SLOVENSKI STANDARD
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Cevni navoji za zveze, ki tesnijo z navoji – 3. del: Kontrola s kalibri

Pipes threads where pressure tight joint are made on the threads - Part 3: Verification by means of limit gauges

Rohrgewinde für im Gewinde dichtende Verbindungen - Teil 3: Prüfung mit Grenzlehren

Filetage de tuyauteries pour raccordement avec étanchéité par le filetage - Partie 3: Vérification par calibres a limites

Ta slovenski standard je istoveten z: **EN 10226-3:2005**

ICS:

21.040.30	Posebni navoji	Special screw threads

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EUROPEAN STANDARD

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English version

Pipes threads where pressure tight joint are made on the threads - Part 3: Verification by means of limit gauges

Filetage de tuyauteries pour raccordement avec étanchéité par le filetage - Partie 3: Vérification par calibres à limites

Rohrgewinde für im Gewinde dichtende Verbindungen - Teil 3: Prüfung mit Grenzlehren

This European Standard was approved by CEN on 22 December 2004.

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Contents

Foreword

This document (EN 10226:2005) has been prepared by ECISS/TC 29 “Steel tubes and fittings for steel tubes”, the secretariat of which is held by UNI.

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of an identical text or by endorsement, at the latest by August 2005, and conflicting national standards shall be withdrawn at the latest by August 2005.

This document is based, with editorial modification, on ISO 7-2: *Pipe threads where pressure-tight joints are made on the threads – Part 2: Verification by means of limit gauges.*

EN 10226 consists of the following parts, under the general title *Pipe threads where pressure-tight joints are made on the threads*:

— *Part 1: Taper external threads and parallel internal threads - Dimensions, tolerances and designation*

— *Part 2: Taper external threads and taper internal threads - Dimensions, tolerances and designation*

— *Part 3: Verification by means of limit gauges*

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

1 Scope

This document specifies a process using limit gauges, for the validation of taper internal and external threads and parallel internal threads on piping systems components and other products, the dimensions and tolerances of which are detailed in EN 10226-1 and prEN 10226-2.

The gauging system described may not be suitable, without special precautions, for gauging of threads on injection moulded plastic workpieces.

This document does not cover completely all the requirements necessary for full control of thread quality and dimensions. Additional control of tools and equipment and visual inspection during production are required to ensure complete compliance with EN 10226-1 and prEN 10226-2, for example the length of useful thread on internally threaded workpieces should be checked by direct measurement.

Annex A gives a summary of the gauges included in this document, together with details of the thread elements controlled by each gauge and gauge identification numbers.

In the event of a dispute over compliance with the requirements of EN 10226-1 and prEN 10226-2, the gauges in this document are to be considered as decisive for the thread elements which they control on the workpiece.

2 Normative reference

The following referenced documents are indispensable for the application 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 10226-1:2004, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Taper external threads and parallel internal threads — Dimensions, tolerances and designation.*

prEN 10226-2:2002, *Pipe threads where pressure-tight joints are made on the threads — Part 2: Taper external threads and taper internal threads — Dimensions, tolerances and designation.*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 10226-1:2004 and prEN 10226-2:2002 and the following apply.

accommodation length
distance from the face of an internally threaded workpiece to the first obstruction which the externally threaded workpiece will encounter on assembly.

See Figure 3

4 Symbols

The symbols used and their explanations are given in Table 1.

