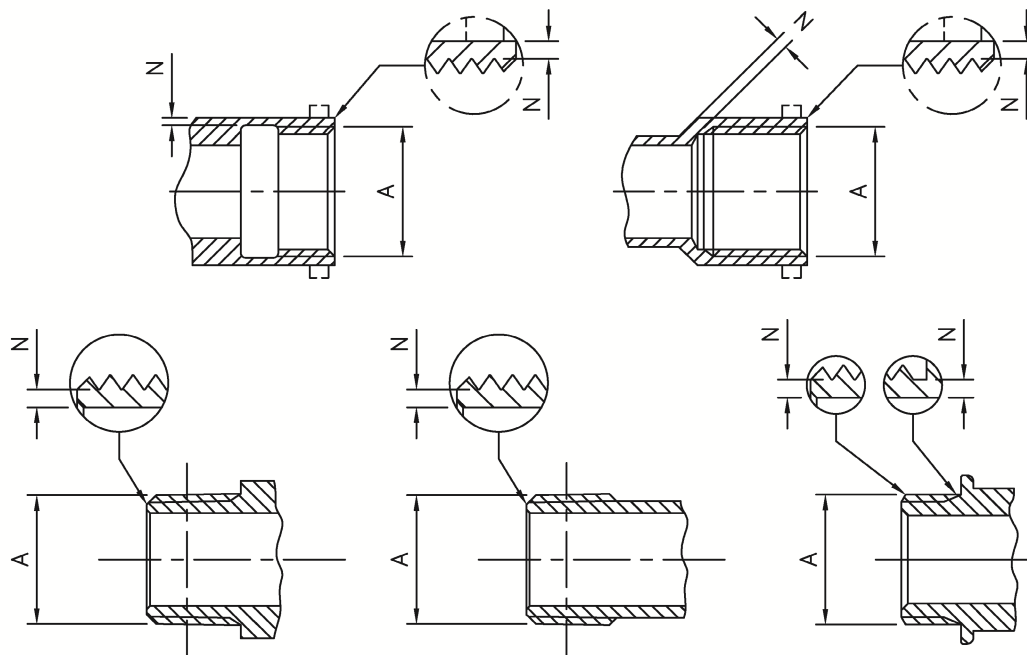


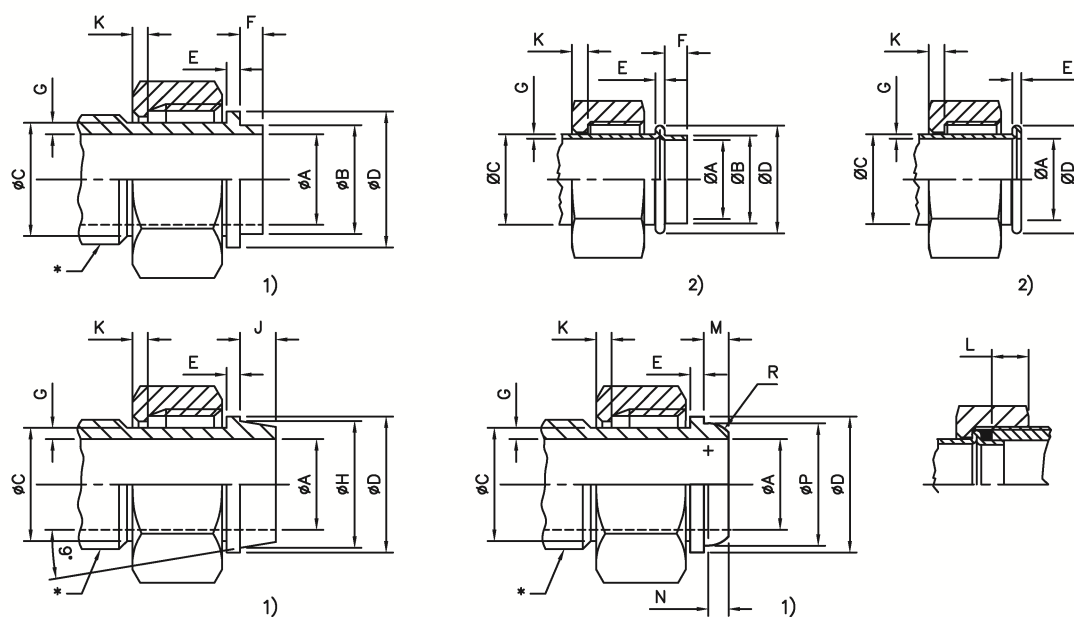
**Figure 1 — Minimum wall thickness at threaded portions of fittings**

