



**International  
Standard**

**ISO 8746**

**Fasteners — Grooved pins with round  
head — Full-length diamond grooves**

*Fixations — Clous cannelés à tête ronde — Cannelures diamant  
sur toute la longueur*

**Third edition  
2025-02**

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). ISO shall not be held responsible for identifying any or all such patent rights.

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 2, *Fasteners*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 185 *Fasteners*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 8746:1997) which has been technically revised.

The main changes are as follows:

- terms and definitions, principles for grooved pins and assembly (including hole dimensions), control of the expanded diameter  $d_2$  and pin straightness, mechanical and physical properties (including shear resistance and hardness) and inspection which are common for all grooved pins (product standards ISO 8739 to ISO 8747, ISO 13670 and ISO 13672) have been specified in the new reference standard ISO 13669 dealing with general requirements;
- nominal sizes 1,4 mm and 1,6 mm have been deleted;
- the symbols for the pilot point (PL instead of B) and optional chamfer point (CH instead of A) have been amended analogously to ISO 4753; the length of the points has been specified as a minimum value;
- the head diameters  $d_k$  have been recalculated and rounded to the nearest 0,05 mm for pins with nominal sizes up to 8 mm;  $d_{k,max}$  has been recalculated for pins with nominal sizes 16 mm and 20 mm;
- the maximum distance between the underhead bearing surface and the beginning of the grooves  $l_k$  has been added;
- stainless steel grades A2, A4, C1 and F1 have been added;
- other materials (such as hardened steels, brass, aluminium) are by agreement (see [Table 3](#));
- specifications for labelling have been added as [Clause 8](#).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

# Fasteners — Grooved pins with round head — Full-length diamond grooves

## 1 Scope

This document specifies the characteristics of grooved pins with round head, full-length diamond grooves and pilot point or chamfered point, in steel and stainless steel, and with nominal diameter 2 mm to 20 mm.

These grooved pins are designed to fulfil the main following function: locking together two or more parts, with the easiest installation (due to the pilot or chamfer point) and a highest level of pull-out resistance (due to the elastic fit behaviour of the pin).

The general requirements (including functional principles for grooved pins and assembly) are specified in ISO 13669.

## 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.

ISO 1891-4, *Fasteners — Vocabulary — Part 4: Control, inspection, delivery, acceptance and quality*

ISO 3269, *Fasteners — Acceptance inspection*

ISO 3506-6, *Fasteners — Mechanical properties of corrosion-resistant stainless steel fasteners — Part 6: General rules for the selection of stainless steels and nickel alloys for fasteners*

ISO 4042, *Fasteners — Electroplated coating systems*

ISO 9717, *Metallic and other inorganic coatings — Phosphate conversion coating of metals*

ISO 10683, *Fasteners — Non-electrolytically applied zinc flake coating systems*

ISO 13669, *Fasteners — Grooved pins — General requirements*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13669 apply.