Table 1 — Symbols

Symbol	Explanation
b_1	Width of clearance groove at major diameter of parallel full form threaded ring gauges and minor diameter of taper full form threaded plug gauges
b_2	Width of clearance groove at major diameter of parallel modified thread form check ring gauges and at minor diameter of taper modified thread form check plug gauges
c	Height of tolerance step on plug gauges
D	Major diameter of internal thread at gauge plane
D_1	Minor diameter of internal thread at gauge plane
D_2	Pitch diameter of internal thread at gauge plane
D_4	Counterbore diameter of parallel full form threaded ring gauge and taper plain ring gauge
d	Major diameter of external thread at gauge plane
d_1	Minor diameter of external thread at gauge plane
d_2	Pitch diameter of external thread at gauge plane
F	Radial distance from the pitch diameter to the truncated crest, along the centreline of the thread profile
l_0	Overall length of taper full form threaded plug gauge and taper modified thread form check plug gauge
l_1	Length from end face to the gauge plane on taper full form threaded plug gauge
l_2	Length of tolerance step on plug gauges
l_3	Overall length of parallel full form threaded ring gauge, parallel modified thread form check ring gauge and length from gauge plane to small end of taper plain ring gauge
l_4	Length of tolerance step on ring gauges
l_5	Depth of counterbore on parallel full form threaded ring gauge
l_6	Overall length of taper full form threaded plug gauge with relief
l_7	Width of relief on taper full form threaded plug gauge with relief
l_8	Length from relief on taper full form threaded plug gauge with relief to large end of gauge
l_9	Overall length of taper plain ring gauge
l_{10}	Depth of counterbore on taper plain ring gauge
l_{11}	Distance from step on gauge Nos. 1 and 2 to face of gauge No. 6 when verifying pitch diameter of new gauge Nos. 1 and 2
l_{12}	Distance from step on gauge No. 5 to face of gauge No. 6 when verifying pitch diameter of new gauge No. 6
l_{13}	Distance from step on gauge Nos. 1 and 2 to face of gauge No. 6 when checking pitch diameter of gauge Nos. 1 and 2 for wear

Table 1 (*concluded*)

Symbol	Explanation
l_{14}	Distance from step on gauge No. 5 to face of gauge No. 3 when checking pitch diameter of gauge No. 3 for wear
P	Pitch
$T_{\alpha 1}/2$	Tolerance on flank angle of full form threads
$T_{\alpha 2}/2$	Tolerance on flank angle of modified form threads
T_{CP}	Tolerance on pitch diameter for taper modified thread form check plug gauge and parallel modified thread form check ring gauge
T_P	Tolerance on pitch
T_{PL}	Tolerance on pitch diameter and wear allowance for taper full form threaded plug gauges
T_R	Tolerance on pitch diameter and wear allowance for parallel full form threaded ring gauge and tolerance on diameter and wear allowance for taper plain ring gauge
T_1	Tolerance on the gauge length of an external thread
T_2	Tolerance on position of gauge plane on an internal thread
W	Permissible wear on diameter of all gauges except taper modified thread form check plug gauges
NOTE The values of D, D_1, D_2, d, d_1 and d_2 shown in Table 2 to Table 7 are basic values and are subject to the manufacturing tolerances specified in Clause 7.	

5 Design of gauges

5.1 General

The taper full form threaded plug gauges and parallel full form threaded ring gauges (see 5.2 and 5.3) together with the taper plain ring gauges (see 5.4) have been chosen as representing the requirements for mating components or products within the tolerances of EN 10226-1 and prEN 10226-2.

Because of the 1:16 taper of the gauge and/or the threaded workpiece, it is possible to represent the maximum and minimum limits of diameter by means of tolerance steps within the axial length of the gauges.

The plain ring gauges included in this document, allow a combined check of the major diameter and the length of useful thread of externally threaded workpieces.

The taper modified thread form check plug gauge (see 5.5) and parallel modified thread form check ring gauge (see 5.6) for checking the manufacturing tolerances and wear allowances for the parallel full form threaded ring gauges and taper full form threaded plug gauges respectively, are made to a modified thread form.