**Table 1 — Minimum wall thickness at threaded portions of fittings**

| Thread designation | Minimum wall thickness of fitting<br><i>N</i>                              |                                            |
|--------------------|----------------------------------------------------------------------------|--------------------------------------------|
|                    | Wrought coppers<br>and copper alloys<br>and continuously<br>cast bar<br>mm | Cast coppers<br>and copper<br>alloys<br>mm |
| 1/8                | 1,0                                                                        | 1,0                                        |
| 1/4                | 1,0                                                                        | 1,0                                        |
| 3/8                | 1,1                                                                        | 1,1                                        |
| 1/2                | 1,2                                                                        | 1,2                                        |
| 3/4                | 1,4                                                                        | 1,5                                        |
| 1                  | 1,5                                                                        | 1,8                                        |
| 1 1/4              | 1,6                                                                        | 1,8                                        |
| 1 1/2              | 1,8                                                                        | 2,0                                        |
| 2                  | 1,9                                                                        | 2,3                                        |
| 2 1/2              | 2,0                                                                        | 2,4                                        |
| 3                  | 2,3                                                                        | 2,6                                        |
| 4                  | 2,8                                                                        | 2,9                                        |

#### 4.2 Dimensions of tail pipe ends for swivel fittings

The dimensions of tail pipe ends for swivel fittings, see Figure 2, shall be as expressed in Table 2 for the relevant thread size.



### Key

- 1 wrought or cast alloy body  
2 drawn tubular body

Figure 2 — Tail pipe ends for swivel fittings

Table 2 — Dimensions of tail pipe ends for swivel fittings

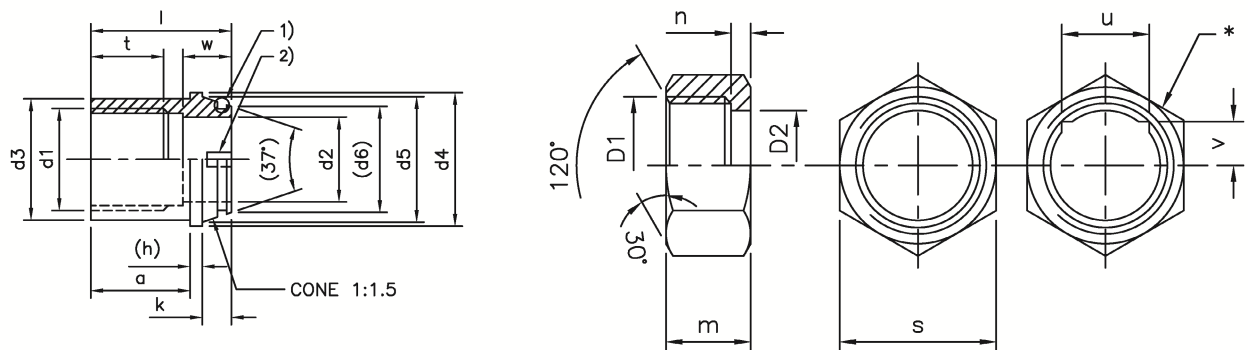
| Dimension       | A                            |                | B    | C    | D    |      | E                      |                  | F    |      | G                |                |                |
|-----------------|------------------------------|----------------|------|------|------|------|------------------------|------------------|------|------|------------------|----------------|----------------|
| Nut thread size | Min. (Wrought or drawn tube) | Min. (casting) | Max. | Max. | Max. | Min. | Min. (Wrought or cast) | Min. (Draw tube) | Max. | Min. | Min. (Draw tube) | Min. (Wrought) | Min. (Casting) |
| in              | mm                           | mm             | mm   | mm   | mm   | mm   | mm                     | mm               | mm   | mm   | mm               | mm             | mm             |
| 1/2             | 11,0                         | 10,2           | 14,6 | 15,1 | 18,5 | 18,0 | 2,4                    | 1,4              | 6,4  | 4,7  | 0,7              | 1,2            | 1,4            |
| 3/4             | 16,1                         | 15,3           | 19,8 | 20,0 | 24,0 | 23,5 | 2,4                    | 1,8              | 6,4  | 4,7  | 0,9              | 1,4            | 1,6            |
| 1               | 21,2                         | 20,4           | 25,7 | 25,7 | 30,2 | 29,4 | 3,0                    | 1,8              | 6,4  | 4,7  | 0,9              | 1,5            | 1,8            |
| 1 1/4           | 25,4                         | 25,4           | 34,0 | 33,6 | 38,9 | 38,0 | 3,3                    | 2,0              | 8,0  | 6,3  | 1,0              | 1,6            | 1,9            |
| 1 1/2           | 31,7                         | 31,7           | 39,6 | 39,2 | 44,8 | 43,9 | 3,8                    | 2,2              | 9,6  | 7,9  | 1,1              | 1,8            | 2,2            |
| 2               | 44,4                         | 43,7           | 50,8 | 50,7 | 56,6 | 55,4 | 4,0                    | 2,4              | 9,6  | 7,9  | 1,2              | 2,0            | 2,3            |
| 2 1/2           | 50,8                         | 50,8           | 56,6 | 62,0 | 71,9 | 71,0 | 4,3                    | 2,4              | 9,6  | 7,9  | 1,2              | 2,0            | 2,4            |

