INTERNATIONAL STANDARD

ISO 11191

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Gas cylinders — 25E taper thread for connection of valves to gas cylinders — Inspection gauges

Bouteilles à gaz — Filetages coniques 25E pour le raccordement des robinets sur les bouteilles à gaz — Calibres de vérification

Reference number
ISO 11191:1997(E)

Contents

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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.

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 11191 was prepared by Technical Committee ISO/TC 58, *Gas cylinder*, Subcommittee SC 2, *Cylinder fittings*.

Annexes A and B of this International Standard are for information only.

Introduction

This International Standard belongs to a series of standards specifying thread dimensions and gauge requirements.

Gas cylinders — 25E taper thread for connection of valves to gas cylinders — Inspection gauges

1 Scope

This International Standard specifies types, dimensions and principles of use of gauges, to be used in conjunction with the taper thread specified in ISO 10920.

Annex A provides examples of calculations for thread gauge dimensions on the large end diameter.

Annex B draws attention to the limitations of the gauging system specified.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 10920:1997, *Gas cylinders — 25E taper thread for connection of valves to gas cylinders — Specification.*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 inspection gauge: Gauge used for routine checking of cylinder neck and valve stem threads.

NOTE — This gauge is not used for checking other gauges.

3.2 check gauge: Gauge for checking dimensional conformity of inspection ring gauges.

NOTE — This gauge is not used for checking cylinder neck threads.

3.3 single-part gauge: Gauge of sufficient length to contact the full length of taper thread.

NOTE — These gauges may be plug or ring, plain or threaded.

3.4 two-part gauges: Two separate inspection gauges, used in combination, where one is used to contact the large end of the taper cone and the other the small end.

NOTE — These sets of gauges may be plug or ring, plain or threaded.

4 Requirements

4.1 Materials

All gauges shall be manufactured from material of suitable strength, stability and hardness.

4.2 Thread profile

The thread profile of threaded inspection and check gauges shall be as shown in figure 1.

The thread profile shall have a 55° angle. The form and thread height measurements shall be perpendicular to the cone surface (see figure 1).

4.3 Thread rotation

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

4.4 Thread

The thread shall satisfy the following requirements:

— ratio: 3/25;
— angle: 6° 52′;
— taper: 12 %.

4.5 Pitch, P

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

5 Gauge dimensions

The following dimensional requirements apply to gauges shown in figures 2 to 15 inclusive.