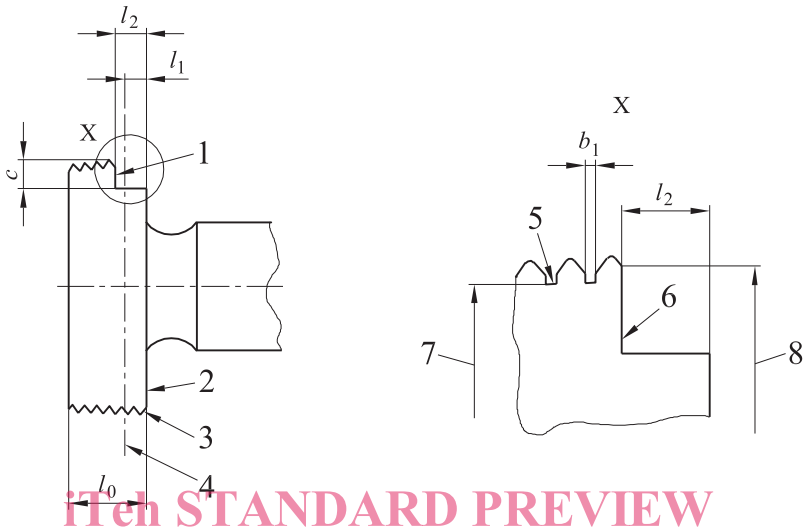
Some dimensions given in this document are more precise than the equivalent dimensions given in EN 10226-1 and prEN 10226-2. This greater precision is only intended to assist the gauge manufacturing process and is of no practical significance when using the gauges.

NOTE The expression "full form" has been used to describe those threaded plug and ring gauges which may be full form or alternatively have thread form relief at the discretion of the manufacturer, so as to differentiate from those threaded check plug and check ring gauges which are always of modified thread form.

5.2 Taper full form threaded plug gauges (gauges No. 1 and No. 2)

5.2.1 Taper full form threaded plug gauge (gauge No. 1)

This gauge is a 1:16 taper full form threaded plug gauge (see Figure 1) and is suitable for checking the major diameter (D) and pitch diameter (D_2) at the gauge plane of internal parallel (Rp) threads and internal taper (Rc) threads.



Key

1 Face marked
2 Face marked
3 Incomplete thread at each end of gauge shall be removed or chamfered (see 7.1.1.1)
4 Gauge plane
5 Optional clearance groove (see 7.1.1.1)
6 The middle of the step face shall cut the thread flank at the pitch diameter
7 Clearance diameter
8 Pitch diameter

Figure 1 — Taper full form threaded plug gauge (gauge No. 1)

The dimensions of this gauge are given in Table 2 and manufacturing tolerances are given in 7.1.1.2.

The gauge incorporates a step equal in length to the total tolerance T_2 on the position of the gauge plane of the internal thread specified in EN 10226-1 and prEN 10226-2. To allow for the chamfer on the internal thread, the step is displaced by 0,5P relative to the gauge plane, such that the internally threaded workpiece can be verified with reference to its face.

The large diameter end face of the gauge is marked '+' (positive) and the face of the tolerance step is marked '–' (negative).

NOTE For sizes smaller than 1/2, the '+' and '–' markings may be omitted if not practicable.

Table 2 — Dimensions of taper full form threaded plug gauge (gauge No. 1)