| Dimension       | H    | J    | K    | L                   |                          | M          | N          | P    |      | R          |
|-----------------|------|------|------|---------------------|--------------------------|------------|------------|------|------|------------|
| Nut thread size | Max. | Min. | Min. | Min. (Taper spigot) | Min. (Parallel and flat) | $\pm 0,25$ | $\pm 0,25$ | Max. | Min. | $\pm 0,25$ |
| in              | mm   | mm   | mm   | mm                  | mm                       | mm         | mm         | mm   | mm   | mm         |
| 1/2             | 17,0 | 7,9  | 2,5  | 4,5                 | 6,0                      | 5,5        | 4,5        | 15,1 | 14,9 | 6,0        |
| 3/4             | 22,3 | 7,9  | 3,1  | 4,5                 | 6,0                      | 5,5        | 4,5        | 20,4 | 20,2 | 6,0        |
| 1               | 28,0 | 7,9  | 3,4  | 5,5                 | 8,0                      | 5,5        | 4,5        | 27,1 | 26,9 | 6,0        |
| 1 1/4           | 36,9 | 9,5  | 3,9  | 5,5                 | 8,0                      | 7,0        | 5,5        | 34,6 | 34,4 | 6,0        |
| 1 1/2           | 42,6 | 9,5  | 4,7  | 5,5                 | 8,0                      | 7,0        | 5,5        | 41,2 | 41,1 | 6,0        |
| 2               | 54,3 | 12,7 | 4,7  | 5,5                 | 8,0                      | 7,5        | 5,5        | 50,1 | 49,9 | 6,0        |
| 2 1/2           | 60,2 | 12,7 | 5,0  | 6,5                 | 8,0                      | 8,5        | 6,5        | 65,2 | 64,9 | 7,0        |

Only dimensions A, B, D and F are relevant for the interface. The other dimensions are informative.

### 4.3 Dimensions of gas union connectors

The dimensions of fittings with gas union connectors, see Figure 3, shall be as expressed in Table 3 for corresponding nominal size.



#### Key

- 1 seal defined by manufacturer
- 2 features for transmission of tightening torque, defined by manufacturer