5.1 All dimensions are given in millimetres.

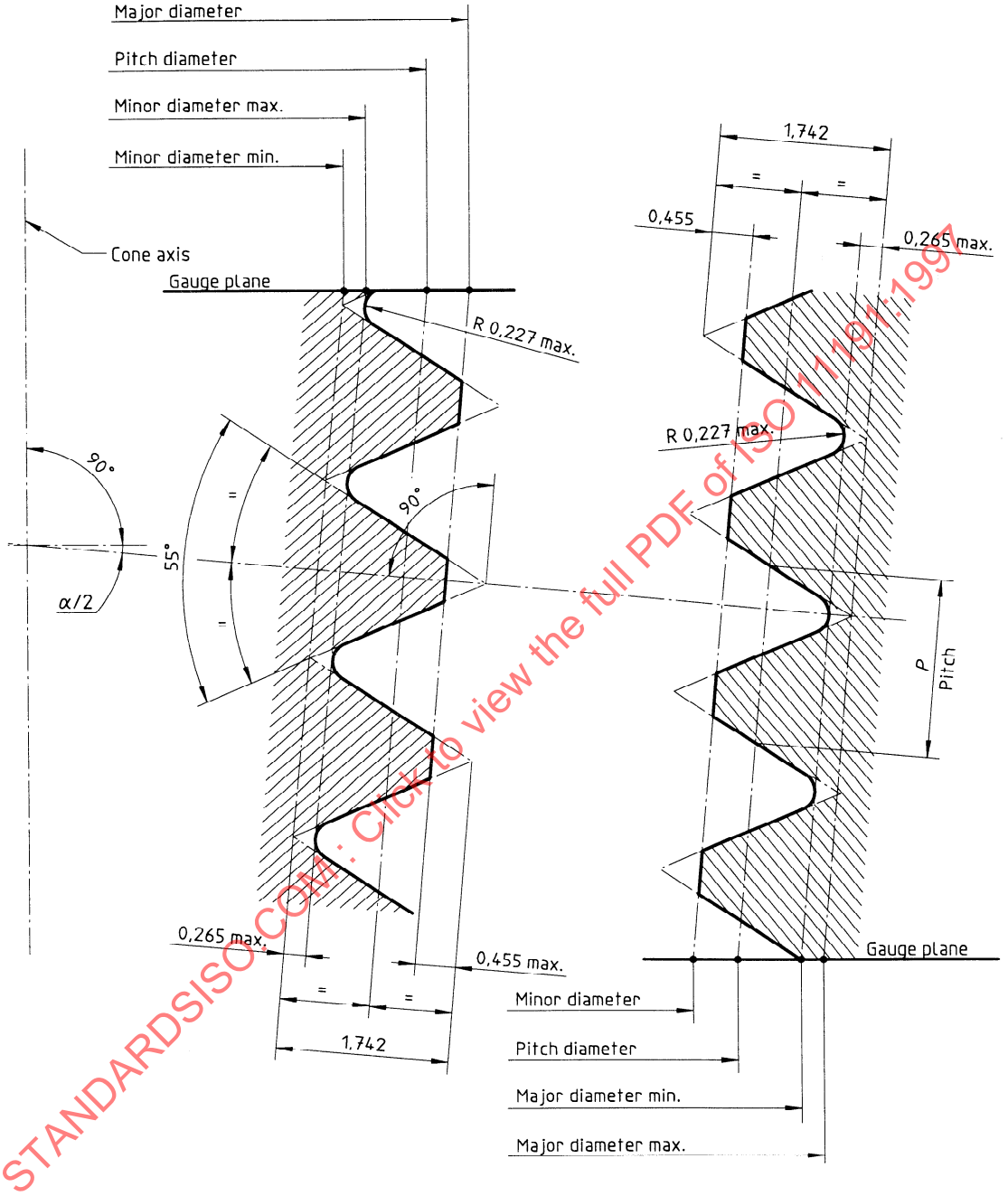
5.2 Tolerances for specified dimensions on all gauges are:

a) ± 0,01 mm on all lengths;
b) ± 0,01 mm on diameters of inspection gauges;
c) $^{-\ 0,01}_{-\ 0,02}$ mm on diameters of check gauges.

5.3 For threaded gauges, pitch diameters only are specified. For minor and major diameters see figure 1.

5.4 Unspecified dimensions shall be chosen by the manufacturer of the gauges.

Dimensions in millimetres



a) Plug gauge thread profile

b) Ring gauge thread profile

Figure 1 — Thread profiles

6 Inspection gauges

All dimensions are given in millimetres.

6.1 Cylinder neck thread

6.1.1 Single-part plug gauges

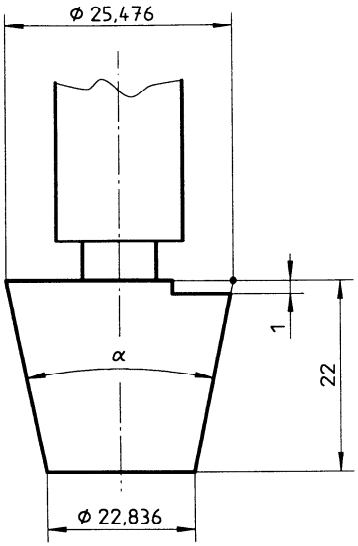


Figure 2 — Plain gauge for minor diameters "l-1"

