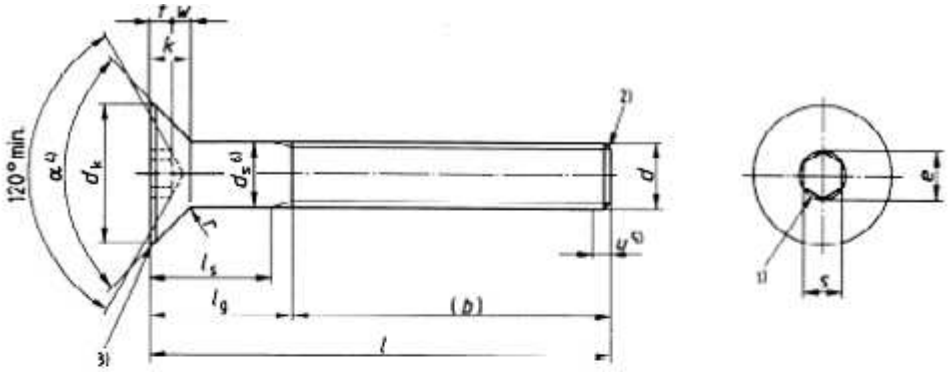
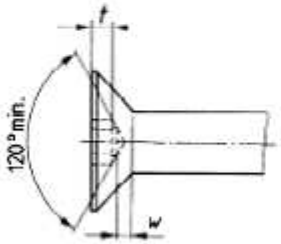
Hexagon socket countersunk head screws



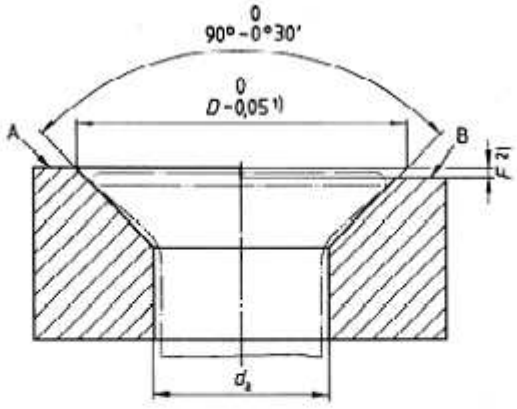
Permissible alternative form of socket



NOTE — For broached sockets which are at the maximum limit of size the overcut resulting from drilling shall not exceed 20 % of the length of any flat of the socket.

1) A slight rounding or countersink at the mouth of the socket is permissible.
2) Point to be chamfered or, for sizes M4 and below "as rolled".
3) Edge of the head to be truncated or rounded.
4) $\alpha = 90°$ to 92°
5) Incomplete thread $u \leq 2P$
6) d_s applies if values of $l_{s\,min}$ are specified.

Tolerances in millimetres



1) $D = d_{a\,max}$ (see table 1).
2) F is the flushness tolerance of the head (see table 1).

NOTE — The top surface of the screw shall be located between the gauge surfaces A and B.

Figure 2 — Flushness gauge

Table 1 — Dimensions

Dimensions in millimetres

Thread (d)			M3	M4	M5	M6	M8	M10	M12	(M14)[1]	M16	M20
P[2]			0,5	0,7	0,8	1	1,25	1,5	1,75	2	2	2,5
b		ref.	18	20	22	24	28	32	36	40	44	52
d_s		max.	3,3	4,4	5,5	6,6	8,54	10,62	13,5	15,5	17,5	22
d_k	theor.	max.	6,72	8,96	11,20	13,44	17,92	22,40	26,88	30,80	33,60	40,32
	actual	min.	5,54	7,53	9,43	11,34	15,24	19,22	23,12	26,52	29,01	36,05
d_c		max.	3,00	4,00	5,00	6,00	8,00	10,00	12,00	14,00	16,00	20,00
		min.	2,86	3,82	4,82	5,82	7,78	9,78	11,73	13,73	15,73	19,67
e[3]		min.	2,3	2,07	3,44	4,58	5,72	6,86	9,15	11,43	11,43	13,72
k		max.	1,86	2,48	3,1	3,72	4,96	6,2	7,44	8,4	8,8	10,16
f[4]		max.	0,25	0,25	0,3	0,35	0,4	0,4	0,45	0,5	0,6	0,75
r		min.	0,1	0,2	0,2	0,25	0,4	0,4	0,6	0,6	0,6	0,8
s[5]		nom.	2	2,5	3	4	5	6	8	10	10	12
		max.[6]	2,045	2,56	3,071	4,084	5,084	6,095	8,115	10,115	10,115	12,142
		max.[7]	2,060	2,58	3,080	4,095	5,140	6,140	8,175	10,175	10,175	12,212
		min.	2,020	2,52	3,020	4,020	5,020	6,020	8,025	10,025	10,025	12,032
t		min.	1,1	1,5	1,9	2,2	3	3,6	4,3	4,5	4,8	5,6
w		min.	0,25	0,45	0,66	0,7	1,16	1,62	1,8	1,62	2,2	2,2