Figure 3 — Gas union connector

Table 3 — Dimensions of gas union connectors

Dimensions in millimetres

| Nominal size                    | Matching thread or pipe | Union     |           |           |       |      |               |             |      |     |     |      |          | Nut  |                     |      |      |     |      |   |   |
|---------------------------------|-------------------------|-----------|-----------|-----------|-------|------|---------------|-------------|------|-----|-----|------|----------|------|---------------------|------|------|-----|------|---|---|
| DN                              | d1                      | d2        |           | d3        | d4    | d5   |               | (d6)        | a    | (h) | k   | l    | t<br>Min | w    | D1 <sup>2)</sup>    | D2   | m    | n   | s    | u | v |
| 10                              | Rp 3/8                  | 13,0      | 14,0      | 20,0      | 23,5  | 1)   |               | 1)          | 18,0 | 1)  | 1)  | 1)   | 11,4     | 1)   | G3/8                | 13,2 | 12   | 2,5 | 19,0 | - | - |
| 15                              | Rp 1/2                  | 17,0      | 18,0      | 25,0      | 27,5  | 25,7 | 25,9          | 21,8        | 20,5 | 2,5 | 6,0 | 29,0 | 15,0     | 10,0 | G7/8                | 25,5 | 16,0 | 3,5 | 34,0 | - | - |
| 20                              | Rp 3/4                  | 21,0      | 23,0      | 31,0      | 34,5  | 33,4 | 33,6          | 28,8        | 24,0 | 2,5 | 7,0 | 33,5 | 16,3     | 12,5 | G11/8               | 31,5 | 18,0 | 3,5 | 41,0 | - | - |
| 25                              | Rp 1                    | 26,5      | 28,5      | 37,0      | 41,0  | 39,7 | 39,9          | 34,5        | 28,0 | 4,5 | 8,0 | 40,5 | 19,1     | 16,5 | G13/8 <sup>3)</sup> | 37,5 | 21,0 | 4,0 | 48,0 | - | - |
| 32                              | Rp 1 1/4                | 34,5      | 36,5      | 47,0      | 50,5  | 48,3 |               | 42,8        | 31,5 | 4,5 | 8,4 | 1)   | 21,4     | 18,0 | G13/4               | 48,0 | 23,0 | 4,5 | 58,0 | - | - |
| 1) Not yet defined 1            |                         |           |           |           |       |      |               |             |      |     |     |      |          |      |                     |      |      |     |      |   |   |
| 2) To ISO 228–1                 |                         |           |           |           |       |      |               |             |      |     |     |      |          |      |                     |      |      |     |      |   |   |
| 3) Not to ISO 228 details below |                         | Major Dia | Pitch Dia | Minor Dia | Pitch | TPI  | Thread Height | Root Radius |      |     |     |      |          |      |                     |      |      |     |      |   |   |
|                                 |                         | G1 3/8    | 44,3      | 42,8      | 41,4  | 2,31 | 11            | 1,48        | 0,32 |     |     |      |          |      |                     |      |      |     |      |   |   |

## 4.4 Threaded end dimensions

### 4.4.1 General

The threaded end dimensions shall be in accordance with:

- For internal parallel threads, see Figure 4 and Table 4 or Figure 5 and Table 5;
- For external taper threads, see Figure 6 and Table 6 or see Figure 7 and Table 7;
- For external parallel threads, see Figure 8 and Table 8.

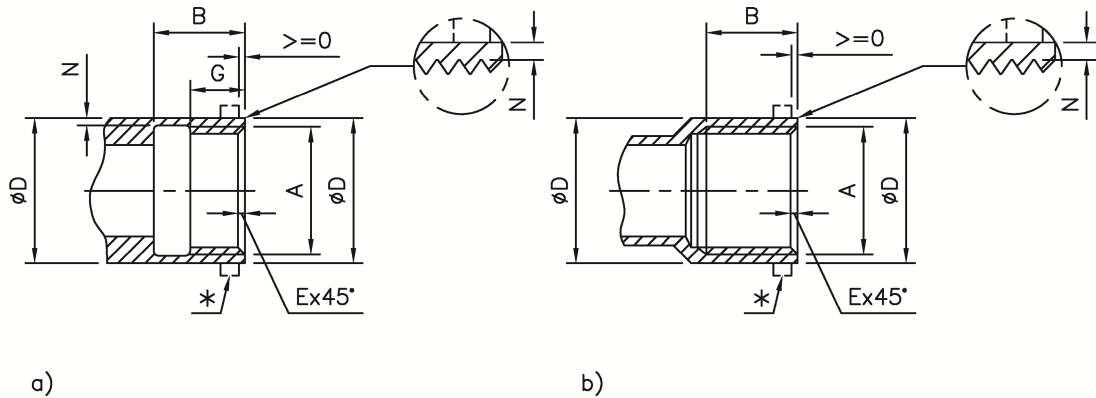
Thread details not specified in this part of this document shall conform to ISO 7 or EN 10226-1 or EN ISO 228-1.

If a sealing face is provided at threaded portions of the fitting then the minimum outside diameter of the face shall be in accordance with dimension C given in Table 8 fittings with “Internal EN ISO 228-1 parallel threads.

For gas applications, national regulations in force can require adherence to specific standards for threads.

