UDC 621.882.215.3.082.8 August 1990

# Slotted countersunk head tapping screws

DIN 7972

Senk-Blechschrauben mit Schlitz

Supersedes March 1988 edition.

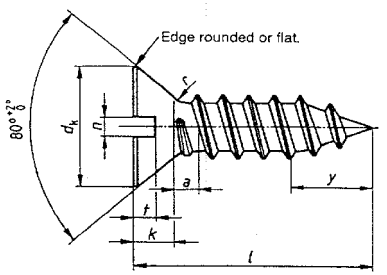
*In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.*

This standard should be used together with ISO 1482. For details, see Explanatory notes. It is intended to withdraw the present standard by 31 July 1995 at the latest.

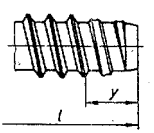
Dimensions in mm

## 1 Dimensions

**Type C,** with cone point
(previously, type B)




**Type F,** with long dog point
(previously, type BZ)




Other dimensions as shown at left.

Table 1.

| Thread size | | ST 2,2 | ST 2,9 | ST 3,5 | (ST 3,9) | ST 4,2 | ST 4,8 | ST 5,5 | ST 6,3 |
|---|---|---|---|---|---|---|---|---|---|
| $P$[1] | | 0,8 | 1,1 | 1,3 | 1,3 | 1,4 | 1,6 | 1,8 | 1,8 |
| $a$ | max. | 0,8 | 1,1 | 1,3 | 1,3 | 1,4 | 1,6 | 1,8 | 1,8 |
| $d_k$ | max. = nominal size | 4,3 | 5,5 | 6,8 | 7,5 | 8,1 | 9,5 | 10,8 | 12,4 |
| | min. | 4 | 5,2 | 6,44 | 7,14 | 7,74 | 9,14 | 10,37 | 11,97 |
| $k$ | ≈ | 1,3 | 1,7 | 2,1 | 2,3 | 2,5 | 3 | 3,4 | 3,8 |
| $n$ | Nominal size | 0,6 | 0,8 | 1 | 1 | 1,2 | 1,2 | 1,6 | 1,6 |
| | min. | 0,66 | 0,86 | 1,06 | 1,06 | 1,26 | 1,26 | 1,66 | 1,66 |
| | max. | 0,8 | 1 | 1,2 | 1,2 | 1,51 | 1,51 | 1,91 | 1,91 |
| $r$ | max. | 0,8 | 1,1 | 1,4 | 1,5 | 1,6 | 1,9 | 2,1 | 2,4 |
| $t$ | min. | 0,4 | 0,5 | 0,6 | 0,7 | 0,75 | 0,85 | 1 | 1,2 |
| | max. | 0,6 | 0,75 | 0,95 | 1,05 | 1,15 | 1,35 | 1,5 | 1,75 |
| $y$ max. | Type C | 2 | 2,6 | 3,2 | 3,5 | 3,7 | 4,3 | 5 | 6 |
| | Type F | 1,6 | 2,1 | 2,5 | 2,7 | 2,8 | 3,2 | 3,6 | 3,6 |

| Nominal size | $l$ Type C min. | $l$ Type C max. | $l$ Type F min. | $l$ Type F max. | Approximate mass (7,85 kg/dm³), per 1000 units, in kg | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **6,5** | 5,7 | 7,3 | 5,7 | 6,5 | 0,140 | 0,242 | | | | | | |
| **9,5** | 6,7 | 10,3 | 8,7 | 9,5 | 0,200 | 0,350 | 0,548 | 0,658 | 0,775 | 1,10 | | |
| **13** | 12,2 | 13,8 | 12,2 | 13 | 0,270 | 0,476 | 0,722 | 0,880 | 1,02 | 1,45 | 2,11 | 2,53 |
| **16** | 15,2 | 16,8 | 15,2 | 16 | 0,330 | 0,584 | 0,871 | 1,07 | 1,23 | 1,75 | 2,49 | 3,07 |
| **19** | 18,2 | 19,8 | 18,2 | 19 | | 0,692 | 1,02 | 1,26 | 1,44 | 2,05 | 2,87 | 3,61 |
| **22** | 21,2 | 22,8 | 20,7 | 22 | | | 1,17 | 1,45 | 1,65 | 2,35 | 3,26 | 4,15 |
| **25** | 24,2 | 25,8 | 23,7 | 25 | | | 1,32 | 1,64 | 1,86 | 2,65 | 3,65 | 4,69 |
| **32** | 30,7 | 33,3 | 30,7 | 32 | | | | | 2,35 | 3,35 | 4,56 | 5,95 |
| **38** | 36,7 | 39,3 | 36,7 | 38 | | | | | | 3,95 | 5,34 | 7,03 |

Commercial sizes are those screws for which a value of mass has been specified. These values are for guidance only. The thread size in brackets should be avoided if possible. The core hole diameter shall be as specified in DIN 7975.

[1] $P$ = pitch of thread.