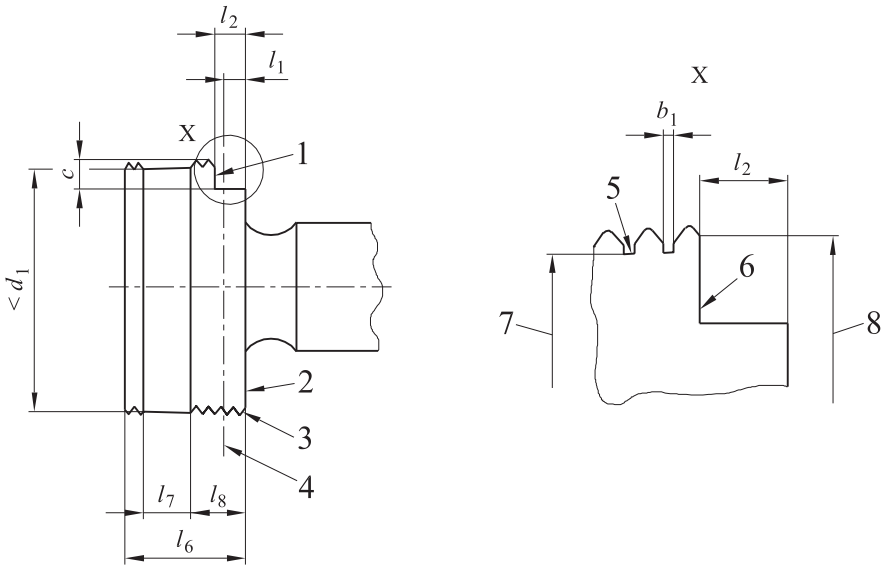
Dimensions in millimetres

Designation of thread	Pitch P	Diameters at gauge plane Major d, D	 Pitch d_2, D_2	 Minor d_1, D_1	Overall length of gauge l_0	Length from end face to the gauge plane l_1	Length of tolerance step l_2	Width of clearance groove b_1 max.	Height of step c
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1/16	0,907	7,723	7,142	6,561	5,6	1,588	2,268	0,3	1,8
1/8	0,907	9,728	9,147	8,566	5,6	1,588	2,268	0,3	1,8
1/4	1,337	13,157	12,301	11,445	8,4	2,339	3,342	0,4	2,4
3/8	1,337	16,662	15,806	14,950	8,8	2,339	3,342	0,4	2,4
1/2	1,814	20,955	19,793	18,631	11,4	3,175	4,536	0,5	3,3
3/4	1,814	26,441	25,279	24,117	12,7	3,175	4,536	0,5	4,5
1	2,309	33,249	31,770	30,291	14,5	4,041	5,773	0,6	5,8
1 1/4	2,309	41,910	40,431	38,952	14,5	4,041	5,773	0,6	5,8
1 1/2	2,309	47,803	46,324	44,845	14,5	4,041	5,773	0,6	5,8
2	2,309	59,614	58,135	56,656	15	4,041	5,773	0,6	5,8
2 1/2	2,309	75,184	73,705	72,226	17,5	4,618	6,927	0,6	6,9
3	2,309	87,884	86,405	84,926	18,5	4,618	6,927	0,6	6,9
4	2,309	113,030	111,551	110,072	20	4,618	6,927	0,6	6,9
5	2,309	138,430	136,951	135,472	24	4,618	6,927	0,6	10
6	2,309	163,830	162,351	160,872	24	4,618	6,927	0,6	10

NOTE The values given in columns 3, 4 and 5 are basic values intended for the calculation of diameters at the gauge plane in accordance with 7.1.1.

5.2.2 Taper full form threaded plug gauge with relief (gauge No. 2)

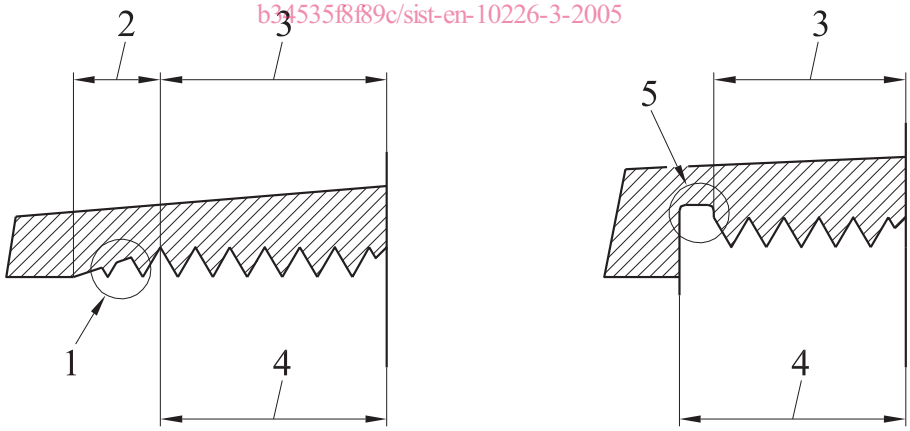
This gauge is a 1:16 taper full form threaded plug gauge with relief of threads (see Figure 2) and is suitable for checking the major diameter (D) and pitch diameter (D_2) at the gauge plane, and the accommodation length (see Figure 3) of internal parallel (Rp) threads and internal taper (Rc) threads.