Alternative thread lengths or gauging systems should be agreed between the manufacturer and the purchaser.

#### 4.4.2 Internal ISO 7 parallel threads or EN 10226-1



#### Key

- \* optional bead for strength
- N for minimum wall thickness see Table 1

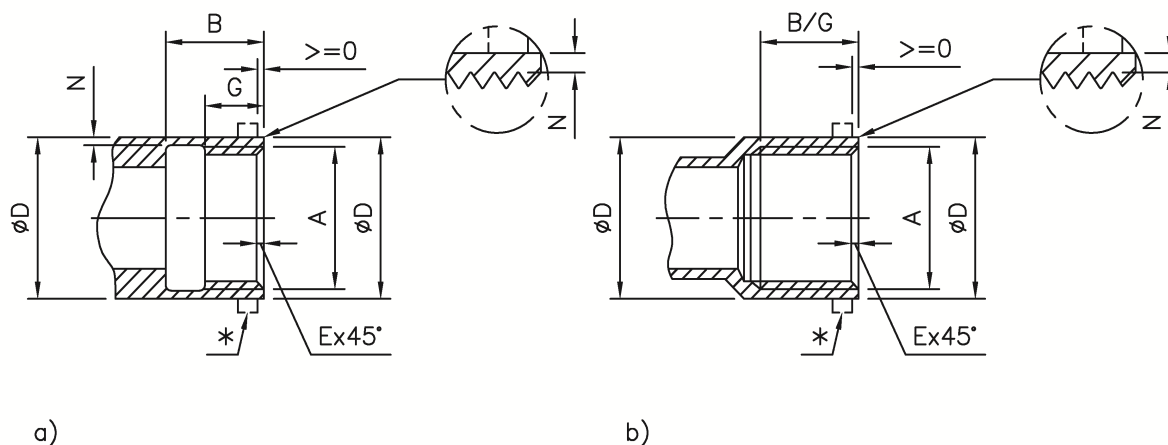
Figure 4 — Internal ISO 7 parallel threads or EN 10226-1

Table 4 — Internal ISO 7 parallel threads or EN 10226-1

Dimensions in millimetres

| A<br>Thread<br>designation                                                                                       | B<br>min. | D Diameter of body/sealing face              |                                           | E <sup>a</sup><br>max. | G<br>min. |
|------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------|-------------------------------------------|------------------------|-----------|
|                                                                                                                  |           | Wrought coppers<br>and copper alloys<br>min. | Cast coppers and<br>copper alloys<br>min. |                        |           |
| Rp 1/8                                                                                                           | 7,4       | 11,6                                         | 11,8                                      | 0,9                    | 4,5       |
| Rp 1/4                                                                                                           | 11,0      | 15,2                                         | 15,4                                      | 1,3                    | 7,0       |
| Rp 3/8                                                                                                           | 11,4      | 19,1                                         | 19,1                                      | 1,3                    | 7,0       |
| Rp 1/2                                                                                                           | 15,0      | 23,8                                         | 23,8                                      | 1,8                    | 9,0       |
| Rp 3/4                                                                                                           | 16,3      | 29,3                                         | 29,7                                      | 1,8                    | 10,0      |
| Rp 1                                                                                                             | 19,1      | 36,3                                         | 36,9                                      | 2,3                    | 11,5      |
| Rp 1 1/4                                                                                                         | 21,4      | 45,6                                         | 46,2                                      | 2,3                    | 13,5      |
| Rp 1 1/2                                                                                                         | 21,4      | 51,4                                         | 52,0                                      | 2,3                    | 13,5      |
| Rp 2                                                                                                             | 25,7      | 63,7                                         | 64,3                                      | 2,3                    | 17,0      |
| Rp 2 1/2                                                                                                         | 30,2      | 80,4                                         | 80,8                                      | 2,3                    | 18,5      |
| Rp 3                                                                                                             | 33,3      | 93,5                                         | 94,0                                      | 2,3                    | 21,0      |
| Rp 4                                                                                                             | 39,3      | 120,0                                        | 121,0                                     | 2,3                    | 26,0      |
| <sup>a</sup> At the option of the manufacturer, as an alternative to chamfer E, the first thread may be removed. |           |                                              |                                           |                        |           |
| NOTE Refer to ISO 7 for thread details not listed in this table.                                                 |           |                                              |                                           |                        |           |

