Studs
with a length of engagement equal to about 2,5 d

DIN 940

ICS 21.060.10

Supersedes March 1983 edition.

Descriptors: Fasteners, studs.

Stiftschrauben; Einschraubende ≈ 2,5 d

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.

The studs specified in DIN 949-2 shall be given preference over those specified in the present standard, as the latter is to be withdrawn by 31 December 1999 at the latest (see Explanatory notes).

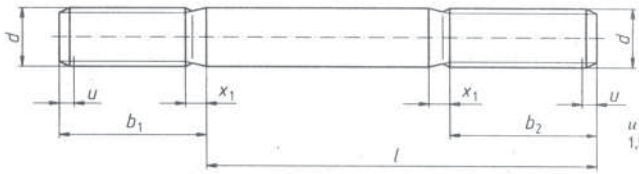
Dimensions in mm

1 Scope and field of application

This standard specifies dimensions and technical delivery conditions for studs intended for use mainly in light metals of low strength. As specified in DIN 267-2, the stud end thread shall be produced to tolerance Sk6 as in DIN 13-51, unless the stud is designated Fo ('without interference-fit thread') or Sn4.

2 Dimensions

DIN 78 — K type nut end



u (incomplete thread): 1,5 P maximum.

b_1 = stud end
b_2 = nut end

Continued on pages 2 to 4.

Table 1: Dimensions

d	M4 — —	M5 — —	M6 — —	(M7) — —	M8 M8×1 —	M10 M10×1,25 —	M12 M12×1,25 M12×1,5	(M14) (M14×1,5) —	M16 M16×1,5 —	(M18) (M18×1,5) —	M20 M20×1,5 —	(M22) (M22×1,5) —	M24 M24×2 —
b_1	10	13	15	18	20	25	30	35	40	45	50	55	60
[1])	14	16	18	20	22	26	30	34	38	42	46	50	54
b_2 [2])	20	22	24	26	28	32	36	40	44	48	52	56	60
[3])	—	—	—	—	—	45	49	53	57	61	65	69	73
x_1	1,75	2,0	2,5	2,5	3,2	3,8	4,3	5,0	5,0	6,3	6,3	6,3	7,5
l js15	Approximate mass (7,85 kg/dm³) per 1000 units, in kg												
12													
(14)													
16													
(18)													
20	2,14												
(22)	2,61	4,46											
25	2,90	4,92	7,26										
(28)	3,20	5,38	7,93	11,8									
30	3,40	5,69	8,37	12,4	16,3								
35	3,89	6,46	9,48	13,9	18,3	30,7							
40	4,38	7,23	10,6	15,4	20,2	33,8	51,9						
45		8,00	11,7	16,9	22,2	36,9	56,3	80,9					
50		8,77	12,8	18,4	24,2	39,9	60,8	86,9	122				
55			13,9	20,0	26,2	43,0	65,2	93,0	130	167			
60			15,0	21,5	28,1	46,1	69,7	99,0	138	177	232		
65				23,0	30,1	49,2	74,1	105	146	187	244	311	
70				24,5	32,1	52,3	78,5	111	154	197	257	326	394
75					34,1	55,4	83,0	117	161	207	269	341	412
80					36,0	58,4	87,4	123	169	217	281	356	430
(85)						61,5	91,9	129	177	227	294	371	447
90						64,6	96,3	135	185	237	306	386	465
(95)						67,7	101	141	193	247	318	401	483
100						70,8	105	147	201	257	331	415	501
110							114	159	217	277	355	445	536
120							123	172	232	297	380	475	572
130								184	248	317	405	505	607
140								196	264	337	429	535	643
150									280	357	454	565	678
160									296	377	479	594	714
170										397	503	624	749
180										417	528	654	785
190											553	684	820
200											577	714	856

[1]) For lengths, l, of 125 mm or less.

[2]) For lengths, l, above 125 mm up to 200 mm.

[3]) For lengths, l, exceeding 200 mm.

Lengths above 200 mm shall be graded in 20 mm steps.

Bracketed sizes and intermediate lengths shall be avoided if possible.

The zone between the continuous thick lines indicates the range of commercial sizes of studs with coarse pitch thread.

Studs of sizes above this range cannot be manufactured with a nut end thread length, b_2, as specified in the table. In such cases, b_2 will be approximately equal to $l - (x_1 + 3)$. For sizes above the dashed line, $b_2 + x_1$ will be less than 1,2 b_1. The nut end of these studs shall be rounded (i.e. given a DIN 78—L type end), unless the end is already marked with the property class.