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

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

## 4 Principles of grooved pins and assembly

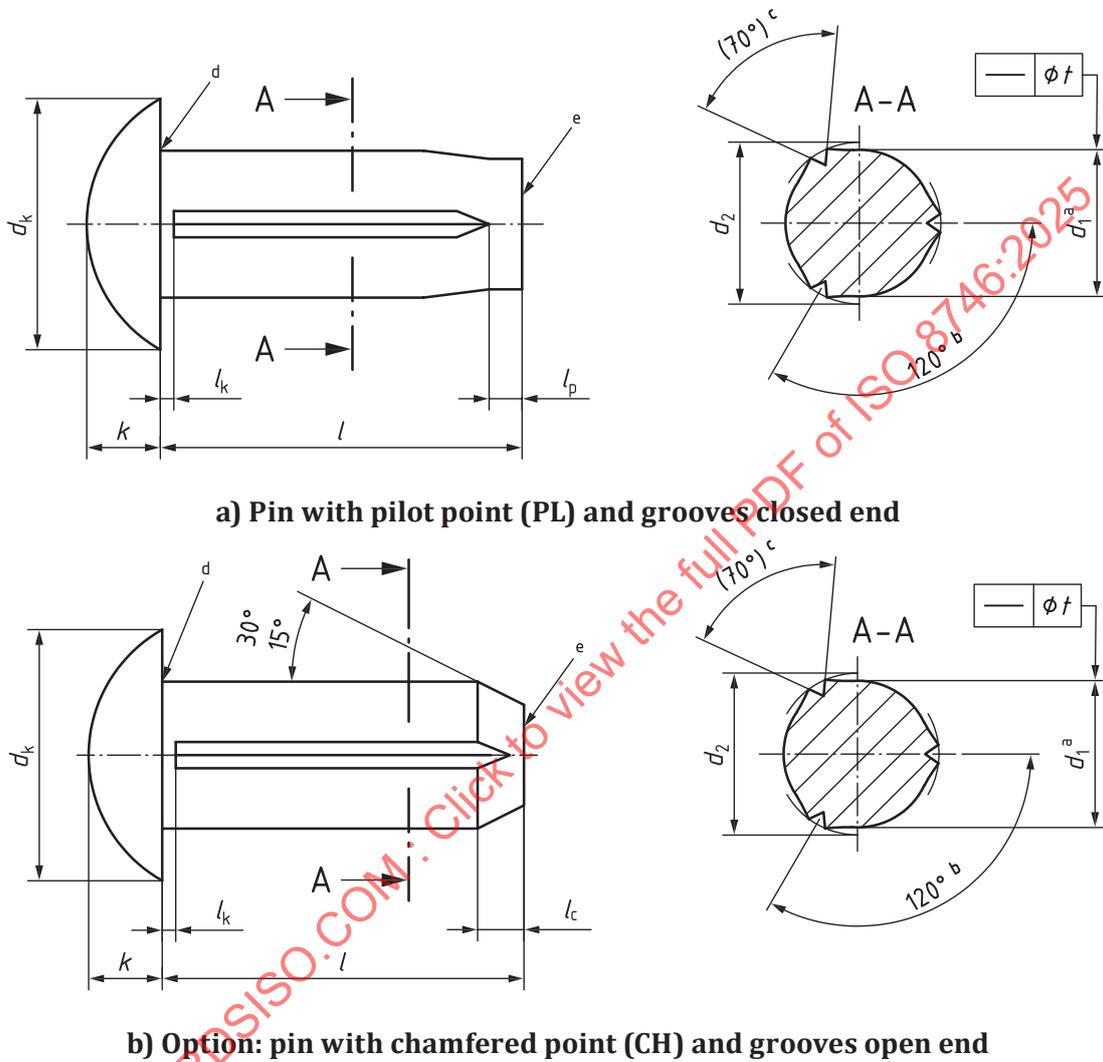
The principles of grooved pins and assembly specified in ISO 13669 shall apply.

## 5 Dimensions

Dimensions shall be in accordance with [Figure 1](#) and with [Tables 1](#) and [2](#). The control of the expanded diameter  $d_2$  and pin straightness  $t$  shall be as specified in ISO 13669.

For coated pins, dimensions and tolerances shall apply prior to coating.

Unless otherwise agreed at the time of the order, the pins are manufactured with a pilot point.



- a The pin diameter  $d_1$  is only applicable in areas where grooves are not present.
- b The angle of  $120^\circ$  between two grooves shall apply with a tolerance of  $\pm 20^\circ$ .
- c The groove angle of  $70^\circ$  is a reference dimension, see ISO 13669.
- d No sharp underhead transition.
- e The surface of the end results from cutting process and remains “as cut”.

**Figure 1 — Grooved pins with round head**

The three grooves shall be closed at the pilot point.

The three grooves shall be open at the chamfered point.

Table 1 — Dimensions for sizes 2 mm to 8 mm

Dimensions in millimetres

Nominal diameter, $d$		2	2,5	3	4	5	6	8	
$d_1$	max.	2,000	2,500	3,000	4,00	5,00	6,00	8,00	
	min.	1,950	2,425	2,925	3,90	4,90	5,90	7,85	
$d_k^a$	max.	3,70	4,60	5,50	7,25	9,05	10,80	14,4	
	min.	3,30	4,20	5,00	6,75	8,45	10,20	13,6	
$k$	max.	1,30	1,60	1,95	2,55	3,15	3,75	5,0	
	min.	1,10	1,40	1,65	2,25	2,85	3,45	4,6	
$l_c^{b,c}$	min.	0,6	0,75	0,9	1,2	1,5	1,8	2,4	
$l_p^c$	min.	0,6	0,75	0,9	1,2	1,5	1,8	2,4	
$l_k$	max.	1,5	1,5	1,5	1,5	1,5	1,5	2,0	
$r$	$\approx$	1,9	2,4	2,8	3,8	4,6	5,6	7,5	
Length, $l$		Expanded diameter, $d_2^d$							$l$ nom.
nom.	tol.	+0,05 0	$\pm 0,05$						
3	$\pm 0,20$								3
4	$\pm 0,30$	2,15 [2,10]	2,70 [2,65]	3,20 [3,15]	4,25 [4,20]	5,25 [5,20]	6,30 [6,225]	8,30 [8,225]	4
5									5
6									6
8									8
10	$\pm 0,40$								10
12									12
16									16
20									20
25	$\pm 0,50$								25
30									30
35									35
40									40

The range of standard lengths are specified between the stepped bold lines (white area).

