INTERNATIONAL STANDARD

ISO 15245-1

First edition
2001-10-15

Gas cylinders — Parallel threads for connection of valves to gas cylinders —

Part 1: **Specification**

Bouteilles à gaz — Filetages parallèles pour le raccordement des robinets sur les bouteilles à gaz —

Partie 1: Spécifications

Reference number
ISO 15245-1:2001(E)

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Printed in Switzerland

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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.

Attention is drawn to the possibility that some of the elements of this part of ISO 15245 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 15245-1 was prepared by Technical Committee ISO/TC 58, *Gas cylinders*, Subcommittee SC 2, *Cylinder fittings*.

ISO 15245 consists of the following parts, under the general title *Gas cylinders — Parallel threads for connection of valves to gas cylinders*:

— *Part 1: Specification*

— *Part 2: Gauge inspection*

Introduction

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” applies to such accessories.

The connection between cylinder and valve is obtained by the assembly of two parallel threads with the same nominal pitch and thread profile – an external one on the valve stem and an internal one in the cylinder neck – and an “O” ring seal.

Gas cylinders — Parallel threads for connection of valves to gas cylinders —

Part 1: Specification

1 Scope

This part of ISO 15245 specifies definitions, dimensions and tolerances of parallel screw threads of nominal diameter 30 mm (designated 30P), 25 mm (designated 25P) and 18 mm (designated 18P), for the connection of valves to medical and industrial gas cylinders.

This part of ISO 15245 does not cover the connection requirements for:

— mechanical strength;

— gas tightness;

— capability of repeated assembly and dismounting operations[1)].

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 15245. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 15245 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 68-1, *ISO general purpose screw threads — Basic profile — Part 1: Metric screw threads*

ISO 261, *ISO general-purpose metric screw threads — General plan*

ISO 724, *ISO general-purpose metric screw threads — Basic dimensions*

ISO 965-1, *ISO general-purpose metric screw threads — Tolerances — Part 1: Principles and basic data*

ISO 965-2, *ISO general purpose metric screw threads — Tolerances — Part 2: Limits of sizes for general purpose external and internal screw threads — Medium quality*

ISO 11114-2, *Transportable gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 2: Non-metallic materials*

1) This aspect is covered in ISO 13341.

3 Terms and definitions

General definitions for parallel threads can be found in ISO 5408.

For the purposes of this part of ISO 15245, the following terms and definitions apply.

3.1
valve stem
parallel sided end of valve body, with a thread formed on the external surface with a plain machined section close to the flange on the valve body for “O” ring seating

See Figure 1, thread *X*.

3.2
cylinder neck thread
A
parallel sided axial hole in the cylinder neck

See Figure 2.

NOTE This includes a thread formed on the internal surface including a sealing recess for the “O” ring and thread relief.

3.3
sealing recess diameter
B
diameter of tapered recess machined in the top face of the cylinder neck, concentric with the cylinder neck thread, to provide a surface on which the “O” ring can seal

See Figure 2.

3.4
sealing recess depth
F
depth of tapered recess machined in the top face of the cylinder neck, concentric with the cylinder neck thread, to provide a surface on which the “O” ring can seal

See Figure 2.

3.5
thread relief
C
diameter of plain machined parallel sided section, concentric with the cylinder neck thread, between the cylinder neck thread and the sealing recess

See Figure 2.

3.6
distance to start of thread
E
distance from the top face of the cylinder neck to the start of the thread, including recess depth and thread relief

See Figure 2.

3.7
thread relief
V
minimum length of plain machined parallel sided section on the valve stem, between the valve stem thread and the flange on the valve body, on to which the “O” ring can seal

See Figure 1.

3.8
minimum full thread length
D
minimum distance from the top face of the cylinder neck to the bottom of the cylinder neck thread

See Figure 2.

3.9
“O” ring diameter
R
internal diameter of seal used to prevent unintentional escape of gas from the cylinder

See Figure 3.

3.10
“O” ring thickness
W
width of cross section of seal used to prevent unintentional escape of gas from the cylinder

See Figure 3.

3.11
flange
Y
minimum diameter of the flange on the valve body which seals on to the “O” ring and the top face of the cylinder neck

See Figure 1.

3.12
length of valve stem
Z
distance from the flange on the valve body to the bottom of the valve stem thread

See Figure 1.

3.13
vent groove (optional)
G
groove(s) which are machined in the valve stem thread such that any residual pressure within the cylinder will be vented when the valve is unscrewed

See Figure 4.

NOTE Such grooves need to have smooth edges in order to ensure that they do not damage the cylinder threads during insertion or removal of valves.

