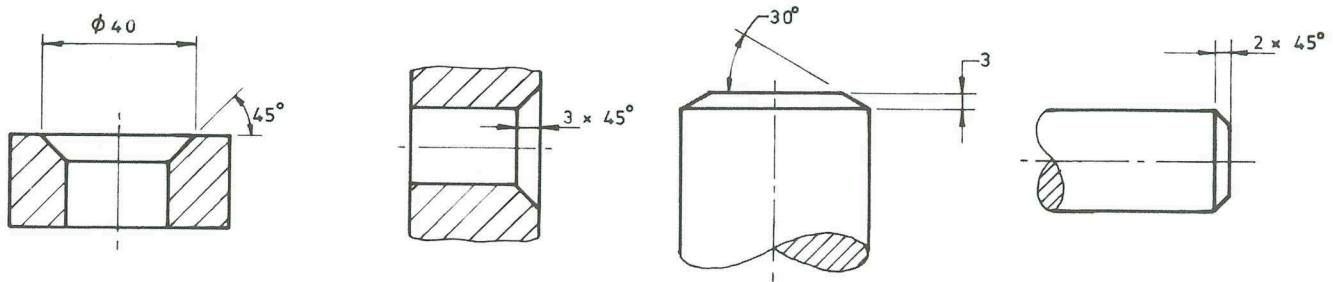


FIGURE 2.18 Methods of dimensioning chamfers



KEYWAYS—SQUARE AND RECTANGULAR

Methods of dimensioning keyways in shafts and hubs, both parallel and tapered, are shown in Figure 2.19, together with suitable proportions for drawing rectangular keys. Enlarged details of key and keyways are shown in Figures 2.20 and 2.21.

Note: Tables 2.2 and 2.3 overleaf give dimensions and tolerances for square and rectangular parallel keyways.

FIGURE 2.19 Methods of dimensioning keys and keyways

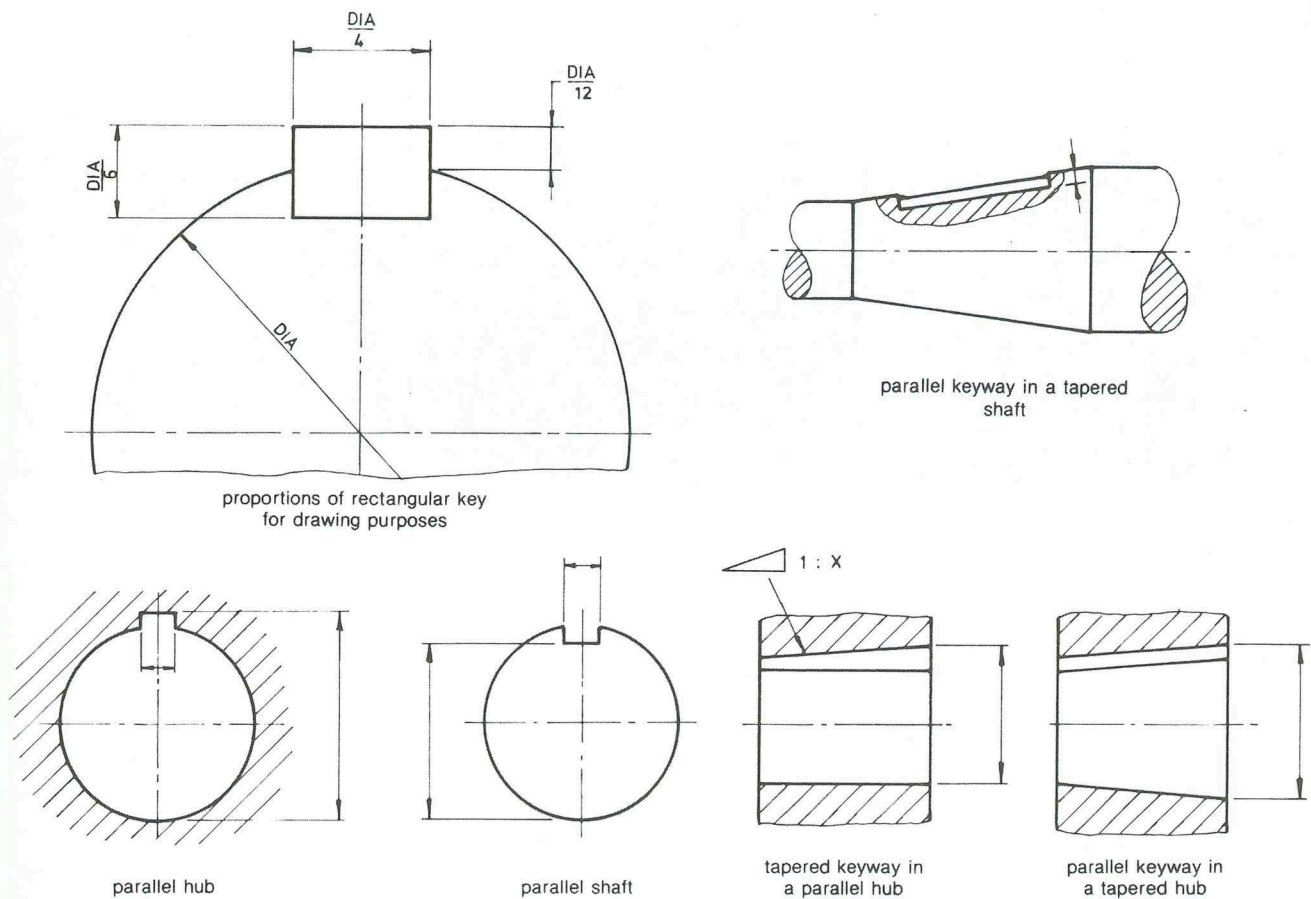
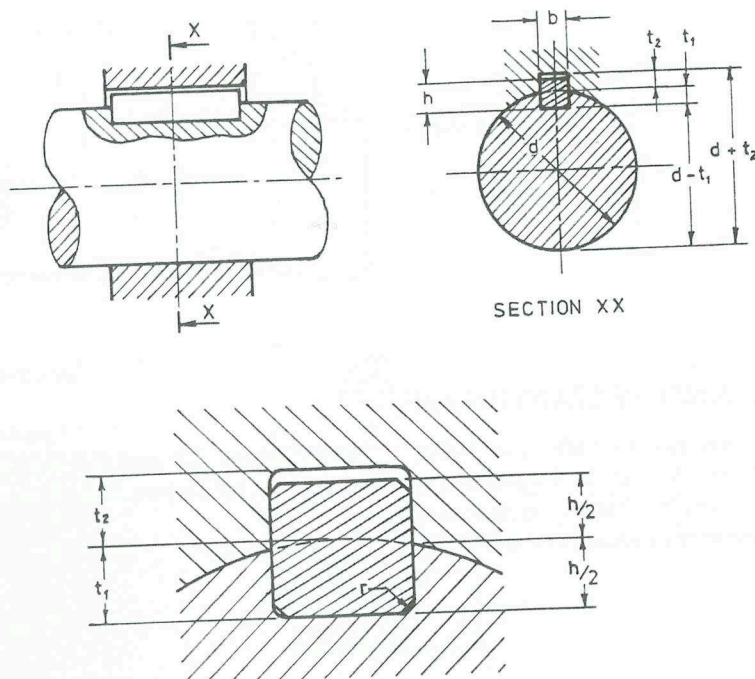


