

BS EN ISO 7045:2011



BSI Standards Publication

# Pan head screws with type H or type Z cross recess — Product grade A (ISO 7045:2011)

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**National foreword**

This British Standard is the UK implementation of EN ISO 7045:2011. It supersedes BS EN ISO 7045:1995 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee FME/9/3, Fasteners - Product Standards.

A list of organizations represented on this committee can be obtained on request to its secretary.

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**Amendments issued since publication**

Date	Text affected
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English Version

## Pan head screws with type H or type Z cross recess - Product grade A (ISO 7045:2011)

Vis à métaux à tête cylindrique bombée large à empreinte cruciforme de type H ou de type Z - Grade A (ISO 7045:2011)

Flachkopfschrauben mit Kreuzschlitz Form H oder Form Z - Produktklasse A (ISO 7045:2011)

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## Foreword

This document (EN ISO 7045:2011) has been prepared by Technical Committee ISO/TC 2 "Fasteners" in collaboration with Technical Committee CEN/TC 185 "Fasteners" the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by March 2012, and conflicting national standards shall be withdrawn at the latest by March 2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 7045:1994.

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## Foreword

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ISO 7045 was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 11, *Fasteners with metric external thread*.

This third edition cancels and replaces the second edition (ISO 7045:1994), of which it constitutes a minor revision.



# Pan head screws with type H or type Z cross recess — Product grade A

## 1 Scope

This International Standard specifies the characteristics of pan head screws of product grade A, with threads from M1,6 to M10 inclusive, and with type H or type Z cross recess.

If, in special cases, specifications other than those listed in this International Standard are required, they can be selected from existing International Standards, for example ISO 261, ISO 888, ISO 898-1, ISO 965-2 and ISO 3506-1.

## 2 Normative references

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.

ISO 225, *Fasteners — Bolts, screws, studs and nuts — Symbols and descriptions of dimensions*

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

ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread*

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 3269, *Fasteners — Acceptance inspection*

ISO 3506-1, *Mechanical properties of corrosion-resistant stainless steel fasteners — Part 1: Bolts, screws and studs*

ISO 4042, *Fasteners — Electroplated coatings*

ISO 4757, *Cross recesses for screws*

ISO 4759-1, *Tolerances for fasteners — Part 1: Bolts, screws, studs and nuts — Product grades A, B and C*

ISO 6157-1, *Fasteners — Surface discontinuities — Part 1: Bolts, screws and studs for general requirements*

ISO 8839, *Mechanical properties of fasteners — Bolts, screws, studs and nuts made of non-ferrous metals*