<sup>a</sup>  $d_{k,nom} = 1,75 d$  (rounded to the nearest 0,05 mm) up to  $d = 8$  mm.

<sup>b</sup> Chamfer point only upon specific request at the time of the order.

<sup>c</sup>  $l_c = l_p$ , both equal to  $0,3 d$ .

<sup>d</sup> Within a length range, the first value for  $d_2$  is specified for steel pins and the second value in square brackets for stainless steel pins.

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Table 2 — Dimensions for sizes 10 mm to 20 mm

Dimensions in millimetres

Nominal diameter, $d$		10	12	16	20
$d_1$	max.	10,00	12,00	16,00	20,00
	min.	9,85	11,80	15,80	19,80
$d_k$	max.	16,0	19,0	26,1	33,1
	min.	14,9	17,7	23,7	30,7
$k$	max.	7,4	8,4	10,9	13,9
	min.	6,5	7,5	10,0	13,0
$l_c^{a,b}$	min.	3,0	3,6	4,8	6,0
$l_p^b$	min.	3,0	3,6	4,8	6,0
$l_k$	max.	2,0	2,0	3,0	3,0
$r$	$\approx$	8,0	9,5	13,0	16,5

Length, $l$		Expanded diameter, $d_2^c$			$l$	
nom.	tol.	$\pm 0,05$	$\pm 0,10$		nom.	
12	$\pm 0,40$	10,35 [10,25]			12	
16					16	
20					20	
25			12,35 [12,275]	16,40 [16,30]	20,50 [20,375]	25
30						30
35						35
40						40

The range of standard lengths are specified between the stepped bold lines (white area).

<sup>a</sup> Chamfer point only upon specific request at the time of the order.

<sup>b</sup>  $l_c = l_p$ , both equal to  $0,3d$ .

<sup>c</sup> Within a length range, the first value for  $d_2$  is specified for steel pins and the second value in square brackets for stainless steel pins.

## 6 Requirements and reference International Standards

The requirements specified in the International Standards referenced in [Table 3](#) shall apply.

**Table 3 — Requirements and reference International Standards**

Material <sup>a</sup>		Steel	Stainless steel
<b>General requirements</b>	International Standard	ISO 13669	
<b>Material</b>	Steel symbol	St	—
	Stainless steel grade <sup>b</sup>	—	A1 A2 A4 C1 F1
	International Standard	At the discretion of the manufacturer, providing that the mechanical and physical properties are met ISO 3506-6	
<b>Mechanical properties</b>		ISO 13669	
<b>Surface condition</b>	As processed (no coating) Electroplated coatings as specified in ISO 4042 Non-electrolytically applied zinc flake coatings as specified in ISO 10683 Phosphate coatings as specified in ISO 9717		Clean and bright  and/or  Passivated <sup>c</sup>
	Other finishes, coatings and/or additional requirements shall be agreed between the purchaser and the supplier		
<b>Workmanship</b>		Pins shall be free of burrs and detrimental defects	
<b>Acceptability</b>		Acceptance inspection as specified in ISO 3269	
<sup>a</sup> For a particular application, these pins may be manufactured from materials other than steel and stainless steel (such as quenched and tempered, case-hardened or carbo-nitrided steels, brass, aluminium, etc.); in this case, material and related mechanical properties shall be agreed between the purchaser and the manufacturer before the order (see ISO 13669), as well as at least values for expanded diameter, $d_2$ .			
<sup>b</sup> If other stainless steel grades are needed, they can be selected in ISO 3506-6.			
<sup>c</sup> See e.g. ISO 16048.			

## 7 Labelling on package

Labelling on the package for pins shall include at least:

- the reference to this document, i.e. ISO 8746;
- the nominal diameter  $d$  and nominal length  $l$ ;
- option as relevant: CH for pins with chamfer point;
- the symbol St for steel pins, or the grade for stainless steel pins;
- the type of surface condition (finish and/or coating);
- the manufacturer's and/or distributor's identification and/or name;
- the manufacturing lot number as specified in ISO 1891-4;
- the quantity of pieces in the package.