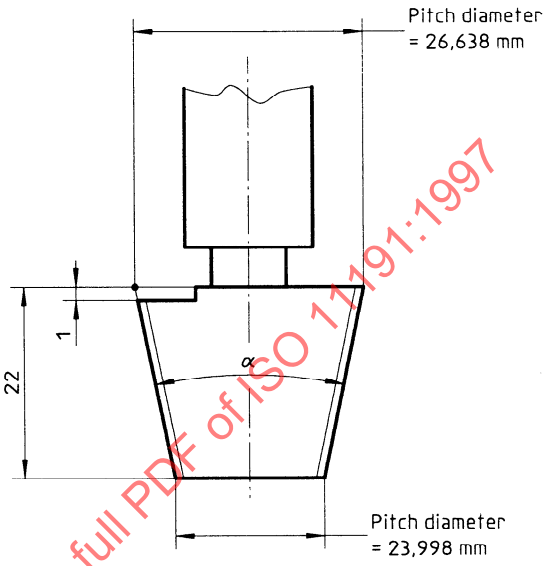


Figure 3 — Threaded gauge for pitch diameters "l-2"

6.1.2 Two part-plug gauges — small end diameter

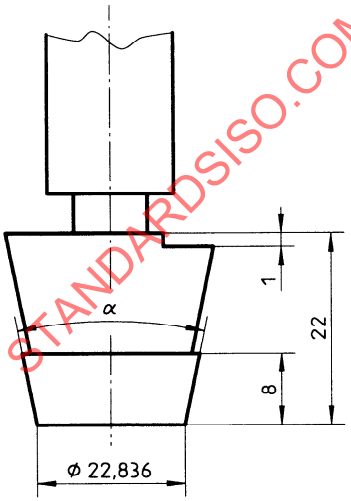


Figure 4 — Plain gauge for minor diameters "l-3"

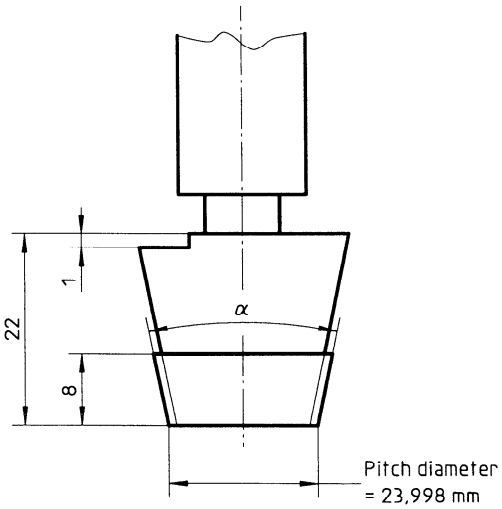


Figure 5 — Threaded gauge for pitch diameters "l-4"

6.1.3 Two-part plug gauges — large end diameter

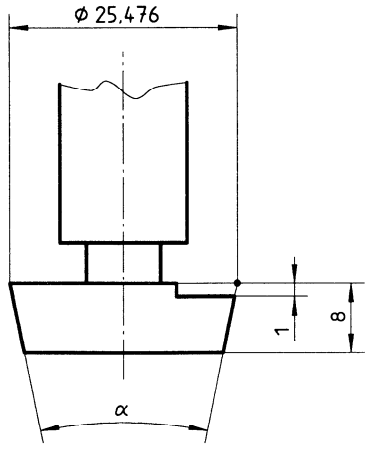


Figure 6 — Plain gauge
for minor diameters "l-5"

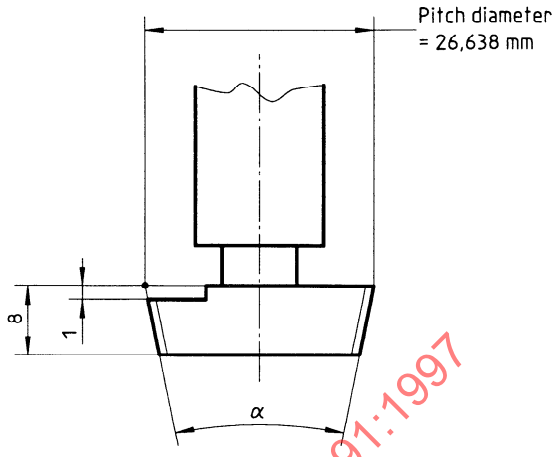


Figure 7 — Threaded gauge
for pitch diameters "l-6"

