
**Cross-recessed raised countersunk
(oval) head tapping screws**

Vis à tôle à tête fraisée bombée à empreinte cruciforme

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 7051 was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 13, *Fasteners with non-metric thread*.

This second edition cancels and replaces the first edition (ISO 7051:1983), which has been technically revised.

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Cross-recessed raised countersunk (oval) head tapping screws

1 Scope

This International Standard specifies the characteristics of cross-recessed raised countersunk (oval) head tapping screws with thread sizes from ST 2,2 to ST 9,5 inclusive.

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 1478, *Tapping screws thread*

ISO 2702, *Heat-treated steel tapping screws — Mechanical properties*

ISO 3269, *Fasteners — Acceptance inspection*

ISO 3506-4, *Mechanical properties of corrosion-resistant stainless steel fasteners — Part 4: Tapping screws*

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 7721, *Countersunk head screws — Head configuration and gauging*

ISO 7721-2, *Countersunk flat head screws — Part 2: Penetration depth of cross recesses*

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

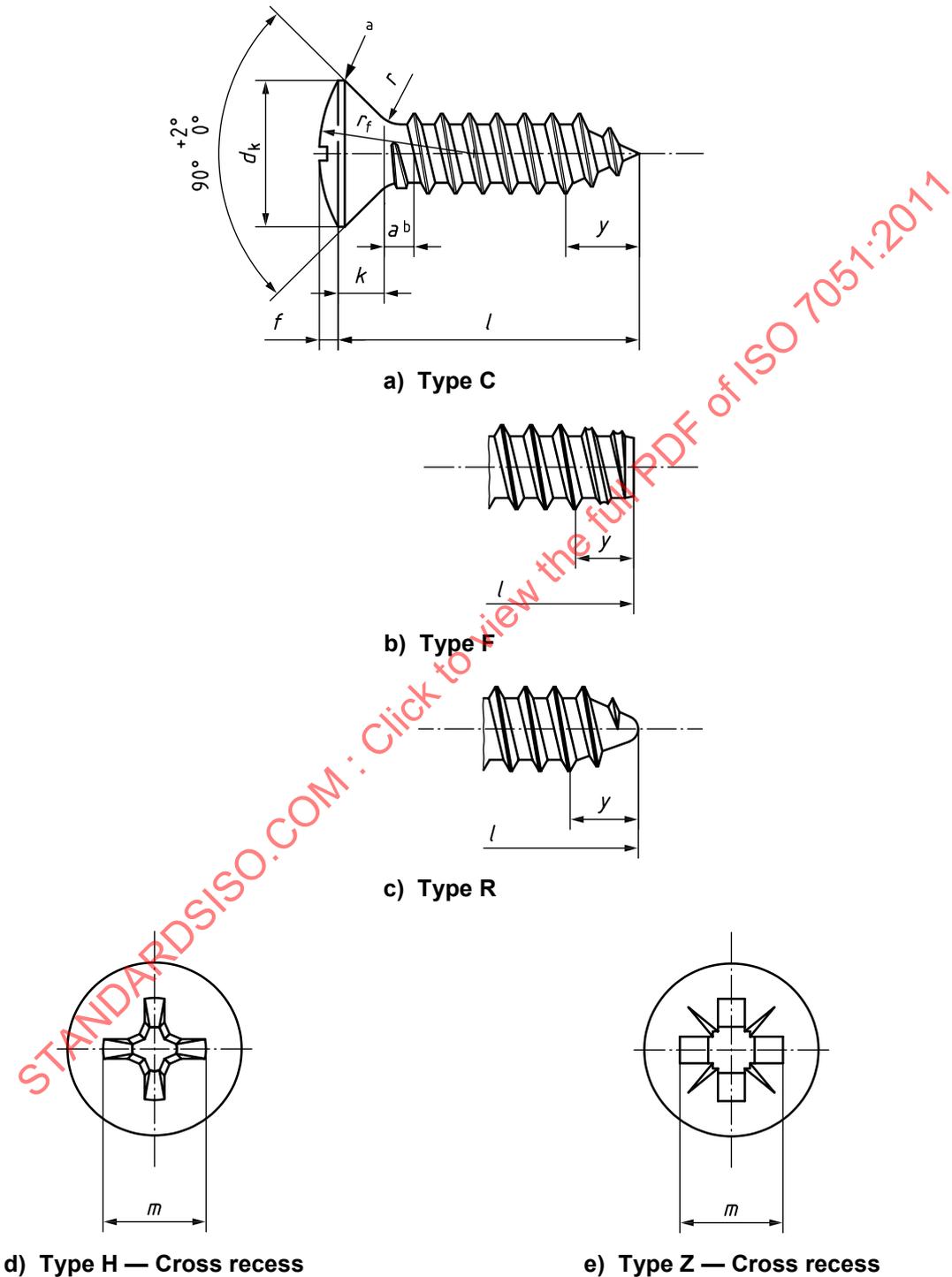
ISO 10683, *Fasteners — Non-electrolytically applied zinc flake coatings*

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.



a Edge rounded or flat.

b Dimension a shall be measured at the core diameter of the first full thread.