Key

1 Face marked
2 Face marked
3 Incomplete thread at each end of gauge shall be removed or chamfered (see 7.1.1.1)
4 Gauge plane
5 Optional clearance groove (see 7.1.1.1)
6 The middle of the step face shall cut the thread flank at the pitch diameter
7 Clearance diameter
8 Pitch diameter

Figure 2 — Taper full form threaded plug gauge with relief (gauge No. 2)



Key

1 Without free run-out
2 Washout thread
3 Complete thread
4 Accommodation length
5 With free run-out

NOTE Figure 3 is applicable to internal parallel (Rp) threads and internal taper (Rc) threads.

Figure 3 — Accommodation length

The dimensions of this gauge are given in Table 3 and manufacturing tolerances are given in 7.1.1.2.

The gauge incorporates a step equal in length to the total tolerance T_2 on the position of the gauge plane of the internal thread specified in EN 10226-1 and prEN 10226-2. To allow for the chamfer on the internal thread, the step is displaced by 0,5P relative to the gauge plane, such that the internally threaded workpiece can be checked with reference to its face. On sizes 1/4 and larger, a thread relief is provided part way along the gauge, thereby reducing the number of threads and consequential friction in contact with the internally threaded workpiece.

The overall length (l_6) of the gauge is equal to the length of useful thread for maximum gauge length plus 0,5P.

The large diameter end face of the gauge is marked '+' (positive) and the face of the tolerance step is marked '–' (negative).

NOTE For sizes smaller than 1/2, the '+' and '–' markings may be omitted if not practicable.

Table 3 — Dimensions of taper full form threaded plug gauge with relief (gauge No. 2)

Dimensions in millimetres

Desig-nation of thread	Pitch	Diameters at gauge plane			Length from end face to the gauge plane	Length of tolerance step	Overall Length of gauge	Width of relief	Length from relief to large end of gauge	Width of clearance groove	Height of step
		Major	Pitch	Minor							
	P	d, D	d_2, D_2	d_1, D_1	l_1	l_2	l_6	l_7	l_8	b_1 max.	c
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1/16	0,907	7,723	7,142	6,561	1,588	2,268	7,823	—	—	0,3	1,8
1/8	0,907	9,728	9,147	8,566	1,588	2,268	7,823	—	—	0,3	1,8
1/4	1,337	13,157	12,301	11,445	2,339	3,342	11,699	2,3	5,3	0,4	2,4
3/8	1,337	16,662	15,806	14,950	2,339	3,342	12,033	2,7	5,3	0,4	2,4
1/2	1,814	20,955	19,793	18,631	3,175	4,536	15,872	3,2	7,3	0,5	3,3
3/4	1,814	26,441	25,279	24,117	3,175	4,536	17,233	4,5	7,3	0,5	4,5
1	2,309	33,249	31,770	30,291	4,041	5,773	20,204	4,1	9,2	0,6	5,8
1 1/4	2,309	41,910	40,431	38,952	4,041	5,773	22,513	6,4	9,2	0,6	5,8
1 1/2	2,309	47,803	46,324	44,845	4,041	5,773	22,513	6,4	9,2	0,6	5,8
2	2,309	59,614	58,135	56,656	4,041	5,773	26,842	10,7	9,2	0,6	5,8
2 1/2	2,309	75,184	73,705	72,226	4,618	6,927	31,316	14	10,4	0,6	6,9
3	2,309	87,884	86,405	84,926	4,618	6,927	34,491	17,1	10,4	0,6	6,9
4	2,309	113,030	111,551	110,072	4,618	6,927	40,407	23,1	10,4	0,6	6,9
5	2,309	138,430	136,951	135,472	4,618	6,927	44,737	27,4	10,4	0,6	10
6	2,309	163,830	162,351	160,872	4,618	6,927	44,737	27,4	10,4	0,6	10

NOTE The values given in columns 3, 4 and 5 are basic values intended for the calculation of diameters at the gauge plane in accordance with 7.1.1.