6.2 Valve stem thread

6.2.1 Single-part ring gauges

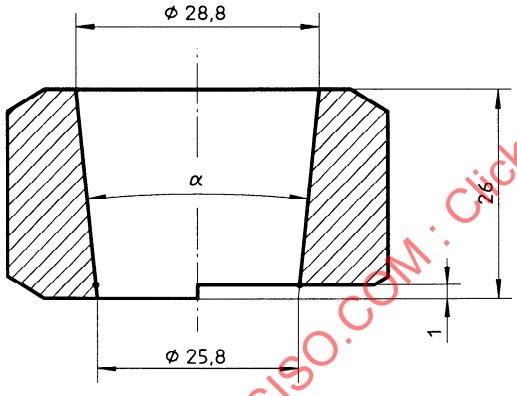


Figure 8 — Plain ring gauge
for major diameters "l-7"

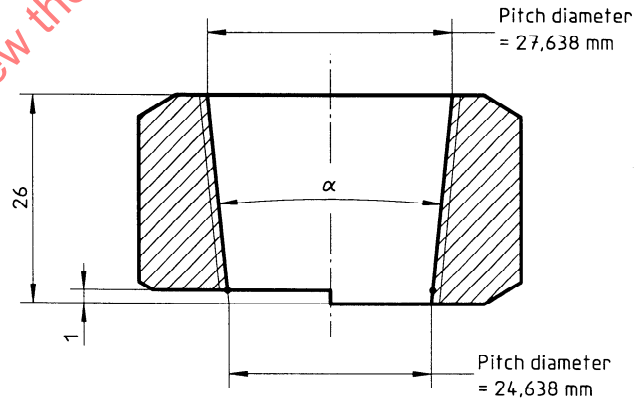


Figure 9 — Threaded ring gauge
for pitch diameters "l-8"

6.2.2 Two-part ring gauges — small end diameter

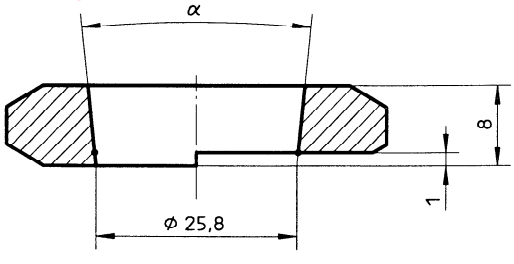


Figure 10 — Plain ring gauge
for major diameters "l-9"

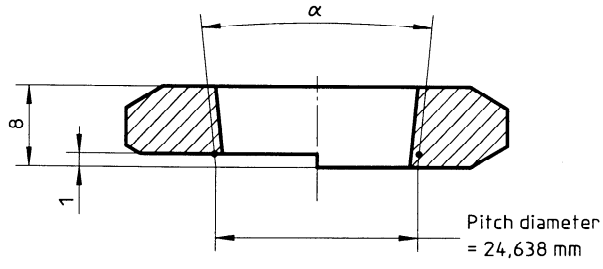


Figure 11 — Threaded ring gauge
for pitch diameters "l-10"

6.2.3 Two-part ring gauges — large end diameter

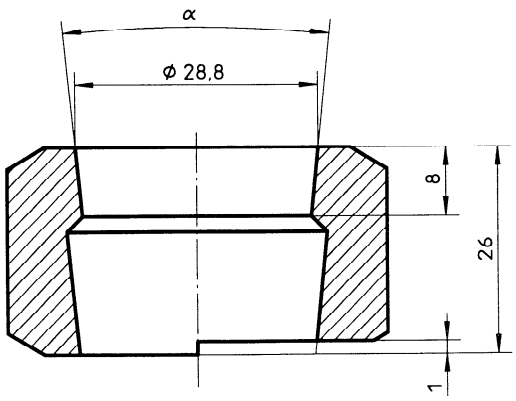


Figure 12 — Plain ring gauge for major diameters "I-11"