FIGURE 2.20 Enlarged detail of square key and keyways**TABLE 2.2** Dimensions and tolerances for square parallel keyways

As amended July 1974

All dimensions in millimetres

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
SHAFT		KEY (see Note)	KEYWAY											
NOMINAL DIAMETER d (see Note)		SECTION $b \times h$ WIDTH \times THICKNESS	WIDTH b						DEPTH				RADIUS r	
			TOLERANCE FOR CLASS OF FIT						SHAFT t_1		HUB t_2			
OVER	INCL.		NOM.	FREE		NORMAL		CLOSE AND INTERFERENCE	NOM.	TOL.	NOM.	TOL.	MAX.	MIN.
				SHAFT (H9)	HUB (D10)	SHAFT (N9)	HUB (J ₂ 9)*	SHAFT AND HUB (P9)						
6	8	2 x 2	2	+0.025	+0.060	-0.004	+0.012	-0.006	1.2	+0.1 0	1	+0.1 0	0.16	0.08
8	10	3 x 3	3	0	+0.020	-0.029	-0.012	-0.031	1.8		1.4		0.16	0.08
10	12	4 x 4	4						2.5		1.8		0.16	0.08
12	17	5 x 5	5	+0.030 0	+0.078 +0.030	0 -0.030	+0.015 -0.015	-0.012 -0.042	3		2.3		0.25	0.16
17	22	6 x 6	6						3.5		2.8		0.25	0.16

*The limits for tolerance J₂9 are quoted from BS 4500 (ISO limits and fits), to three significant figures.

Note: The relations between shaft diameter and key section given above are for general applications. The use of smaller key sections is permitted if suitable for the torque transmitted. In cases such as stepped shafts when large diameters are required, for example to resist bending, and when fans, gears and impellers are fitted with a smaller key than normal, an unequal disposition of key in shaft with relation to the hub results. Therefore, dimensions $d - t_1$ and $d + t_2$ should be recalculated to maintain the $h/2$ relationship.

The use of larger key sections which are special to any particular application is outside the scope of this standard.

