Саморезы с прессшайбой

September 1995

Self-drilling tapping screws
Dimensions, requirements and testing

DIN 7504

ICS 21.060.10

Supersedes February 1992 edition.

Descriptors: Self-drilling tapping screws, tapping screws, fasteners.

Bohrschrauben mit Blechschrauben-Gewinde; Maße, Anforderungen, Prüfung

In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

Foreword

This standard has been prepared by the *Normenausschuß Mechanische Verbindungselemente* (Fasteners Standards Committee).

Amendments

The following amendments have been made to the February 1992 edition.

a) Types N, P and Q screws are no longer included.

b) The standard has been editorially revised.

Previous editions

DIN 7504: 1982-11, 1992-02.

1 Scope and field of application

This standard specifies dimensions, requirements and test methods for heat-treated self-drilling tapping screws ('tapping screws', for short). These screws have a drill point with which they form a pilot hole during assembly, followed by a threaded section with which they form their mating thread, either in a forming or in a cutting operation. See the relevant DIN Standards and ISO Standards for head styles and threads of self-drilling screws.

The specifications of this standard are intended to ensure that tapping screws are capable of performing the above functions without their own thread fracturing or becoming deformed. To that end, requirements have been specified for surface hardness, drilling and thread forming capability and torsional strength.

2 Normative references

This standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

DIN 962
Designation system for fasteners

DIN 4000-2
Tabular layouts of article characteristics for bolts, screws and nuts

DIN 6928
Hexagon washer head tapping screws

DIN 17 210
Case hardening steel; technical delivery conditions

DIN 50 133
Vickers hardness testing of metallic materials; HV 0,2 to HV 100

DIN EN 10 083-1
Quenched and tempered steels; technical delivery conditions for special steels

DIN EN 10 083-2
Quenched and tempered steels; technical delivery conditions for unalloyed quality steels

DIN EN ISO 2702
Heat-treated steel tapping screws; mechanical properties (ISO 2702 : 1992)

ISO 3269 : 1988
Fasteners; acceptance inspection

ISO 4042 : 1989
Threaded components; electroplated coatings

ISO 7049 : 1983
Cross recessed pan head tapping screws

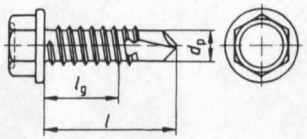
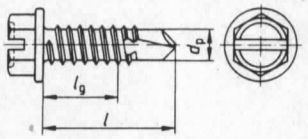
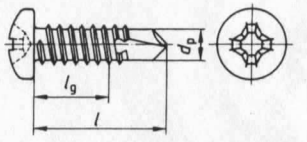
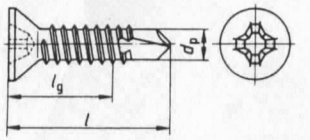
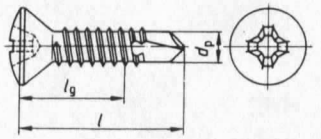
ISO 7050 : 1983
Cross recessed countersunk (flat) head tapping screws (common head style)

ISO 7051 : 1983
Cross recessed raised countersunk (oval) head tapping screws

Continued on pages 2 to 6.

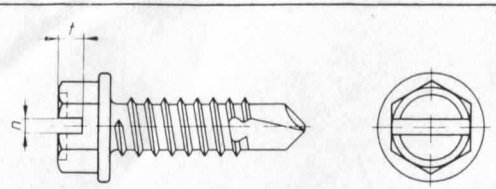
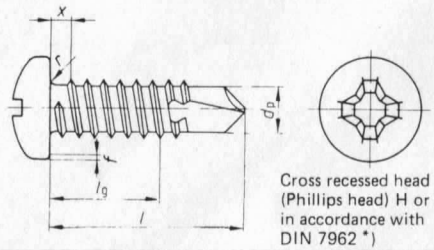
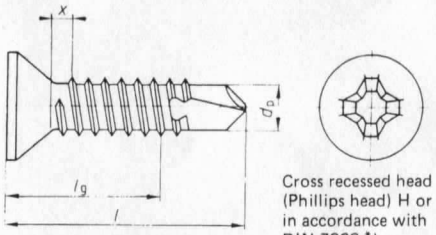
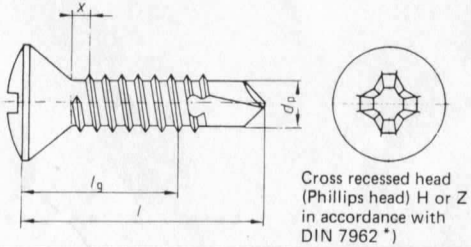
2 Dimensions and designations

Table 1: Screw types and designations

Type	Illustration	Other dimensions as in	Example of designation
K		DIN 6928	Screw DIN 7504 – ST4,2 × 13 – K
L		DIN 6928; slot dimensions as in DIN 962	Screw DIN 7504 – ST4,2 × 13 – L
M	 Type H or Z cross recess	ISO 7049	Screw DIN 7504 – ST4,2 × 13 – M – H
O	 Type H or Z cross recess	ISO 7050	Screw DIN 7504 – ST4,2 × 13 – O – H
R	 Type H or Z cross recess	ISO 7051	Screw DIN 7504 – ST4,2 × 13 – R – H

The DIN 4000 – 2 – 1 tabular layout of article characteristics shall apply to screws as covered in this standard.