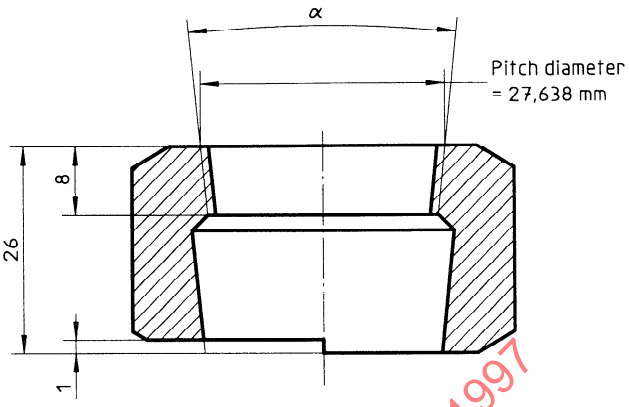


Figure 13 — Threaded ring gauge for pitch diameters "I-12"

6.3 Check gauges

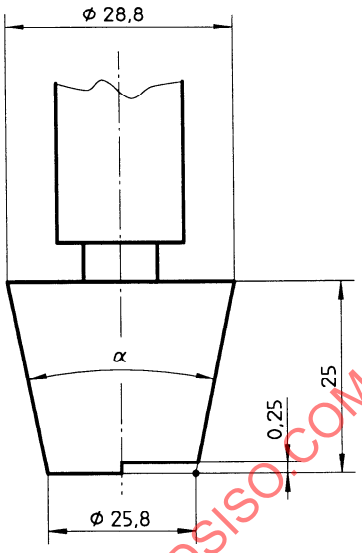


Figure 14 — Plain check gauge "M-1"

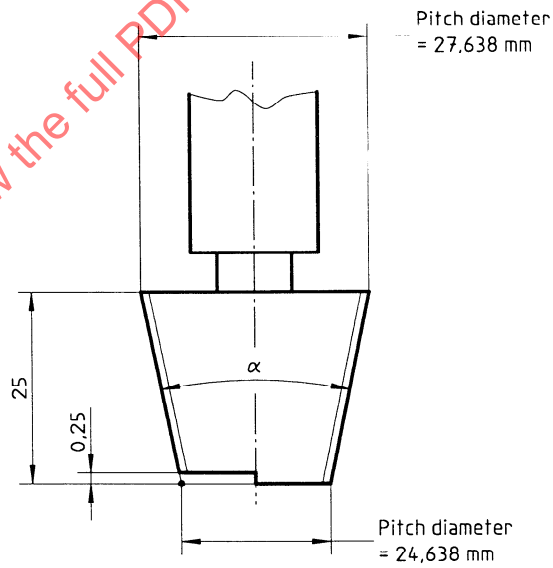


Figure 15 — Threaded check gauge "M-2"

7 Use of inspection gauges

7.1 Plain gauges

Plain gauges shall be lightly pressed into position or over the thread being gauged. Undue force shall not be used.

7.2 Threaded gauges

Threaded gauges shall be screwed into or over the thread being gauged. Undue force shall not be used.

7.3 Acceptance or rejection criteria, using plug gauges

Thread acceptability to gauge is determined by the position of the plane at the mouth of the cylinder neck relative to the test surfaces of the gauge.

The thread shall be considered acceptable to the gauge if this plane is flush with or falls between the test surfaces if the gauge when the gauge is fitted to the thread (see figures 16 and 17).

7.4 Acceptance or rejection criteria, using ring gauges

Thread acceptability to gauge is determined by the position of the plane at the flat small end of the stem cone base relative to the test surfaces of the gauge.

The thread shall be considered acceptable to the gauge if this plane is flush with or falls between the test surfaces of the gauge when the gauge is fitted to the thread (see figures 18 and 19).

