February 1995

Studs
with a length of engagement equal to about 1 d

DIN 938

ICS 21.060.10

Supersedes December 1972 edition

Descriptors: Fasteners, studs.

Stiftschrauben; Einschraubende ≈ 1 d

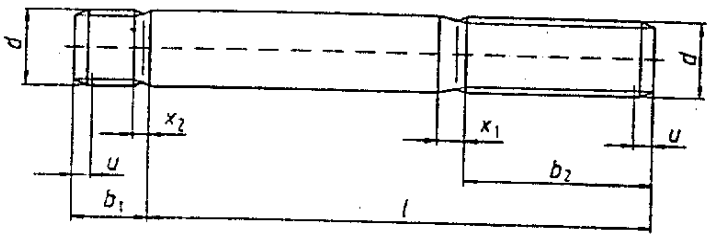
In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

Dimensions in mm

1 Scope and field of application

This standard specifies dimensions and technical delivery conditions for studs intended for use mainly in steel. 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 5.

Table 1: Dimensions

d	M3 — —	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	3	4	5	6	7	8	10	12	14	16	18	20	22	24
b_2 [1] [2] [3]	12 18 —	14 20 —	16 22 —	18 24 —	20 26 —	22 28 —	26 32 45	30 36 49	34 40 53	38 44 57	42 48 61	46 52 65	50 56 69	54 60 73
x_1	1,25	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
x_2	0,7	0,9	1,0	1,25	1,25	1,6	1,9	2,2	2,5	2,5	3,2	3,2	3,2	3,8
l js15	Approximate mass (7,85 kg/dm³) per 1000 units, in kg													
12 (14) 16														
(18) 20 (22)	0,981 1,09 1,20	1,95 2,15	3,47											
25 (28) 30	1,37 1,53 1,64	2,44 2,74 2,94	3,93 4,39 4,70	5,68 6,35 6,79	8,99 9,59	12,5								
35 40 45		3,43 3,93	5,47 6,24 7,01	7,90 9,01 10,1	11,1 12,6 14,1	14,8 16,4 18,4	23,2 26,3 29,4	38,8 43,2	60,0					
50 55 60			7,78	11,2 12,3 13,4	15,6 17,1 18,7	20,4 22,4 24,3	32,4 35,5 38,6	47,7 52,1 56,6	66,0 72,1 78,1	89,6 97,5 105	123 133	170		
65 70 75					20,2 21,7	26,3 28,3 30,3	41,7 44,8 47,9	61,0 65,4 69,9	84,2 90,2 96,3	113 121 129	143 153 163	182 195 207	226 241 256	287 305
80 (85) 90						32,2	50,9 54,0 57,1	74,3 78,8 83,2	102 108 114	137 145 153	173 183 193	219 232 244	271 286 301	323 340 358
(95) 100 110							60,2 63,3	87,6 92,1 101	120 126 139	161 169 184	203 213 233	256 269 293	316 330 360	376 394 429
120 130 140								110	151 163 175	200 216 232	253 273 293	318 342 367	390 420 450	465 500 536
150 160 170										247 263	313 333 353	392 417 441	480 509 539	571 607 642
180 190 200											373	466 491 515	569 599 629	678 713 749

For [1] to [3], see page 3

(continued)

Table 1 (concluded)

d	(M27) (M27×2)	M30 M30×2	(M33) (M33×2)	M36 M36×3	(M39) (M39×3)	M42 M42×3	(M45) (M45×3)	M48 M48×3	(M52) (M52×3)
b_1	25	30	32	35	38	42	45	48	52
b_2 [1] [2] [3]	60 66 79	66 72 85	72 78 91	78 84 97	84 90 103	90 96 109	96 102 115	102 108 121	110 116 129
x_1	7,5	9,0	9,0	10,0	10,0	11,0	11,0	12,5	12,5
x_2	3,8	4,5	4,5	5,0	5,0	5,5	5,5	6,3	6,3
l js15	Approximate mass (7,85 kg/dm³) per 1000 units, in kg								
50 55 60									
65 70 75	392								
80 (85) 90	414 437 459	553 580	718						
(95) 100 110	482 504 549	608 636 691	752 785 852	942 1022	1228				
120 130 140	594 639 684	747 802 858	919 986 1054	1102 1182 1262	1322 1416 1509	1550 1659 1767	1822 1947 2072	2216 2358	2837
150 160 170	729 774 819	913 969 1024	1121 1188 1255	1342 1421 1501	1603 1697 1791	1876 1985 2094	2197 2321 2446	2500 2642 2784	3004 3170 3337
180 190 200	864 909 953	1080 1135 1191	1322 1389 1456	1581 1661 1741	1884 1978 2072	2202 2311 2420	2571 2696 2821	2926 3068 3210	3504 3671 3837
220 240 260	1043 1133 1223	1302 1413 1524	1591 1725 1859	1901 2061 2220	2259 2447 2635	2637 2855 3072	3071 3320 3570	3494 3779 4063	4171 4504 4838
280 300 320	1313	1635 1746	1994 2128 2262	2380 2540 2700	2822 3010 3197	3290 3507 3725	3820 4069 4319	4347 4631 4915	5171 5504 5838
340 360 380 400			2396	2860 3019	3385 3572 3760 3947	3942 4160 4377 4595	4569 4819 5068 5318	5199 5483 5767 6051	6171 6505 6838 7172

[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 400 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, 8.8 or 10.9	
	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 classes 8.8 and 10.9: (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 938 — M12 × 80 — 8.8

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

Stud DIN 938 — 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 938 — 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 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

Previous editions

DIN 938-1: 1926-01, 1943-12, 1951-09, 1953-03; DIN 938: 1972-12.

Amendments

The following amendments have been made to the December 1972 edition.

a) By analogy with ISO 4759-1, the length of the 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) By analogy with DIN 76-1, symbol x has been replaced by x_1.
e) The stud end shall be provided with a run-out, x_2, conforming to DIN 76-1.
f) The standard has been editorially revised.