ISO 8992, *Fasteners — General requirements for bolts, screws, studs and nuts*

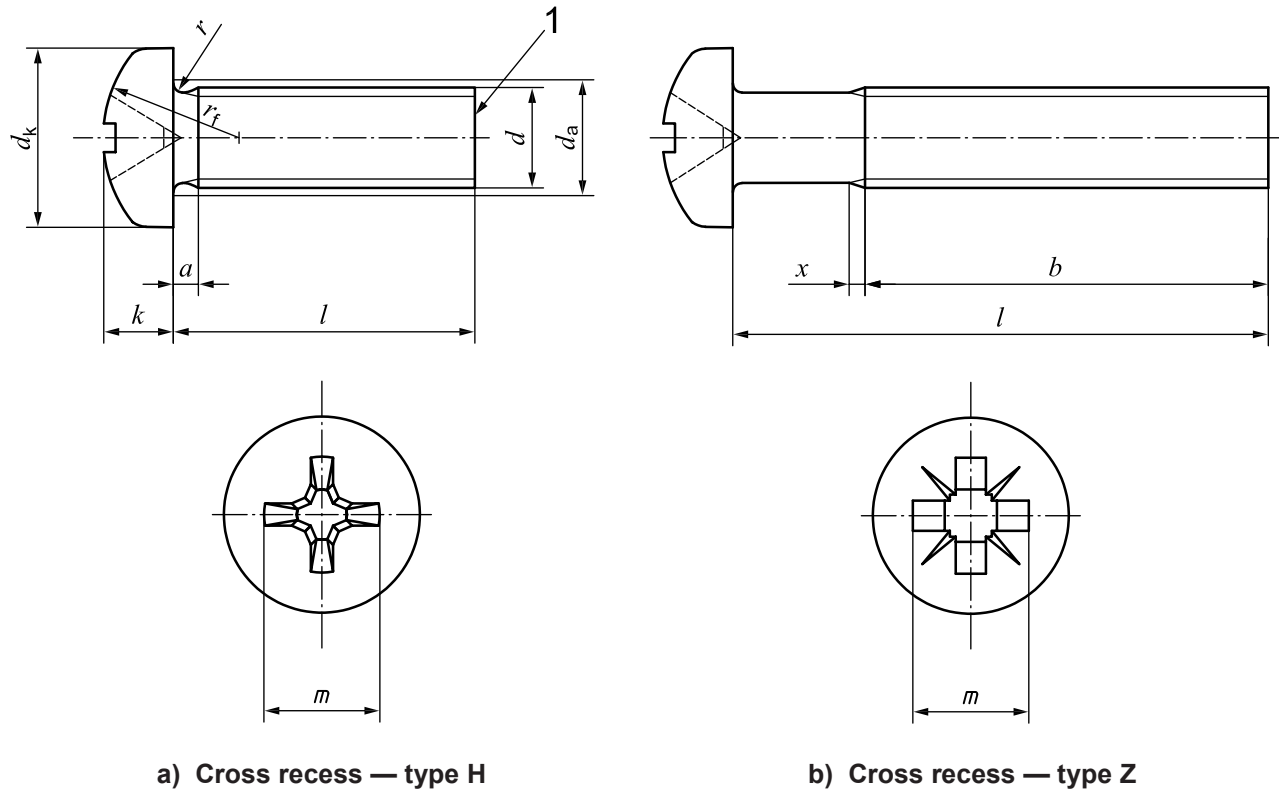
ISO 10683, *Fasteners — Non-electrolytically applied zinc flake coatings*

ISO 16048, *Passivation of corrosion-resistant stainless-steel fasteners*

### 3 Dimensions

See Figure 1 and Table 1. Symbols and descriptions of dimensions are specified in ISO 225.

The shank diameter is approximately equal to the pitch diameter or equal to the permissible major thread diameter.



**Key**

1 as-rolled end

**Figure 1**



Table 1 — Dimensions

Dimensions in millimetres

Thread, <i>d</i>		M1,6	M2	M2,5	M3	(M3,5) <sup>a</sup>	M4	M5	M6	M8	M10		
<i>p</i> <sup>b</sup>		0,35	0,4	0,45	0,5	0,6	0,7	0,8	1	1,25	1,5		
<i>a</i>	max.	0,7	0,8	0,9	1	1,2	1,4	1,6	2	2,5	3		
<i>b</i>	min.	25	25	25	25	38	38	38	38	38	38		
<i>d</i> <sub>a</sub>	max.	2	2,6	3,1	3,6	4,1	4,7	5,7	6,8	9,2	11,2		
<i>d</i> <sub>k</sub>	nom. = max.	3,2	4,0	5,0	5,6	7,00	8,00	9,50	12,00	16,00	20,00		
	min.	2,9	3,7	4,7	5,3	6,64	7,64	9,14	11,57	15,57	19,48		
<i>k</i>	nom. = max.	1,30	1,60	2,10	2,40	2,60	3,10	3,70	4,6	6,0	7,50		
	min.	1,16	1,46	1,96	2,26	2,46	2,92	3,52	4,3	5,7	7,14		
<i>r</i>	min.	0,1	0,1	0,1	0,1	0,1	0,2	0,2	0,25	0,4	0,4		
<i>r</i> <sub>f</sub>	≈	2,5	3,2	4	5	6	6,5	8	10	13	16		
<i>x</i>	max.	0,9	1	1,1	1,25	1,5	1,75	2	2,5	3,2	3,8		
Cross recess	Recess	no.	0		1		2		3	4			
		<i>m</i>	ref.	1,7	1,9	2,7	3	3,9	4,4	4,9	6,9	9	10,1
	Type H Penetration		max.	0,95	1,2	1,55	1,8	1,9	2,4	2,9	3,6	4,6	5,8
			min.	0,70	0,9	1,15	1,4	1,4	1,9	2,4	3,1	4,0	5,2
	Type Z Penetration		ref.	1,6	2,1	2,6	2,8	3,9	4,3	4,7	6,7	8,8	9,9
			max.	0,90	1,42	1,50	1,75	1,93	2,34	2,74	3,46	4,50	5,69
			min.	0,65	1,17	1,25	1,50	1,48	1,89	2,29	3,03	4,05	5,24
	<i>l</i> <sup>ac</sup>			Approximate mass, in kilograms per 1 000 pieces ( $\rho = 7,85 \text{ kg/dm}^3$ ) (for information only)									
nom.	min.	max.											
3	2,8	3,2	0,099	0,178	0,336								
4	3,76	4,24	0,111	0,196	0,366	0,544							
5	4,76	5,24	0,123	0,215	0,396	0,588	0,891	1,3					
6	5,76	6,24	0,134	0,223	0,462	0,632	0,951	1,38	2,32				
8	7,71	8,29	0,157	0,27	0,486	0,72	1,07	1,53	2,57	4,37			
10	9,71	10,29	0,18	0,307	0,546	0,808	1,19	1,69	2,81	4,72	9,96		
12	11,65	12,35	0,203	0,344	0,606	0,896	1,31	1,84	3,06	5,07	10,6	19,8	
(14)	13,65	14,35	0,226	0,381	0,666	0,984	1,43	2	3,31	5,42	11,2	20,8	
16	15,65	16,35	0,245	0,418	0,726	1,07	1,55	2,15	3,56	5,78	11,9	21,8	
20	19,58	20,42		0,492	0,846	1,25	1,79	2,46	4,05	6,48	13,2	23,8	
25	24,58	25,42			0,996	1,47	2,09	2,85	4,67	7,36	14,8	26,3	
30	29,58	30,42				1,69	2,39	3,23	5,29	8,24	16,4	28,8	
35	34,5	35,5					2,68	3,62	5,91	9,12	18	31,3	
40	39,5	40,5						4,01	6,52	10	19,6	33,9	
45	44,5	45,5							7,14	10,9	21,2	36,4	