Continued on pages 2 and 3

## 2 Technical delivery conditions

Table 2.

| Material | Steel |
|---|---|
| General requirements | As specified in DIN 267 Part 1. |
| Screw threads and thread ends | As specified in DIN 7970. |
| Mechanical properties and material | As specified in DIN 267 Part 12. |
| Limit deviations and geometrical tolerances | Product grade A as specified in ISO 4759 Part 1[1]. |
| Surface finish | As processed.<br>DIN 267 Part 2 shall apply with regard to surface roughness.<br>DIN 267 Part 19 shall apply with regard to permissible surface discontinuities[2].<br>DIN 267 Part 9 shall apply with regard to electroplating, other types of surface protection being subject to agreement. |
| Acceptance inspection | DIN 267 Part 5 shall apply with regard to acceptance inspection. |

[1] Although ISO 4759 Part 1 covers only screws with ISO metric thread, the tolerances specified there have been adopted by analogy for tapping screws.

[2] Although DIN 267 Part 19 covers only screws with ISO metric thread, the specifications for surface discontinuities given there have been adopted by analogy for tapping screws.

## 3 Designation

Designation of an ST 3,5 countersunk head tapping screw of length, $l$ (nominal size) = 13 mm, with cone point (type C):

Tapping screw DIN 7972 – ST 3,5 × 13 – C

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

## Standards referred to

| | |
|---|---|
| DIN 267 Part 1 | Fasteners; technical delivery conditions; general requirements |
| DIN 267 Part 2 | Fasteners; technical delivery conditions; design and dimensional accuracy |
| DIN 267 Part 5 | Fasteners; technical delivery conditions; acceptance inspection (modified version of ISO 3269, 1984 edition) |
| DIN 267 Part 9 | Fasteners; technical delivery conditions; electroplated parts |
| DIN 267 Part 12 | Fasteners; technical delivery conditions; tapping screws |
| DIN 267 Part 19 | Fasteners; technical delivery conditions; surface discontinuities on bolts |
| DIN 4000 Part 2 | Tabular layouts of article characteristics for screws and nuts |
| DIN 7970 | Threads and thread ends for tapping screws (modified version of ISO 1478) |
| DIN 7975 | Tapping screws; application and core hole diameters |
| ISO 4759 Part 1 | Tolerances for fasteners; bolts, screws and nuts with thread diameters from 1,6 to 150 mm; product grades A, B and C |

## Previous editions

DIN 7509: 04.43; DIN 7972 : 08.52, 12.56, 07.70, 03.88.

## Amendments

The following amendments have been made to the March 1988 edition.

a) A note on the period of validity has been included.

b) For thread size ST 3,9, the values of pitch, $P$, and dimension $a$ have been amended.

c) The standard has been editorially revised.

## Explanatory notes

In 1983, ISO 7721 was published in order to establish a common head style for all types of countersunk head screws. In the same year, a number of ISO Standards on metric countersunk head screws and countersunk head tapping screws with head styles complying with the specifications given in ISO 7721 were published. In these standards, a countersunk angle of 90° was specified for both types of screw, this being a departure from the previous international specification of tapping screws with an 80° angle. The performance of screws with a 90° angle was verified in a number of tests.

Although the decision to introduce the ISO common head style as established in ISO 7721 was made in 1977, it took quite a long time for this style to be adopted in national standards since ISO 7721 was primarily concerned with reducing the variety of screw heads but not with specifying other properties of such screws. The question was also whether it would be justifiable to ignore an International Standard on tapping screws and, instead, to introduce a head style for Germany only. In 1987, several countries, among them Germany, proposed to reconsider the decision to introduce the ISO common head style for tapping screws, where it was found that the majority of member countries had already adopted the ISO head in their national standards. The responsible ISO Committee, therefore agreed not to make any alterations to the 1983 version of ISO 7721.

Taking the international development into account, the responsible German committee came to the conclusion that adoption of the international specifications on countersunk head screws would be inevitable, and decided to issue national standards on countersunk head screws with ISO head, granting, however, an adequate transition period after which the relevant DIN Standards would be withdrawn.

The decision to adopt the ISO head was seen to be justified by the formation of CEN/TC 185, Fasteners, in 1989 since relevant European Standards dealing with such screws will be published shortly. Note that such EN Standards will be accepted only if they agree with existing ISO Standards, to avoid another transition, and that the transition period mentioned on page 1 may be shorter if the EN Standards appear sooner than expected.

The following table, which compares the most essential head dimensions of screws, is intended to make it easier for the user to see whether screws are interchangeable. Note that the decision on interchangeability has to be made on case-to-case basis.

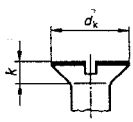



Table 3. Values given in mm

| | Thread size | ST2,2 | ST2,9 | ST3,5 | ST3,9 | ST4,2 | ST4,8 | ST5,5 | ST6,3 | ST8 | ST9,5 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $d_k$ max. | ISO 1482 | 3,8 | 5,5 | 7,3 | – | 8,4 | 9,3 | 10,3 | 11,3 | 15,8 | 18,3 |
| | DIN 7972 | 4,3 | 5,5 | 6,8 | 7,5 | 8,1 | 9,5 | 10,8 | 12,4 | – | – |
| $k$ max. | ISO 1482 | 1,1 | 1,7 | 2,35 | – | 2,6 | 2,8 | 3 | 3,15 | 4,65 | 5,25 |
| | DIN 7972 | 1,3 | 1,7 | 2,1 | 2,3 | 2,5 | 3 | 3,4 | 3,8 | – | – |

Note. In order to facilitate the use of ISO 7721 countersunk head screws, a standard on mating countersinks, DIN 66, has been published.

## International Patent Classification

F 16 B 35/04