## 4.4.3 Internal EN ISO 228-1 parallel threads

**Key**

- \* optional bead for strength  
 N for minimum wall thickness see Table 1

**Figure 5 — Internal EN ISO 228-1 parallel threads****Table 5 — Internal EN ISO 228-1 parallel threads**

Dimensions in millimetres

| A<br>Thread<br>designation | B<br>min. | D                                            |                                           | E <sup>a</sup><br>max. | G<br>min. |
|----------------------------|-----------|----------------------------------------------|-------------------------------------------|------------------------|-----------|
|                            |           | Wrought coppers and<br>copper alloys<br>min. | Cast coppers and<br>copper alloys<br>min. |                        |           |
| G 1/8                      | 5,6       | 11,6                                         | 11,8                                      | 0,9                    | 4,5       |
| G 1/4                      | 8,0       | 15,2                                         | 15,4                                      | 1,3                    | 7,0       |
| G 3/8                      | 8,5       | 19,1                                         | 19,1                                      | 1,3                    | 7,0       |
| G 1/2                      | 10,5      | 23,8                                         | 23,8                                      | 1,8                    | 9,0       |
| G 3/4                      | 12,0      | 29,3                                         | 29,7                                      | 1,8                    | 10,0      |
| G 1                        | 13,5      | 36,3                                         | 36,9                                      | 2,3                    | 11,5      |
| G 1 1/4                    | 15,5      | 45,6                                         | 46,2                                      | 2,3                    | 13,5      |
| G 1 1/2                    | 15,5      | 51,4                                         | 52,0                                      | 2,3                    | 13,5      |
| G 2                        | 19,0      | 63,7                                         | 64,3                                      | 2,3                    | 17,0      |
| G 2 1/2                    | 20,0      | 80,4                                         | 80,8                                      | 2,3                    | 18,5      |
| G 3                        | 21,0      | 93,5                                         | 94,0                                      | 2,3                    | 20,0      |
| G 4                        | 23,0      | 120,0                                        | 121,0                                     | 2,3                    | 22,0      |

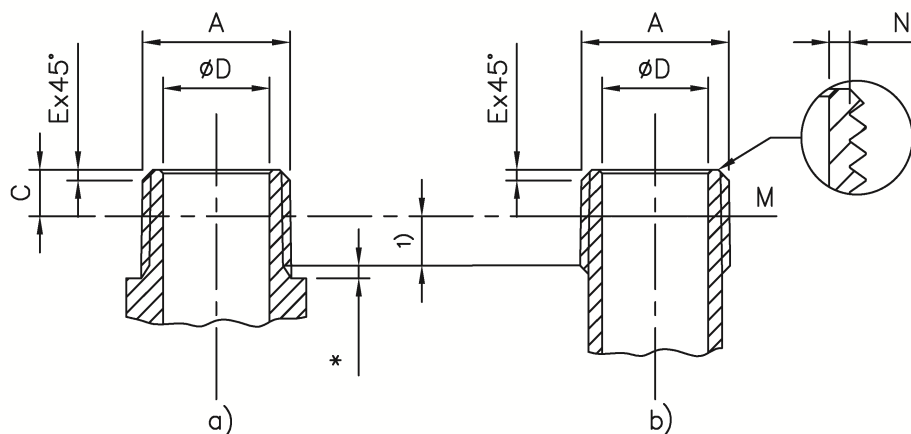
<sup>a</sup> At the option of the manufacturer, as an alternative to chamfer E, the first thread may be removed.

NOTE 1 Fittings without undercut: By agreement between the purchaser and the manufacturer, fittings can be supplied with either dimension B or dimension G [see Figure 5 b)]; designation or identification to be agreed.

NOTE 2 Refer to EN ISO 228-1 for thread details not listed in this table.

It is not recommended to use this thread in connection with external taper threads to ISO 7 because satisfactory performance cannot be guaranteed.