Table 1 (continued)

Dimensions in millimetres

Thread, <i>d</i>			M1,6	M2	M2,5	M3	(M3,5) <sup>a</sup>	M4	M5	M6	M8	M10
<i>l<sup>ac</sup></i>			Approximate mass, in kilograms per 1 000 pieces ( $\rho = 7,85 \text{ kg/dm}^3$ ) (for information only)									
nom.	min.	max.										
<b>50</b>	49,5	50,5								11,8	22,8	38,9
<b>(55)</b>	54,05	55,95								12,6	24,4	41,4
<b>60</b>	59,05	60,95								13,5	26	43,9
NOTE Preferred lengths are those between the solid, bold, stepped lines.												
<sup>a</sup> Sizes in parentheses should be avoided if possible.												
<sup>b</sup> <i>P</i> is the pitch of the thread.												
<sup>c</sup> Screws with nominal lengths above the bold, discontinuous line are threaded up to the head; $b = l - a$ .												

#### 4 Specifications and reference International Standards

See Table 2.

Table 2 — Specifications and reference International Standards

Material	Steel	Stainless steel	Non-ferrous metal
<b>General requirements</b>	International Standard	ISO 8992	
<b>Thread</b>	Tolerance class	6g	
	International Standard	ISO 261, ISO 965-2	
<b>Mechanical property</b>	Property class	4.8	A2-50, A2-70
	International Standard	ISO 898-1	ISO 3506-1
<b>Tolerance</b>	Product grade	A	
	International Standard	ISO 4759-1	
<b>Cross recess</b>	International Standard	ISO 4757	
<b>Finish — Coating</b>	As processed		
	Requirements for electroplating are specified in ISO 4042.	Requirements for passivation are specified in ISO 16048.	Requirements for electroplating are specified in ISO 4042.
	Requirements for non-electrolytically applied zinc flake coatings are specified in ISO 10683.	Additional requirements or other finishes or coatings shall be agreed between the supplier and the purchaser.	
<b>Surface integrity</b>	Limits for surface discontinuities are specified in ISO 6157-1.		
<b>Acceptability</b>	Acceptance inspection is specified in ISO 3269.		

## 5 Designation

EXAMPLE A cross-recessed pan head screw with thread M5, nominal length  $l = 20$  mm, property class 4.8 and cross recess type Z is designated as follows:

**Pan head screw ISO 7045 - M5 × 20 - 4.8 - Z**

## Bibliography

- [1] ISO 888, *Bolts, screws and studs — Nominal lengths, and thread lengths for general purpose bolts*







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