Figure 1 — Cross-recessed raised countersunk (oval) head tapping screws

Table 1 — Dimensions

Dimensions in millimetres

Thread size		ST 2,2	ST 2,9	ST 3,5	ST 4,2	ST 4,8	ST 5,5	ST 6,3	ST 8	ST 9,5		
p^a		0,8	1,1	1,3	1,4	1,6	1,8	1,8	2,1	2,1		
a max.		1,6	2,2	2,6	2,8	3,2	3,6	3,6	4,2	4,2		
d_k	Theoretical ^b max.	4,4	6,3	8,2	9,4	10,4	11,5	12,6	17,3	20,0		
	Actual	max.	3,8	5,5	7,3	8,4	9,3	10,3	11,3	15,8	18,3	
		min.	3,5	5,2	6,9	8,0	8,9	9,9	10,9	15,4	17,8	
f ≈		0,5	0,7	0,8	1,0	1,2	1,3	1,4	2,0	2,3		
k max.		1,10	1,70	2,35	2,60	2,80	3,00	3,15	4,65	5,25		
r max.		0,8	1,2	1,4	1,6	2,0	2,2	2,4	3,2	4,0		
r_f ≈		4,0	6,0	8,5	9,5	9,5	11,0	12,0	16,5	19,5		
Cross recess	Recess No		0	1	2		3		4			
	Type H	m ref.	1,9	3,2	4,4	4,6	5,2	6,6	6,8	8,9	10,0	
		Penetration	max.	1,2	2,1	2,4	2,6	3,2	3,3	3,5	4,6	5,7
			min.	0,9	1,7	1,9	2,1	2,7	2,8	3,0	4,0	5,1
	Type Z	m ref.	2,0	3,0	4,1	4,4	4,9	6,3	6,6	8,8	9,8	
		Penetration	max.	1,20	2,01	2,20	2,51	3,05	3,18	3,45	4,60	5,64
			min.	0,95	1,76	1,75	2,06	2,60	2,73	3,00	4,15	5,19
y ref.	Type C		2,0	2,6	3,2	3,7	4,3	5,0	6,0	7,5	8,0	
	Type F		1,6	2,1	2,5	2,8	3,2	3,6	3,6	4,2	4,2	
	Type R		—	—	2,7	3,2	3,6	4,3	5,0	6,3	—	
l^c												
	Type C and Type R		Type F									
nom.	min.	max.	min.	max.								
4,5	3,7	5,3	3,7	4,5								
6,5	5,7	7,3	5,7	6,5								
9,5	8,7	10,3	8,7	9,5								
13	12,2	13,8	12,2	13,0	Range							
16	15,2	16,8	15,2	16,0	of							
19	18,2	19,8	18,2	19,0	preferred							
22	21,2	22,8	20,7	22,0	lengths							
25	24,2	25,8	23,7	25,0								
32	30,7	33,3	30,7	32,0								
38	36,7	39,3	36,7	38,0								
45	43,7	46,3	43,5	45,0								
50	48,7	51,3	48,5	50,0								
<p>^a P = pitch of the thread.</p> <p>^b In accordance with ISO 7721.</p> <p>^c Sizes with lengths marked with a dash (—) cannot be manufactured.</p>												

4 Specifications and reference International Standards

See Table 2.

Table 2 — Specifications and reference International Standards

Material	Steel, in accordance with ISO 2702	Stainless steel
General requirements	ISO 8992	
Thread	ISO 1478	
Cross recess	ISO 4757, ISO 7721-2	
Mechanical property	Steel grade/hardness class	— A2-20H, A4-20H, A5-20H
	International Standard	ISO 2702 ISO 3506-4
Tolerances	Product grade	A
	International Standard	ISO 4759-1
Finish — Coating	As processed	
	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.	Requirements for passivation are specified in ISO 16048.
Acceptability	Acceptance inspection is specified in ISO 3269.	

5 Designation

EXAMPLE 1 A cross-recessed raised countersunk (oval) head tapping screw with thread size ST 3,5, nominal length $l = 16$ mm, made of steel (St) in accordance with ISO 2702, rounded end (Type R) and cross recess Type Z is designated as follows:

Tapping screw ISO 7051 - ST 3,5 × 16 - St - R - Z

EXAMPLE 2 A cross-recessed raised countersunk (oval) head tapping screw with thread size ST 3,5, nominal length $l = 16$ mm, made of stainless steel (A4-20H) in accordance with ISO 3506-4, rounded end (Type R) and cross recess Type H is designated as follows:

Tapping screw ISO 7051 - ST 3,5 × 16 - A4-20H - R - H