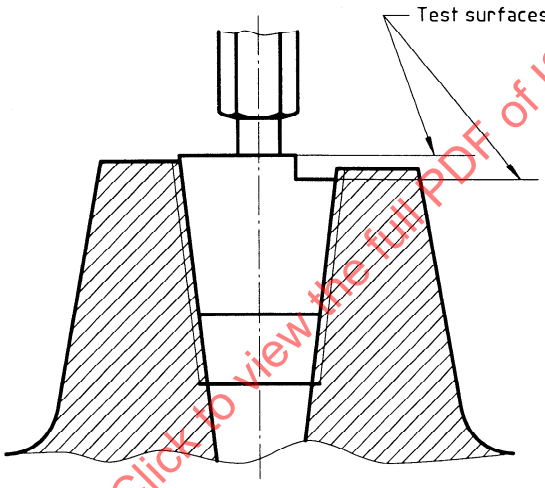


Figure 16 — Use of single-part plug gauge

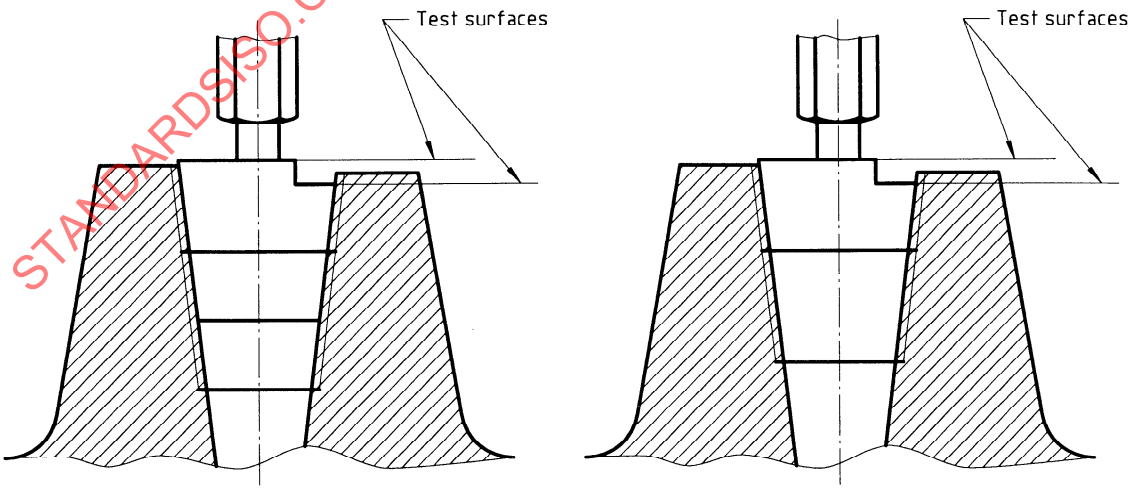


Figure 17 — Use of two-part plug gauge

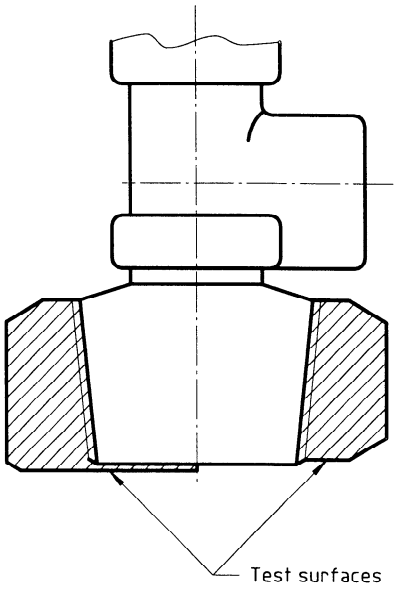


Figure 18 — Use of single-part ring gauge

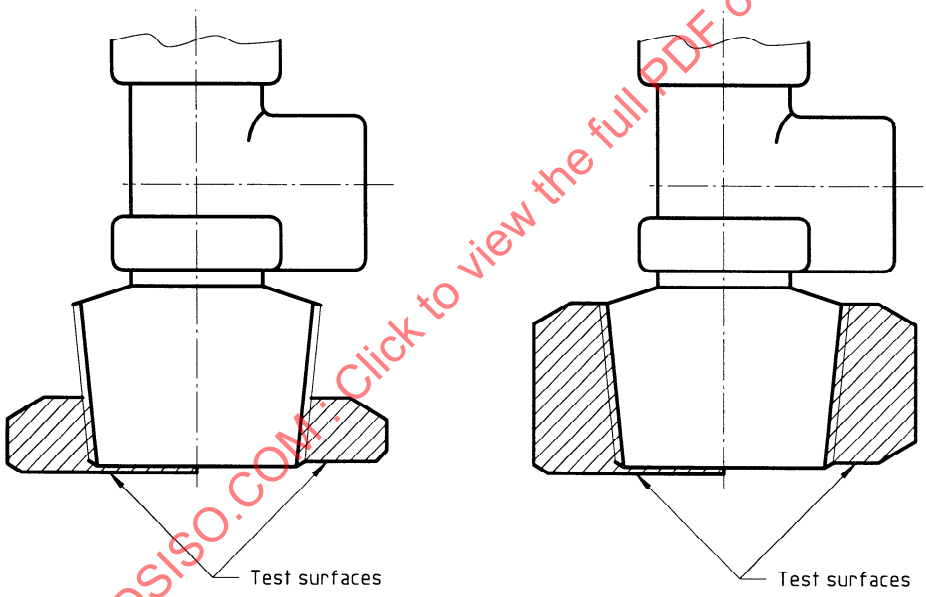


Figure 19 — Use of two-part ring gauge

8 Verification of inspection gauges

8.1 General

During use, inspection gauges will wear and can be damaged. The user shall ensure that the gauges are checked regularly to ensure that they remain within the specified dimensions. Frequency of checks required ensure will depend upon usage and shall be the responsibility of the user.

8.2 Plug gauges

Verification of inspection plug gauges shall be carried out directly, using optical or other suitable equipment.

8.3 Ring gauges

Verification of inspection ring gauges cannot be carried out directly. Two check plug gauges, as shown in figures 14 and 15, shall be used.

8.4 Use of check gauges

The plain check plug gauge shall be placed in the plain inspection ring gauge and the threaded check plug gauge shall be screwed into the threaded inspection ring gauge. The inner stepped surface of the inspection ring gauge test surface, shall be flush with, or within either of, the two test surfaces of the check gauge (see figure 20). Undue force shall not be used.

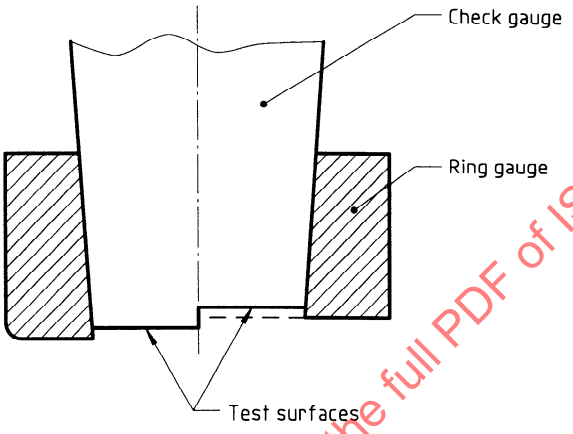


Figure 20 — Use of check gauges

9 Identification

9.1 Inspection gauges