Table 1 *(concluded)*

Thread (d)			M3		M4		M5		M6		M8		M10		M12		(M14)[1]		M16		M20	
	$l^{8)9)}$		Shank length l_s and grip length l_g																			
			l_s	l_g	l_s	l_g	l_s	l_g	l_s	l_g	l_s	l_g	l_s	l_g	l_s	l_g	l_s	l_g	l_s	l_g	l_s	l_g
nom.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
8	7,71	8,29																				
10	9,71	10,29																				
12	11,65	12,35																				
16	15,65	16,35																				
20	19,58	20,42																				
25	24,58	25,42																				
30	29,58	30,42	9,5	12	6,5	10																
35	34,5	35,5			11,5	15	9	13														
40	39,5	40,5			16,5	20	14	18	11	16												
45	44,5	45,5					19	23	16	21												
50	49,5	50,5					24	28	21	26	15,75	22										
55	54,4	55,6							26	31	20,75	27	15,5	23								
60	59,4	60,6							31	36	25,75	32	20,5	28								
65	64,4	65,6									30,75	37	25,5	33	20,25	29						
70	69,4	70,6									35,75	42	30,5	38	25,25	34	20	30				
80	79,4	80,6									45,75	52	40,5	48	35,25	44	30	40	26	36		
90	89,3	90,7											50,5	58	45,25	54	40	50	36	46		
100	99,3	100,7											60,5	68	55,25	64	50	60	46	56	35,5	48

1) Non preferred thread.
2) P is the pitch of the thread.
3) $e_{min} = 1{,}14\, s_{min}$.
4) F is the flushness of the head, see figure 2. The gauge dimension F has the tolerance $^{0}_{-0.01}$.
5) s shall be gauged by attribute methods, see annex A for gauges.
6) For property class 12.9.
7) For all other property classes.
8) Lengths above the dashed stepped line are threaded to head within $3P$. Lengths below the dashed stepped line have values of l_s and l_g according to the following formulae:

$l_{g\,max} = l_{nom} - b$

$l_{s\,min} = l_{g\,max} - 6P$

9) Commercial lengths between the thick stepped lines.

Table 2 — Requirements and reference International Standards

Material		Steel
General requirements	International Standard	ISO 8992
Thread	Tolerance	6g for property classes 8.8 and 10.9; 5g6g for property class 12.9
	International Standards	ISO 261, ISO 965-2, ISO 965-3
Mechanical properties	Property class[1]	8.8, 10.9, 12.9
	International Standard	ISO 898-1
Tolerances	Product grade	A
	International Standard	ISO 4759-1
Finish		Black oxide (thermal or chemical) Requirements for electroplating are covered in ISO 4042. If different electroplating requirements are desired or if requirements are needed for other finishes they should be negotiated between customer and supplier. Limits for surface discontinuities are covered in ISO 6157-1 and ISO 6157-3.
Acceptability		Acceptance procedure is dealt with in ISO 3269.

1) Because of their head configurations, these screws may not meet the minimum ultimate tensile load for property classes 8.8, 10.9 and 12.9, specified in ISO 898-1, when tested in accordance with the test programme B. They shall nevertheless meet the other material and property requirements for property classes 8.8, 10.9 and 12.9 in ISO 898-1.

In addition, when full size screws are loaded with the head supported on a suitable collar (conical bearing surface) using the type of testing fixture illustrated in ISO 898-1 they shall withstand the test loads specified in table 3 without fracture.

If tested to failure, the fracture may occur in the threaded section, the shank, the head or at the head/ shank junction.