

Thread and Screw Ends
for Tapping Screws

DIN
7970

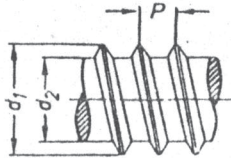
Gewinde und Schraubenenden für Blechschrauben

For connection with an ISO Recommendation in preparation, see Explanations.

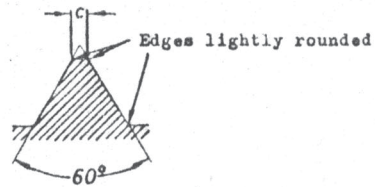
Dimensions in mm

自攻螺釘螺紋
及其尖端

Thread

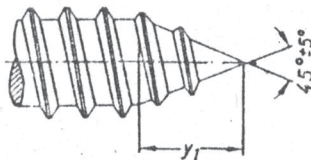


Thread profile

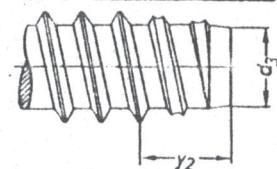


Screw end

Type B with cone end



Type BZ with flat end



Designation of a tapping screw thread of 3.5 mm nominal diameter:
Thread 3.5 DIN 7970

Nominal diameter		2,2	2,9	3,5	3,9	4,2	4,8	5,5	6,3	8
d_1	h13	2,24	2,9	3,53	3,91	4,22	4,8	5,46*	6,25	8
d_2	h12	1,63	2,18	2,64	2,92	3,1	3,58	4,17	4,88	6,2
d_3	h13	1,5	2 ^f	2,4	2,7	2,9	3,3	3,9	4,5	5,8
c	≈	0,1	0,1	0,1	0,1	0,1	0,15	0,15	0,15	0,15
P		0,79	1,06	1,27	1,34	1,41	1,59	1,81	1,81	2,12
y_1	max.	2	2,6	3,2	3,5	3,7	4,3	5	6	7,5
y_2	max.	1,6	2,1	2,5	2,7	2,8	3,2	3,6	3,6	4,2
No according to ISO		2	4	6	7	8	10	12	14	16

For core hole diameters for tapping screws, see DIN 7975

Explanations on page 2

No guarantee can be given in respect of this translation
In all cases the latest German-language version of this standard shall be taken as authoritative

Nachdruck, auch auszugsweise, nur mit Genehmigung des DIN Deutsches Institut für Normung e. V., Berlin 30, gestattet.

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Explanations

The first issue of DIN 7970 appeared in 1952 and was virtually in agreement with the American standard ASA B 18.6-1947. The inch dimensions quoted in the latter were merely converted to metric dimensions and - where appropriate - rounded. On revision of the Standard in 1956 this principle, which in the meantime has also become established in other metric countries, was retained.

In recent years the Technical Committee ISO/TC 2 "Bolts, nuts and accessories" of the "International Organization for Standardization" has been dealing with ISO Recommendations for tapping screws with slot and has decided with a big majority to adopt the American standards in full. Corresponding ISO drafts have already been passed.

The content of this new issue of DIN 7970 agrees essentially with ISO Draft

Draft ISO Recommendation No 1478

Tapping screw thread, metric and inch series

Filetage de vis à tête, dimensions en millimètres et inches

In the past, DIN 7970 conformed to ASA B 18.6-1947 by standardizing tapping screw threads with coarse pitch (A) and fine pitch (B), although preference was given to the finer pitch.

The two types of thread were not built up on a strictly logical basis, in the technical sense, and were not matched to each other.

ISO has therefore adopted only the fine pitch thread. Technical reasons and practice hitherto argued entirely in favour of the finer pitch which, for example, also allows relatively thin sheets to be screwed together without the necessity of using speed nuts or specially shaped holes.

The envisaged ISO Recommendation defines the thread sizes by numbers in accordance with the ANSI standard. These numbers have only limited usefulness. Therefore, in order to denote the threads, the nominal diameters (outside diameters) previously used have been retained and the ISO numbers quoted only for information purposes.

International practice uses the type letter symbols of the ANSI standard to denote types with cone end and with flat end. Adoption of these type letter symbols would have necessitated amending existing documents and introducing new standard specification numbers for all DIN standards dealing with tapping screws. For this reason the old type letter symbols have been retained. The following situation has therefore arisen:

Type B with cone end according to DIN 7970 = Type AB according to ISO

Type BZ with flat end according to DIN 7970 = Type B according to ISO

It is appropriate at this stage to draw attention to the risk of possible confusion. On the basis of the maximum dimensions according to ISO, tolerance zones h13 and h12 have been assigned to the outside and minor diameters, as before. This discrepancy compared with the ISO Recommendation, does not prejudice interchangeability, as the following Table shows:

Nominal diameter		2,2	2,9	3,5	3,9	4,2	4,8	5,5	6,3	8
No according to ISO		2	4	6	7	8	10	12	14	16
Outside diameter d_1	max. DIN and ISO	2,24	2,90	3,53	3,91	4,22	4,80	5,46	6,25	8,00
	DIN	2,10	2,76	3,35	3,73	4,04	4,62	5,28	6,03	7,78
	min. ISO	2,13	2,79	3,43	3,78	4,09	4,65	5,31	6,10	7,82
Minor diameter d_2	max. DIN and ISO	1,63	2,18	2,64	2,92	3,10	3,58	4,17	4,88	6,20
	DIN	1,53	2,08	2,54	2,82	2,98	3,46	4,05	4,76	6,05
	min. ISO	1,52	2,08	2,51	2,77	2,95	3,43	3,99	4,70	5,99

The maximum difference between DIN and ISO is +0.08 mm in the tolerance on outside diameter and -0.06 mm in the tolerance on minor diameter.

Whereas the American standard and the ISO draft also gave the larger tolerance to the minor diameter, the preference in Germany was, and is, to allocate the larger tolerance to the major diameter. The core hole (DIN 7975) is matched to the minor diameter, and the wire rod likewise, so that reasons of production practice likewise argue clearly for continuing past usage. The limiting dimensions of the outside diameter are far more dependent on the actual dimension of the wire rod than the minor diameter which can be fixed much more accurately. In addition, in thread rolling the outside diameter cannot be held consistently within narrow limits over the whole thread length.

The ISO Recommendation also lists nominal diameters 1.5, 1.9, 2.6 and 3.3 mm, which are designated by the numbers 0, 1, 3 and 5. Since these sizes are not needed in Germany they have not been included in DIN 7970.

The ISO Recommendation also gives maximum and minimum dimensions for the lengths of end y_2 , and these differ again between "short screws" and "long screws". The adoption of detailed provisions of this kind was not deemed necessary because it is difficult to measure the length of flat ends. The maximum length stated in DIN 7970 for flat ends corresponds with the maximum end lengths for "long screws" according to ISO.

Simultaneously with this Standard, new issues of DIN 7971, DIN 7972, DIN 7973, DIN 7975, DIN 7976, DIN 7981, DIN 7982 and DIN 7983 are also appearing, and these likewise are based on finalized ISO drafts. The standard DIN 7974 is being withdrawn because round head screws have not been adopted internationally for an ISO Recommendation and also no national requirement for a round head could be established.