Inspection gauges shall be identified by the following information:

— «ISO 11191»;
— «25E»;
— «I-» (followed by the appropriate number of the gauge, e.g. «I-3»).

9.2 Check gauges

Check gauges shall be identified by the following information:

— «ISO 11191»;
— «25E»;
— «M-» (followed by the appropriate number of the gauge, e.g. «M-2»).

Annex A
(informative)

Examples of calculation for thread gauge dimensions on the large end diameter

In the following examples the mid allowable value for pitch diameter is used. In practice the true pitch diameter is determined and used for calculation.

All dimensions are given in millimetres

A.1 Threaded plug gauge "I-2" according to figure 3

Thread profile in accordance with figure 1.

Pitch diameter:	26,638; tolerance: ± 0,01
Major diameter:	26,638 + 1,742 + (2 × 0,455) = 27,47; tolerance: ± 0,01
Minor diameter, theoretical, crest (Minor diameter — Minimum dimension):	26,638 – 1,742 = 24,896
Minor diameter — Maximum dimension:	26,638 – 1,742 + (2 × 0,265) = 25,426

A.2 Threaded ring gauge "I-8" according to figure 9

Thread profile in accordance with figure 1.

Pitch diameter:	27,638; tolerance: ± 0,01
Minor diameter:	27,638 – 1,742 + (2 × 0,455) = 26,806; tolerance: ± 0,01
Major diameter, theoretical, crest (Major diameter — Maximum dimension):	27,638 + 1,742 = 29,38
Major diameter — Minimum dimension:	27,638 + 1,742 – (2 × 0,265) = 28,85

A.3 Threaded check gauge "M-2" according to figure 15

Thread profile in accordance with figure 1.

