INTERNATIONAL STANDARD

ISO 11116-1

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Gas cylinders — 17E taper thread for connection of valves to gas cylinders —

Part 1: Specification

Bouteilles à gaz — Filetages coniques 17E pour le raccordement des robinets sur les bouteilles à gaz —

Partie 1: Spécifications

Reference number
ISO 11116-1:1999(E)

Contents

Page

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 11116-1 was prepared by Technical Committee ISO/TC 58, *Gas cylinders*, Subcommittee SC 2, *Cylinder fittings*.

ISO 11116 consists of the following parts, under the general title *Gas cylinders — 17E taper thread for connection of valves to gas cylinders*:

— *Part 1: Specification*

— *Part 2: Inspection gauges*

Introduction

This part of ISO 11116 belongs to a series of standards specifying thread dimensions and gauge requirements.

Cylinders intended to contain compressed, liquefied or dissolved gas under pressure are fitted with accessories (valves, straight or angle fittings) to allow release of and refilling with, gas. Hereinafter, the term "valve" will apply to such accessories.

The connection, between cylinder and valve, is obtained by assembly of two taper threads, an external one on the valve stem and an internal one in the cylinder neck, each having the same nominal taper, pitch and thread profile.

Gas cylinders — 17E taper thread for connection of valves to gas cylinders —

Part 1:
Specification

1 Scope

This part of ISO 11116 specifies definitions, dimensions and tolerances of a taper screw thread of nominal diameter 17,4 mm (designated 17E), for the connection of valves to medical and industrial gas cylinders.

This part of ISO 11116 does not cover the connection requirements for:

— mechanical strength;

— gas tightness;

— capability of repeated assembly and dismounting operations.

Gauge inspection is covered by ISO 11116-2.

2 Terms and definitions

For the purposes of this part of ISO 11116 the following terms and definitions apply.

2.1
valve stem
tapered end of the valve body, with a thread formed on the external surface of the truncated cone (see Figure 1)

2.2
cylinder neck thread
tapered axial hole in the cylinder neck, with a thread formed on the internal surface of the truncated cone (see Figure 1)

2.3
major cone
cone bounding the crests of the thread of the valve stem, or the roots of the cylinder neck thread

2.4
minor cone
cone bounding the roots of the thread of the valve stem, or the crests of the cylinder neck thread

2.5
pitch cone
cone passing coaxially and midway between the major and minor cones

2.6
reference plane A
reference plane coincident with the small end face of the threaded valve stem and corresponding to diameters d_{1i}, d_{1p}, and d_{1e} (see Figure 1)

2.7
reference plane B
reference plane, at a distance l_1 from reference plane A and corresponding to diameter d_{2p} (see Figure 1)

2.8
reference plane F
reference plane coincident with the entry section face of the cylinder neck thread and corresponding to diameter D_{2p} (see Figure 1)

2.9
reference plane G
reference plane, at a distance L_1 from reference plane F and corresponding to diameter D_{1e}, D_{1p}, and D_{1i} (see Figure 1)

2.10
major diameter
d_{1e}
diameter of the major cone at the valve stem thread reference plane A (before any chamfer is cut) (see Figure 1)

2.11
pitch diameter
d_{1p}
diameter of the pitch cone at the valve stem thread reference plane A (before any chamfer is cut) (see Figure 1)

2.12
minor diameter
d_{1i}
diameter of the minor cone at the valve stem thread reference plane A (before any chamfer is cut) (see Figure 1)

2.13
pitch diameter
d_{2p}
diameter of the pitch cone at reference plane B (see Figure 1)

2.14
major diameter
D_{1e}
diameter of the major cone at reference plane G (see Figure 1)

2.15
pitch diameter
D_{1p}
diameter of the pitch cone at reference plane G (see Figure 1)

2.16
minor diameter
D_{1i}
diameter of the minor cone at reference plane G (see Figure 1)

2.17
pitch diameter
D_{2p}
diameter of the pitch cone at reference plane F (before any chamfer is cut) (see Figure 1)

2.18
reference length
l_1
reference dimension being the distance between the parallel reference planes A and B (see Figure 1)

2.19
reference length
L_1
reference dimension being the distance between the parallel reference planes F and G (see Figure 1)

2.20
length of external thread
l_2
length of full form thread on the valve stem, measured along the cone axis from reference plane A (see Figure 1 and Table 1)

2.21
length of internal thread
L_2
length of full form thread in the cylinder neck, measured along the cone axis from reference plane F (see Figure 1 and Table 2)

2.22
taper
ratio of the difference of two diameters corresponding to planes normal to the axis of the reference cone and the axial distance between the same planes

NOTE Taper can be expressed as a ratio, as an angle or as a percentage.

2.23
thread profile
thread shape obtained, by the intersection of a plane, through the thread axis and the threaded surface.

2.24
basic profile
theoretical profile, when the profile of the external thread coincides with the profile of the internal thread.