## 4.4.4 External ISO 7 or EN 10226-1 taper threads

**Key**

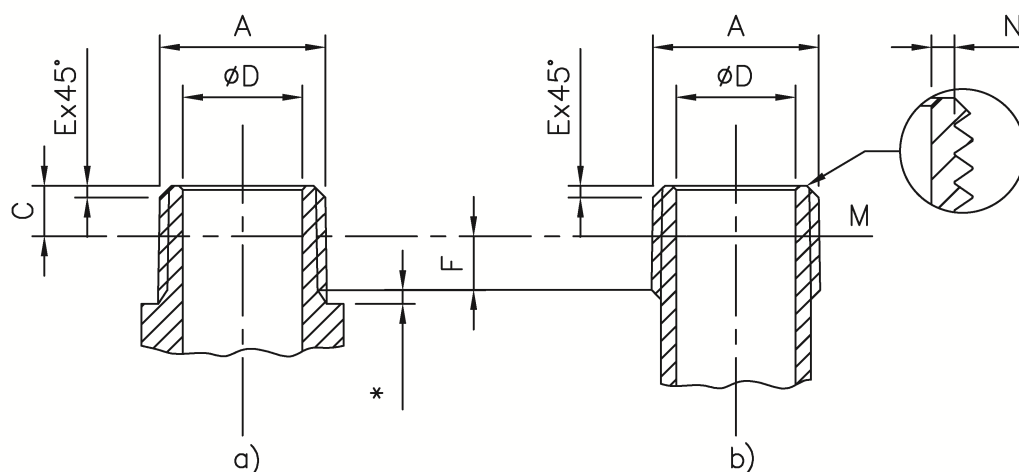
- 1) fitting allowance  
 \* thread runout (or thread undercut if provided) additional to fitting allowance  
 M gauge plane  
 N for minimum wall thickness see Table 1

**Figure 6 — External ISO 7 or EN 10226-1 taper threads****Table 6 — External ISO 7 or EN 10226-1 taper threads**

Dimensions in millimetres

| <i>A</i><br><b>Thread designation</b>                                                                                                              | <i>D</i> <sup>a</sup><br>min. | <i>E</i><br>max. |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------------|
| R 1/8                                                                                                                                              | 4                             | 0,9              |
| R 1/4                                                                                                                                              | 6                             | 1,3              |
| R 3/8                                                                                                                                              | 9                             | 1,3              |
| R 1/2                                                                                                                                              | 10                            | 1,8              |
| R 3/4                                                                                                                                              | 18                            | 1,8              |
| R 1                                                                                                                                                | 23                            | 2,3              |
| R 1 1/4                                                                                                                                            | 29                            | 2,3              |
| R 1 1/2                                                                                                                                            | 36                            | 2,3              |
| R 2                                                                                                                                                | 47                            | 2,3              |
| R 2 1/2                                                                                                                                            | 55                            | 2,3              |
| R 3                                                                                                                                                | 59                            | 2,3              |
| R 4                                                                                                                                                | 75                            | 2,3              |
| <sup>a</sup> For unequal ended or adaptor fittings, the smallest diameter shall apply provided that this diameter does not restrict other outlets. |                               |                  |
| NOTE 1 Refer to ISO 7 or EN 10226-1 for thread details not listed in this table.                                                                   |                               |                  |
| NOTE 2 Fitting allowance and gauge length come from ISO 7-1:1994.                                                                                  |                               |                  |

## 4.4.5 External Rk taper threads (modified ISO 7)

**Key**

- M gauge plane  
 N for minimum wall thickness see Table 1  
 \* thread runout (or thread undercut if provided) additional to dimension  $F$