3 Technical delivery conditions

Table 2: Technical delivery conditions

Material		Steel	
General requirements		As specified in ISO 8992.	
Thread	Tolerance	Stud end: Sk6.	Nut end: 6g.
	As specified in	DIN 13-51.	DIN 13-12 and DIN 13-15.
Mechanical properties	Property class (material) [1])	5.6 or 8.8	
	As specified in	DIN EN 20 898-1.	
Limit deviations, geometrical tolerances	Product grade	A	
	As specified in	ISO 4759-1.	
Surface finish		Property class 5.6: as processed. Property class 8.8: (thermally or chemically) blackened. DIN 267-2 shall apply with regard to surface roughness. DIN EN 26 157-3 shall apply with regard to limits for surface discontinuities. ISO 4042 shall apply with regard to electroplating. The limits of thread size shall also apply after coating.	
Acceptance inspection		As specified in ISO 3269.	

[1]) Use of other property classes or materials shall be subject to agreement.

4 Designation

Designation of an M12 stud with interference-fit thread as in DIN 13-51, with a nominal length, *l*, of 80 mm, and assigned to property class 8.8:

Stud DIN 940 — M12 × 80 — 8.8

Designation of an M12 stud without interference-fit thread (Fo), with a nominal length, *l*, of 80 mm, and assigned to property class 8.8:

Stud DIN 940 — M12 Fo × 80 — 8.8

Where studs are to be supplied with a different thread on either end, this shall be indicated in the designation, with the symbol for the thread of the stud end preceding that for the nut end, e.g.:

Stud DIN 940 — M12 — M12 × 1,25 × 80 — 8.8

DIN 962 shall apply to the designation of type and finish, with additional information to be given on ordering.

The DIN 4000 — 2 — 4 tabular layout of article characteristics shall apply to studs as covered in this standard.

Standards and other document referred to

DIN 13-12	ISO metric screw threads; coarse and fine pitch threads with diameters from 1 to 300 mm; selected diameters and pitches
DIN 13-15	ISO metric screw threads; fundamental deviations and tolerances for screw threads of 1 mm diameter and larger
DIN 13-51	ISO metric screw threads; external threads for transition fits; tolerances, limit deviations and limits of size
DIN 78	Stud ends and lengths of projection of bolt ends for ISO metric screw threads in accordance with DIN 13
DIN 267-2	Fasteners; technical delivery conditions; design and dimensional accuracy
DIN 962	Bolts, screws, studs and nuts; designation of types and finishes
DIN 4000-2	Tabular layouts of article characteristics for bolts, screws and nuts
DIN EN 20 898-1	Mechanical properties of fasteners; bolts, screws and studs (ISO 898-1 : 1988)
DIN EN 26 157-3	Fasteners; surface discontinuities; bolts, screws and studs for special requirements (ISO 6157-3 : 1988)
ISO 3269 : 1988	Fasteners; acceptance inspection
ISO 4042 : 1989	Threaded components; electroplated coatings
ISO 4759-1 : 1978	Tolerances for fasteners; bolts, screws and nuts with thread diameters from 1,6 to 150 mm; product grades A, B and C
ISO 8992 : 1986	Fasteners; general requirements for bolts, screws, studs and nuts

H.J. Bestenreiner. *Metrisches ISO-Gewinde; Gewinde für Festsitz in Leichtmetall-Legierungen (DIN 8141-1 und DIN 8141-2), DIN-Mitteilungen*, 1993: **72** (7), 411 to 415.

Previous editions

DIN 412: 1921-08, 1923-10; DIN 422: 1921-08, 1923-10; DIN 943-1: 1926-01, 1948-01; DIN 943-2: 1926-01; DIN 940-2: 1926-01; DIN 940-1: 1926-01, 1948-02, 1954-02, 1955-12; DIN 940: 1983-03.

Amendments

The following amendments have been made to the March 1983 edition.

a) By analogy with ISO 4759-1, the length of stud end is now designated b_1.
b) Symbol b has been replaced by b_2.
c) By analogy with DIN 78, symbol z_1 has been replaced by u.
d) The standard has been editorially revised.

Explanatory notes

Recent research on interference-fit threads has shown that tolerance Sk6 specified for the pitch diameter of external threads does not ensure sufficient tightness of fit. Thus, a new interference-fit thread has been developed in which a tight fit is achieved by an increased external thread major diameter (see H.J. Bestenreiner. *Metrisches ISO-Gewinde; Gewinde für Festsitz in Leichtmetall-Legierungen (DIN 8141-1 und DIN 8141-2)* (ISO metric screw thread; interference-fit threads in light metal alloys) (DIN 8141-1 and DIN 8141-2)).

For use in light metals, it is recommended that studs as specified in DIN 949-1 or DIN 949-2 be used which are provided with a DIN 8141-1 interference-fit thread. Such studs are particularly suitable for automatic assembly (e.g. in the automobile industry), since both thread ends can be produced to the same thread limits of size without the strength of the stud/nut assembly being weakened.