FIGURE 2.21 Enlarged detail of key and keyways

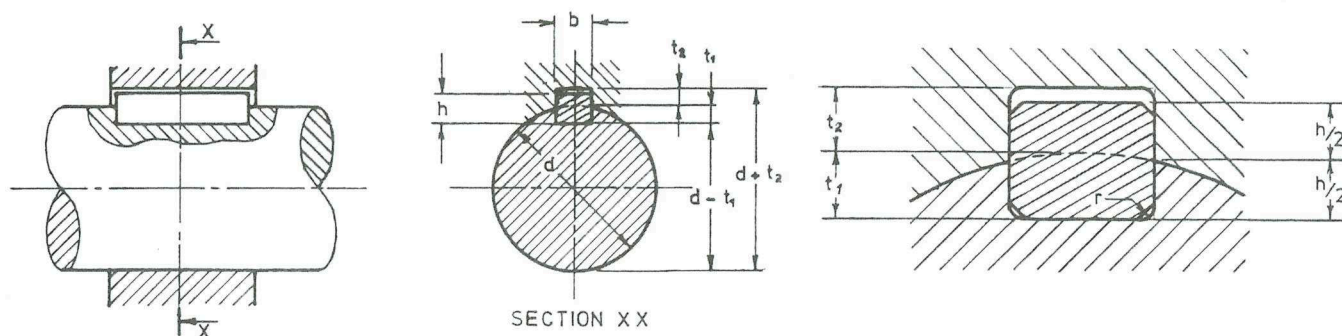


TABLE 2.3 Dimensions and tolerances for rectangular parallel keyways

All dimensions in millimetres

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
SHAFT		KEY (see Note)	KEYWAY											
NOMINAL DIAMETER d (see Note)		SECTION $b \times h$ WIDTH x THICKNESS	WIDTH b						DEPTH				RADIUS r	
			TOLERANCE FOR CLASS OF FIT						SHAFT t_1		HUB t_2			
OVER	INCL.		NOM.	FREE		NORMAL		CLOSE AND INTERFERENCE	NOM.	TOL.	NOM.	TOL.	MAX.	MIN.
				SHAFT (H9)	HUB (D10)	SHAFT (N9)	HUB (J ₂ 9)*	SHAFT AND HUB (P9)						
22	30	8 × 7	8	+0.036	+0.098	0	+0.018	−0.015	4	+0.2 0	3.3	+0.2 0	0.25	0.15
30	38	10 × 8	10	0	+0.040	−0.036	−0.018	−0.051	5		3.3		0.40	0.25
38	44	12 × 8	12	+0.043 0	+0.120 +0.050	0 −0.043	+0.021 −0.021	−0.018 −0.061	5		3.3		0.40	0.25
44	50	14 × 9	14						5.5		3.8		0.40	0.25
50	58	16 × 10	16						6		4.3		0.40	0.25
58	65	18 × 11	18						7	4.4	0.40	0.25		
65	75	20 × 12	20	+0.052 0	+0.149 +0.065	0 −0.052	+0.026 −0.026	−0.022 −0.074	7.5	4.9	0.60	0.40		
75	85	22 × 14	22						9	5.4	0.60	0.40		
85	95	25 × 14	25						9	5.4	0.60	0.40		
95	110	28 × 16	28						10	6.4	0.60	0.40		
110	130	32 × 18	32	+0.062 0	+0.180 +0.080	0 −0.062	+0.031 −0.031	−0.026 −0.088	11	7.4	0.60	0.40		
130	150	36 × 20	36						12	+0.3 0	8.4	+0.3 0	1.00	0.70
150	170	40 × 22	40						13		9.4		1.00	0.70
170	200	45 × 25	45						15		10.4		1.00	0.70
200	230	50 × 28	50						17		11.4		1.00	0.70
230	260	56 × 32	56	+0.074 0	+0.220 +0.100	0 −0.074	+0.037 −0.037	−0.032 −0.106	20	+0.3 0	12.4	+0.3 0	1.60	1.20
260	290	63 × 32	63						20		12.4		1.60	1.20
290	330	70 × 36	70						22		14.4		1.60	1.20
330	380	80 × 40	80						25		15.4		2.50	2.00
380	440	90 × 45	90						+0.087		+0.260		0	+0.043
440	500	100 × 50	100	0	+0.120	−0.087	−0.043	−0.124	31	19.5	2.50	2.00		

*The limits for tolerance $J_2.9$ are quoted from BS 4500 (ISO limits and fits), to three significant figures.

Note: The relations between shaft diameter and key section given above are for general applications. The use of smaller key sections is permitted if suitable for the torque transmitted. In cases such as stepped shafts when large diameters are required, for example to resist bending, and when fans, gears and impellers are fitted with a smaller key than normal, an unequal disposition of key in shaft with relation to the hub results. Therefore, dimensions $d - t_1$ and $d + t_2$ should be recalculated to maintain the $h/2$ relationship.

The use of larger key sections which are special to any particular application is outside the scope of this standard.