2.25
design profile
similar to the basic profile but for the radius of the root, necessary for manufacturing and strength requirements

NOTE Manufacturing tolerances are taken into account for such a profile.

2.26
pitch
P
distance, measured parallel to the cone surface, between two homologous points of two parallel consecutive flanks of the same thread (see Figure 2)

3 Requirements

3.1 Thread rotation

The thread shall be a right hand thread, such that it moves away from an observer, when rotated clockwise.

3.2 Taper

— taper ratio: 3/25;

— taper angle: 6° 52';

— taper slope: 12 %.

3.3 Thread profile

The thread profile is a standard Whitworth form, with a 55° angle. The form and thread height measurements are perpendicular to the cone surface (see Figure 2).

3.4 Pitch, *P*

The pitch is 1,814 mm (derived from $\frac{25,4}{14}$ mm) (see Figure 2).

4 Thread end finish

The thread of the valve stem, may have a chamfer of 2 mm maximum from plane A at the bottom part and a groove at the top (see Figure 1).

The thread of the cylinder neck may have a chamfered opening of 2 mm maximum from plane F (see Figure 1).

5 Identification

Valves and cylinders, threaded in accordance with this part of ISO 11116, shall be identified by the symbol "17E".

Dimensions in millimetres

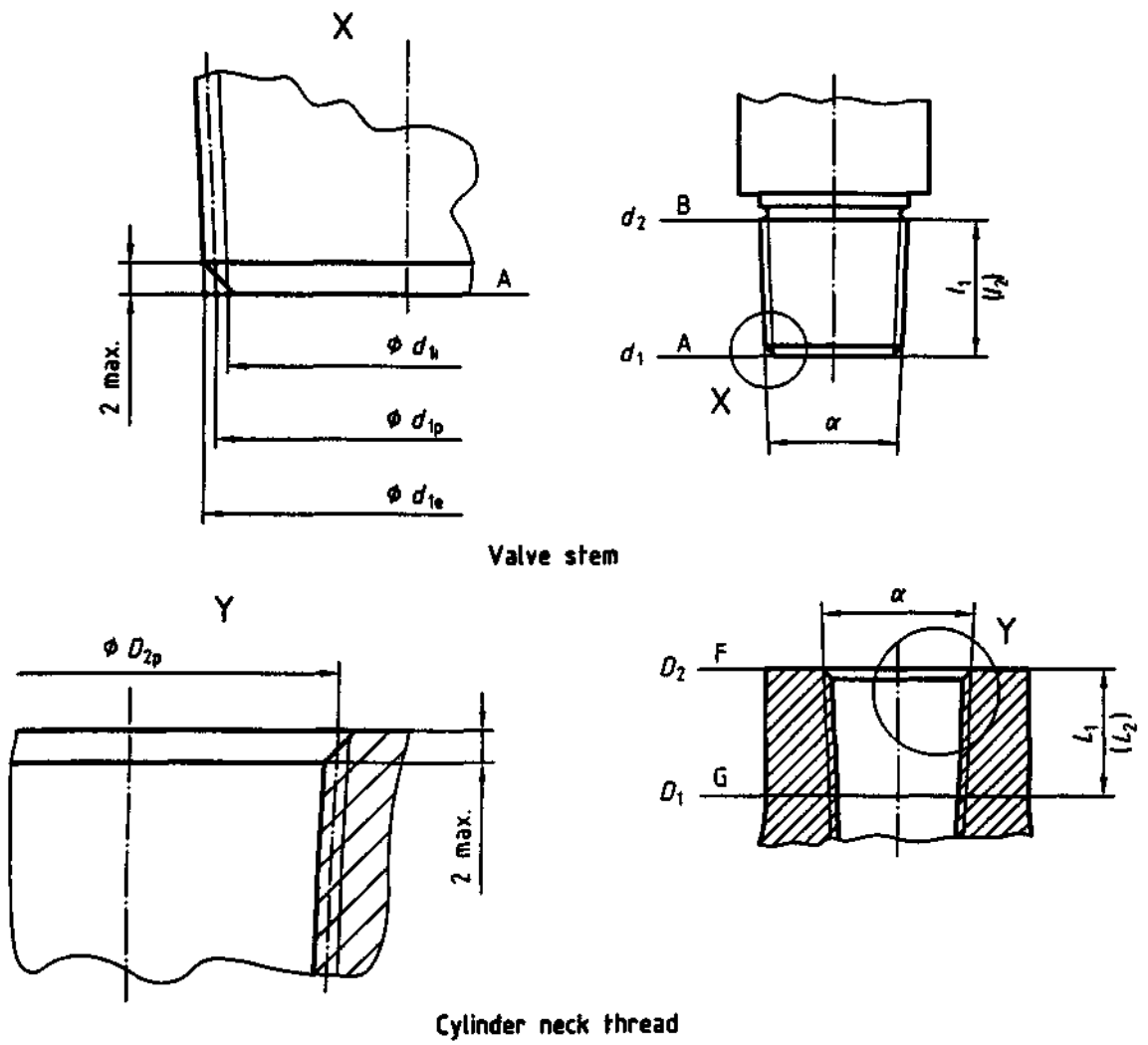


Figure 1 — Thread reference planes and diameters

Table 1 — Valve stem thread dimensions

Dimensions in millimetres

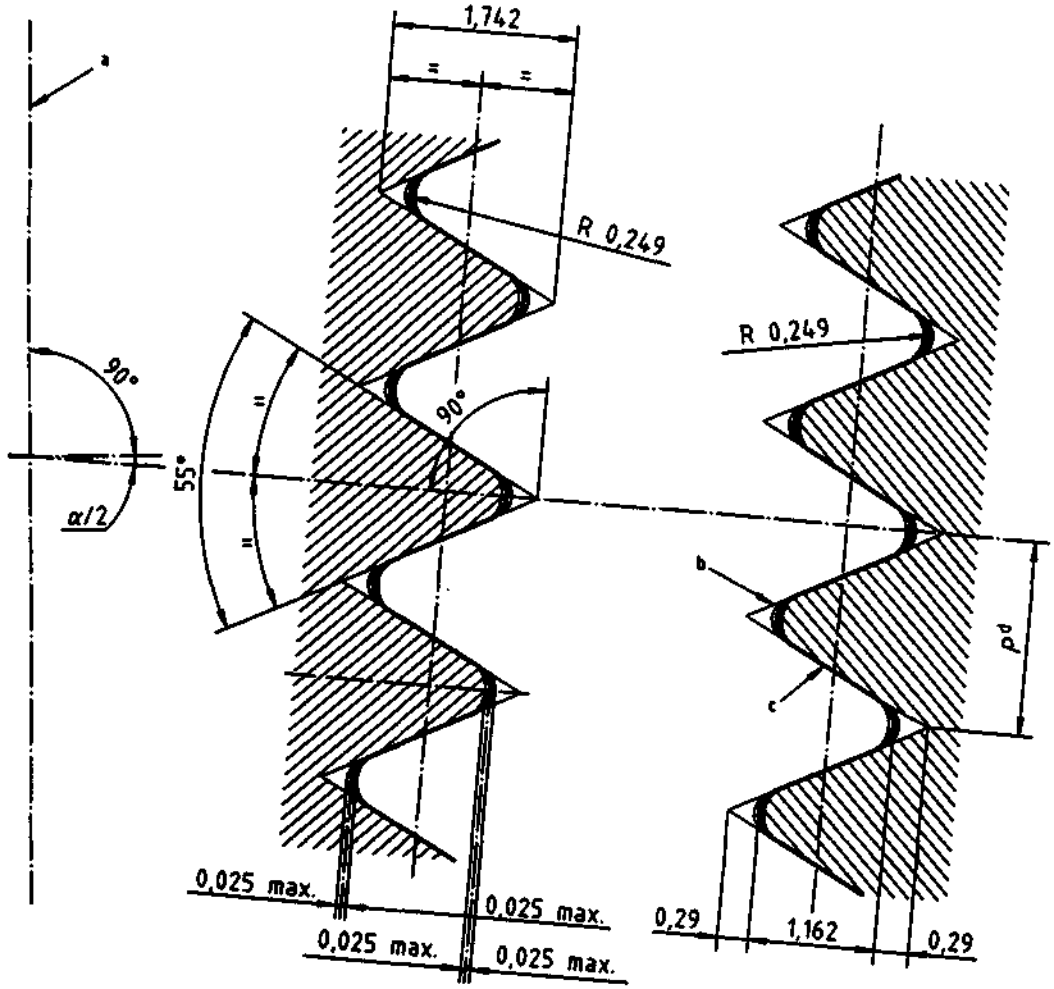
Valve stem	Major diameter d_{1e}	Pitch diameter d_{1p}	Minor diameter d_{1i}	Pitch diameter d_{2p}	Reference length l_1	Full threads length l_2
Dimension	17,28	16,118	14,956	18,638	21	≥ 21
Tolerance	$^{+0,12}_{0}$	$^{+0,12}_{0}$	$^{+0,12}_{0}$	$^{+0,12}_{0}$	—	—

Table 2 — Cylinder neck thread dimensions

Dimensions in millimetres

Cylinder neck thread	Major diameter D_{1e}	Pitch diameter D_{1p}	Minor diameter D_{1i}	Pitch diameter D_{2p}	Reference length L_1	Full threads length L_2
Dimension	17,16	15,998	14,834	18,038	17	≥ 17
Tolerance	$^{0}_{-0,12}$	$^{0}_{-0,12}$	$^{0}_{-0,12}$	$^{0}_{-0,12}$	—	—

Dimensions in millimetres



a Cone axis

b Basic profile

c Design profile

d Pitch

Figure 2 — Thread profiles

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