Table 1. (continued)

Type	Figure	Remaining dimensions in accordance with	Example of designation
L	 Remaining dimensions as for type K	Table 3	Drilling screw DIN 7504 – ST 4,2 X 13 – L
N	See table 3 for *f* and *r*  Cross recessed head (Phillips head) H or Z in accordance with DIN 7962 *)	DIN 7981 *)	Drilling screw DIN 7504 – ST 4,2 X 13 – N – H
P	 Cross recessed head (Phillips head) H or Z in accordance with DIN 7962 *)	DIN 7982 *)	Drilling screw DIN 7504 – ST 4,2 X 13 – P – H
Q	 Cross recessed head (Phillips head) H or Z in accordance with DIN 7962 *)	DIN 7983 *)	Drilling screw DIN 7504 – ST 4,2 X 13 – Q – H

x max. = *P*

*) At present at the stage of draft

Note: The letters A to J and M have not been used to designate the types, in order to avoid the possibility of confusion with conventional designations for self-tapping screws and metric screws.

Tabular layout of article characteristics DIN 4000 – 2 – 1 applies to screws in accordance with this standard

Table 2. **Drilling range and screw lengths**

Screw thread *d*			ST 2,9	ST 3,5	(ST 3,9)	ST 4,2	ST 4,8	ST 5,5	ST 6,3
Drilling range (sheet or plate thickness) [1]	from		0,7	0,7	0,7	1,75	1,75	1,75	2
	to		1,9	2,25	2,4	3	4,4	5,25	6
d_p [2]		max.	2,3	2,8	3,1	3,6	4,1	4,8	5,8
Nominal length	*l* min.	*l* max.	l_g min.						
9,5	8,75	10,25	3,25 [3]	2,85 [3]					
13	12,1	13,9	6,6	6,2	5,8	4,3	4,7 [3]		
16	15,1	16,9	9,6	9,2	8,8	7,3	5,8	5 [3]	
19	18	20	12,5	12,1	11,7	10,3	8,7	8	7
22	21	23		15,1	14,7	13,3	11,7	11	10
25	24	26		18,1	17,7	16,3	14,7	14	13
32	30,75	33,25			24,5	23	21,5	21	20
38	36,75	39,25			30,5	29	27,5	27	26
45	43,75	46,25					34,5	34	33
50	48,75	51,25					39,5	39	38

[1] In order to determine the nominal length *l* it may be necessary to add an air gap (if present) to the individual sheet or plate thicknesses.

[2] The diameter d_p is dependent on the technical process and it presupposes operational capability in accordance with table 5.

[3] These lengths are not applicable to countersunk head screws.

Table 3. **Head dimensions of type K and L screws**

Screw thread *d*			ST 3,5	(ST 3,9)	ST 4,2	ST 4,8	ST 5,5	ST 6,3
c		min.	0,6	0,6	0,9	0,9	1	1
d_c		max.	8,3	8,3	8,8	10,5	11	13,2
		min.	7,6	7,6	8,2	9,8	10	12,2
f [1]		≈	0,4	0,4	0,4	0,5	0,5	0,5
e		min.	5,96	5,96	7,59	8,71	8,71	10,95
k		max.	3,45	3,45	4,25	4,45	5,45	6,45
		min.	3,2	3,2	4	4,15	5,15	6,15
k' [2]		min.	1,55	1,55	1,9	2	2,7	3,3
n	Nominal dimension		1	1	1,2	1,2	1,6	1,6
		min.	1,06	1,06	1,26	1,26	1,66	1,66
		max.	1,2	1,2	1,51	1,51	1,91	1,91
r		max.	0,5	0,5	0,6	0,7	0,8	0,9
s	max. = nominal dimension *s*		5,5	5,5	7	8	8	10
		min.	5,32	5,32	6,78	7,78	7,78	9,78
t		min.	1	1	1,2	1,4	1,6	1,8
		max.	1,4	1,4	1,6	1,8	2	2,2

[1] Chamfer necessary for manufacturing reasons

[2] Minimum depth required to ensure proper grip by the wrench; the dimension e_{min} must be present within this range.

The ST 3,9 screw thread featured in brackets in the above table should be avoided wherever possible.