4 Requirements

4.1 Thread rotation

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

4.2 Thread profile

The thread profile is standard ISO form (see ISO 68-1) with a 60° angle. The form and thread height measurements are perpendicular to the axis of the thread.

4.3 Pitch

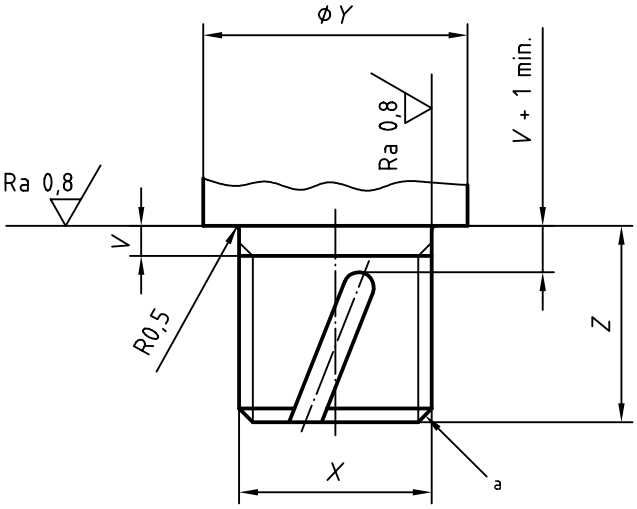
The pitches are as follows:

— M18: 1,5 mm (see ISO 724);

— M25: 2 mm (see ISO 724);

— M30: 2 mm (see ISO 724).

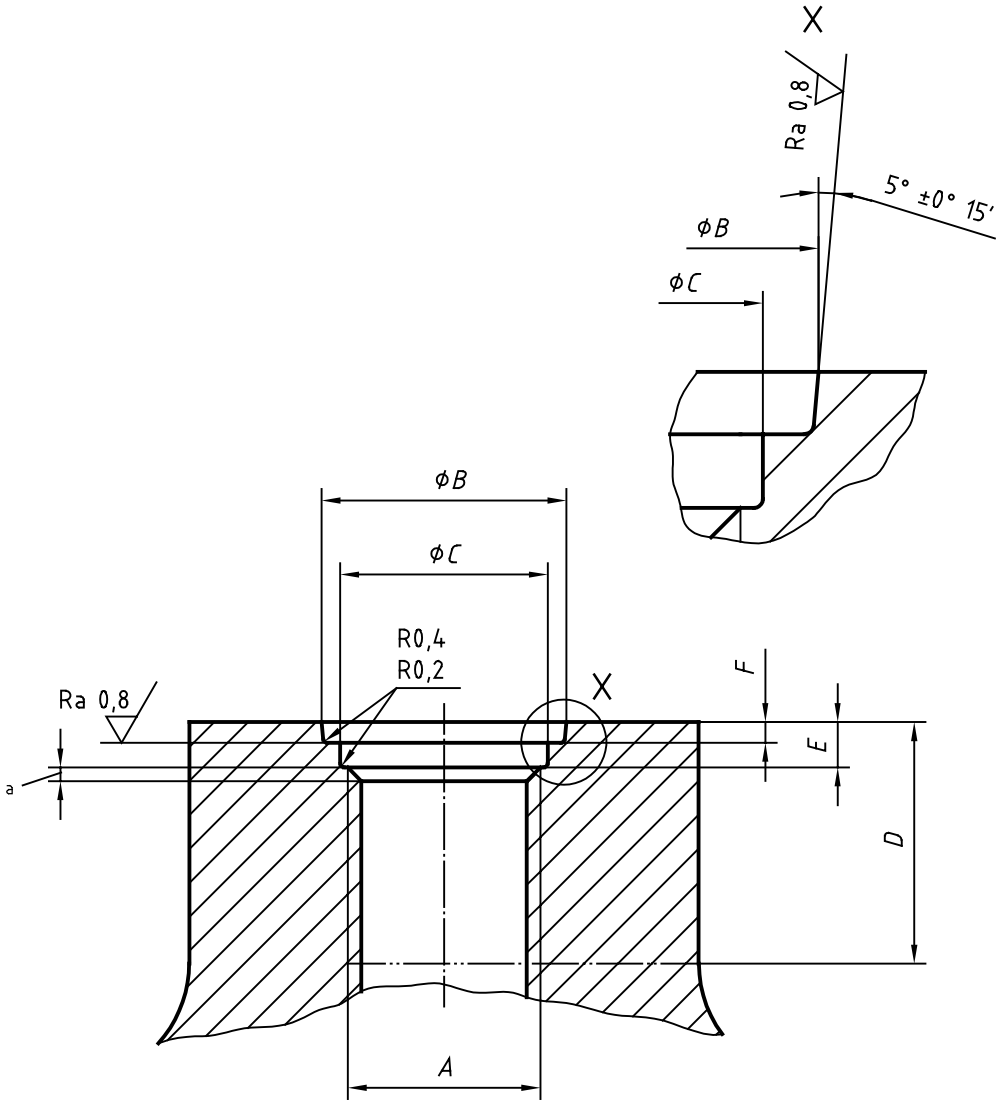
Dimensions in millimetres
surface roughness values in micrometres