Pitch diameter:	27,638; tolerance: $^{-\ 0,01}_{-\ 0,02}$
Major diameter:	27,638 + 1,742 – (2 × 0,455) = 28,47; tolerance: $^{-\ 0,01}_{-\ 0,02}$
Minor diameter, theoretical, crest (Minor diameter — Minimum dimension):	27,638 – 1,742 = 25,896
Minor diameter — Maximum dimension:	27,638 – 1,742 + (2 × 0,265) = 26,426

Annex B
(informative)

Limitations of gauging system

B.1 The purpose of this annex is to draw attention to the limitations of the gauging system specified in this standard.

Taper threads are more difficult to gauge than parallel threads. It is not practical to provide a gauging system which will gauge all aspects of a taper thread.

B.2 The gauging system specified in the main text of this International Standard is considered to be the minimum practical gauging, for the verification of the dimensions of a taper thread.

The gauges specified in this International Standard do not check the following aspects of taper threads.

— out of tolerance on minor diameter on the stem;
— out of tolerance on major diameter on the neck;
— ovality on threads;
— die withdrawal lines;
— surface finish;
— "waisting" of the taper form.

B.3 Any of the points listed in B.2 could cause difficulties in achieving a gas tight seal in service.

If difficulties are experiences in service, it is recommended that additional gauging and/or inspection techniques be used to investigate the aspect listed in B.2. Optical visual techniques can often be used.

B.4 Another useful inspection technique which can be applied to stem threads is to modify a pair of single-part ring gauges (see 6.2.1) by removing a 90° segment. This allow necked eye examination of the thread for mating with the gauge and is effective in highlighting "waisting" or other errors in the taper form. Examples of this type of gauge are given in figure B.1.

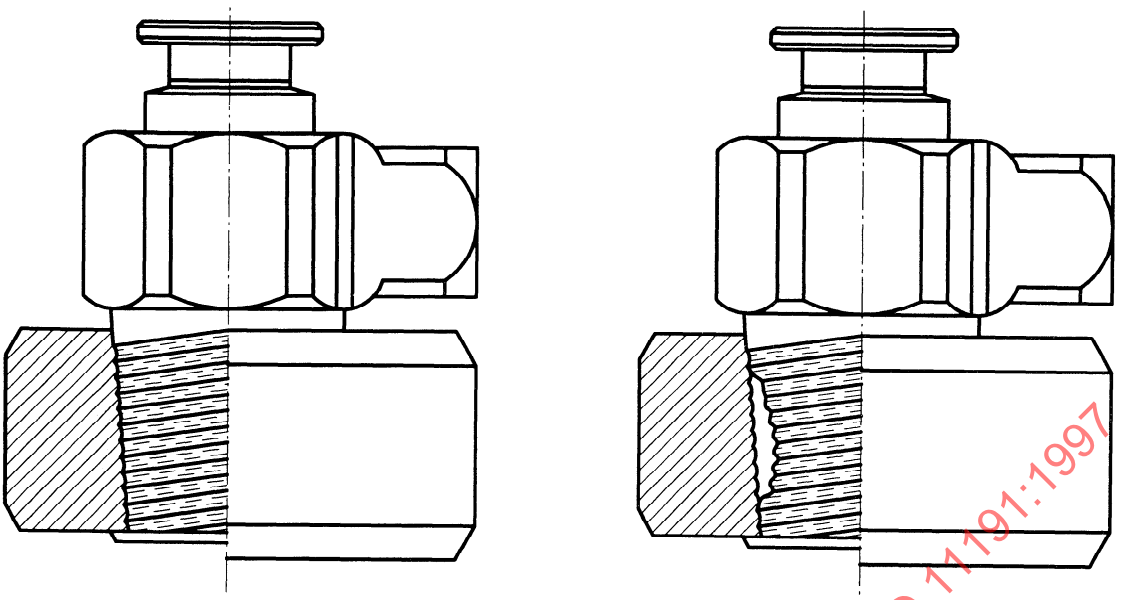


Figure B.1 — Example of single-part ring gauge with 90° segment removed