**Figure 7 — External Rk taper threads (modified ISO 7)****Table 7 — External Rk taper threads (modified ISO 7)**

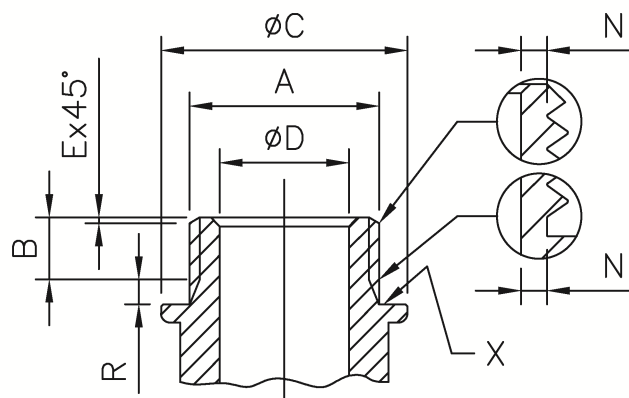
Dimensions in millimetres

| A<br>Thread<br>designation | F   | C<br>Gauge length |      | D <sup>a</sup> | E   |
|----------------------------|-----|-------------------|------|----------------|-----|
|                            |     | min.              | max. |                |     |
| Rk 1/8                     | 1,5 | 2,6               | 4,5  | 4              | 0,6 |
| Rk 1/4                     | 2,3 | 4,0               | 6,6  | 6              | 0,9 |
| Rk 3/8                     | 2,3 | 4,0               | 6,6  | 9              | 0,9 |
| Rk 1/2                     | 3,2 | 4,2               | 8,5  | 10             | 1,2 |
| Rk 3/4                     | 3,2 | 5,4               | 9,5  | 18             | 1,2 |
| Rk 1                       | 4,0 | 5,6               | 10,5 | 23             | 1,5 |
| Rk 1 1/4                   | 4,0 | 6,9               | 12,0 | 29             | 1,5 |
| Rk 1 1/2                   | 4,0 | 8,0               | 12,6 | 36             | 1,5 |
| Rk 2                       | 5,2 | 9,0               | 13,6 | 47             | 1,5 |
| Rk 2 1/2                   | 5,8 | 9,3               | 16,3 | 55             | 1,5 |
| Rk 3                       | 5,8 | 11,0              | 17,0 | 59             | 1,5 |
| Rk 4                       | 6,9 | 14,7              | 21,0 | 76             | 1,5 |

<sup>a</sup> For unequal ended or adaptor fittings, the smallest diameter shall apply provided that this diameter does not restrict other outlets.

NOTE Refer to ISO 7 for thread details not listed in this table.

## 4.4.6 External EN ISO 228-1 parallel threads



## Key

N for minimum wall thickness see Table 1

Figure 8 — External EN ISO 228-1 parallel threads

Table 8 — External EN ISO 228-1 parallel threads

Dimensions in millimetres

| A<br>Thread<br>designation | B <sup>a</sup> |      | C <sup>b</sup> | D <sup>c</sup><br>Wrought<br>or cast<br>coppers<br>and<br>copper<br>alloys | E    | R    |      |
|----------------------------|----------------|------|----------------|----------------------------------------------------------------------------|------|------|------|
|                            | min.           | max. | min.           | min.                                                                       | max. | min. | max. |
| G 1/8 B                    | 4,5            | 6,5  | 11,6           | 4                                                                          | 0,9  | 0,9  | 1,8  |
| G 1/4 B                    | 6,0            | 7,5  | 15,2           | 6                                                                          | 1,3  | 1,3  | 2,6  |
| G 3/8 B                    | 7,0            | 9,0  | 19,1           | 9                                                                          | 1,3  | 1,3  | 2,6  |
| G 1/2 B                    | 7,0            | 8,5  | 23,8           | 10                                                                         | 1,8  | 1,8  | 3,6  |
| G 3/4 B                    | 8,5            | 10,0 | 29,3           | 18                                                                         | 1,8  | 1,8  | 3,6  |
| G 1 B                      | 9,5            | 11,0 | 36,3           | 23                                                                         | 2,3  | 2,3  | 4,6  |
| G 1 1/4 B                  | 11,0           | 12,5 | 45,6           | 29                                                                         | 2,3  | 2,3  | 4,6  |
| G 1 1/2 B                  | 12,5           | 14,0 | 51,4           | 36                                                                         | 2,3  | 2,3  | 4,6  |
| G 2 B                      | 14,0           | 15,5 | 63,7           | 47                                                                         | 2,3  | 2,3  | 4,6  |
| G 2 1/2 B                  | 15,5           | 17,5 | 80,4           | 55                                                                         | 2,3  | 2,3  | 4,6  |
| G 3 B                      | 17,5           | 19,5 | 93,7           | 60                                                                         | 2,3  | 2,3  | 4,6  |
| G 4 B                      | 19,5           | 21,5 | 119,6          | 75                                                                         | 2,3  | 2,3  | 4,6  |

<sup>a</sup> Maximum length may be exceeded for special applications.

<sup>b</sup> If required for a sealing face, face X to be smoothly machined at right angles to the thread axis and with minimum diameter C across the face.

<sup>c</sup> For unequal ended or adaptor fittings, the smallest diameter shall apply provided that this diameter does not restrict other outlets.

NOTE Refer to EN ISO 228-1 for thread details not listed in this table.