a Chamfer 45° × root diameter.

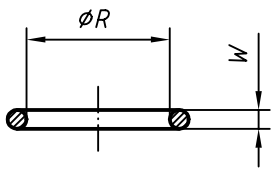
Figure 1 — Valve body stem

Dimensions in millimetres
surface roughness values in micrometres



a Chamfer 45 ° × root diameter.

Figure 2 — Cylinder neck



where

R is the internal diameter of the “O” ring;

W is the thickness of the “O” ring.

Figure 3 — “O” ring

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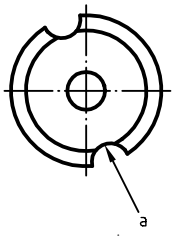

a Maximum groove depth, G, 1 mm below root diameter of thread

Figure 4 — Optional vent groove details (maximum 2)

4.4 Thread dimensions

The dimensions of the valve stem threads, cylinder neck threads and “O” rings are shown in Tables 1, 2 and 3 respectively.

The “O” ring shall have a hardness of 90 shore A (nominal) and shall be of a material compatible with the nature of the gas contained in the cylinder (see ISO 11114-2).

5 Thread end finish

The thread on the valve stem shall have a chamfer at 45° at the bottom end (see Figure 1).

The thread in the cylinder neck shall have a chamfer at 45° at its opening (see Figure 2).

6 Identification

Valves and cylinders threaded in accordance with this part of ISO 15245 shall be identified by the symbol “18P” for the M18 × 1,5 thread, “25P” for the M25 × 2 thread and “30P” for the M30 × 2 thread.

Table 1 — Valve stem dimensions

Dimensions in millimetres

Stem thread	**Flange diameter**	**Length of valve stem**		**Thread relief**
X	Y	Z		V
	min.	min.	max.	min.
M18 × 1,5 – 6g	28	22	24	2,5
M25 × 2,0 – 6g	35	25	27	3,5
M30 × 2,0 – 6g	43	25	30	3,5

NOTE 1 Thread form conforms to ISO 68-1. Diameter and pitch are chosen from ISO 261 and ISO 724 and tolerances from ISO 965-1 and ISO 965-2.

NOTE 2 Maximum value of V is compatible with X thread run out.

Table 2 — Cylinder neck and thread dimensions

Dimensions in millimetres

Neck thread	Recess diameter *B*		Thread relief diameter	Minimum full thread length	Sealing recess depth	Distance to start of thread
A	min.	max.	*C*	*D*	*F*	*E*
M18 × 1,5 – 6H	23,66	23,83	$18^{+0,63}_{+0,33}$	24	$1,9^{+0,4}_{0}$	5,5 ± 0,5
M25 × 2,0 – 6H	32,28	32,53	$25^{+0,63}_{+0,33}$	27	$2,7^{+0,5}_{0}$	6,5 ± 0,5
M30 × 2,0 – 6H	37,28	37,53	$30^{+0,63}_{+0,33}$	30	$2,7^{+0,5}_{0}$	8 ± 0,5

NOTE 1 Thread form conforms to ISO 68-1. Diameter and pitch are chosen from ISO 261 and ISO 724 and tolerances from ISO 965-1 and ISO 965-2.

NOTE 2 *E* is compatible with maximum value of *V* and *X* thread run out (see Table 1).

Table 3 — "O" ring dimensions

Dimensions in millimetres

Thread	Internal diameter *R*	Thickness *W*
M18 × 1,5 – 6H	18 ± 0,21	2,65 ± 0,1
M25 × 2,0 – 6H	25 ± 0,25	3,55 ± 0,1
M30 × 2,0 – 6H	30 ± 0,29	3,55 ± 0,1

Bibliography

[1] ISO 5408, *Cylindrical screw threads — Vocabulary*

[2] ISO 13341, *Transportable gas cylinders — Fitting of valves to gas cylinders*

ICS 23.020.30

Price based on 8 pages