

### Trapezoidal and buttress threads

Metric ISO trapezoidal screw threads							cf. DIN 103-1 (1977-04)								
							Nominal diameter $d$ Single start pitch and multiple start lead $P$ Multiple start pitch $P_h$ No. of threads $n = P_h : P$ Minor $\varnothing$ external threads $d_3 = d - (P + 2 \cdot a_c)$ Major $\varnothing$ internal threads $D_4 = d + 2 \cdot a_c$ Minor $\varnothing$ internal threads $D_1 = d - P$ Pitch $\varnothing$ $d_2 = D_2 = d - 0.5 \cdot P$ Thread depth $h_3 = H_3 = 0.5 \cdot P + a_c$ Thread overlap $H_1 = 0.5 \cdot P$ Crest clearance $a_c$ Radius $R_1$ and $R_2$ Width of flat $w = 0.366 \cdot P - 0.54 \cdot a_c$ Thread angle $30^\circ$								
Dimension		For pitch $P$ in mm													
		1.5	2-5	6-12	14-44										
$a_c$		0.15	0.25	0.5	1										
$R_1$		0.075	0.125	0.25	0.5										
$R_2$		0.15	0.25	0.5	1										
Thread dimensions in mm							Thread dimensions in mm								
Thread designation $d \times P$	Pitch $\varnothing$ $d_2 = D_2$	Minor $\varnothing$			Major $\varnothing$ $D_4$	Thread depth $h_3 = H_3$	Width of flat $w$	Thread designation $d \times P$	Pitch $\varnothing$ $d_2 = D_2$	Minor $\varnothing$			Major $\varnothing$ $D_4$	Thread depth $h_3 = H_3$	Width of flat $w$
		ext. th. $d_3$	int. th. $D_1$							ext. th. $d_3$	int. th. $D_1$				
Tr 10 x 2	9	7.5	8	10.5	1.25	0.60	Tr 40 x 7	36.5	32	33	41	4	2.29		
Tr 12 x 3	10.5	8.5	9	12.5	1.75	0.96	Tr 44 x 7	40.5	36	37	45	4	2.29		
Tr 16 x 4	14	11.5	12	16.5	2.25	1.33	Tr 48 x 8	44	39	40	49	4.5	2.66		
Tr 20 x 4	18	15.5	16	20.5	2.25	1.33	Tr 52 x 8	48	43	44	53	4.5	2.66		
Tr 24 x 5	21.5	18.5	19	24.5	2.75	1.70	Tr 60 x 9	55.5	50	51	61	5	3.02		
Tr 28 x 5	25.5	22.5	23	28.5	2.75	1.70	Tr 70 x 10	65	59	60	71	5.5	3.39		
Tr 32 x 6	29	25	26	33	3.5	1.93	Tr 80 x 10	75	69	70	81	5.5	3.39		
Tr 36 x 3	34.5	32.5	33	36.5	2.0	0.83	Tr 90 x 12	84	77	78	91	6.5	4.12		
Tr 36 x 6	33	29	30	37	3.5	1.93	Tr 100 x 12	94	87	88	101	6.5	4.12		
Tr 36 x 10	31	25	26	37	5.5	3.39	Tr 140 x 14	133	124	126	142	8	4.58		
Metric buttress threads							cf. DIN 513 (1985-04)								
							Nominal thread size $d = D$ Pitch $P$ Minor $\varnothing$ external threads $d_3 = d - 1.736 \cdot P$ Minor $\varnothing$ internal threads $D_1 = d - 1.5 \cdot P$ Pitch $\varnothing$ external threads $d_2 = d - 0.75 \cdot P$ Pitch $\varnothing$ internal threads $D_2 = d - 0.75 \cdot P + 3.176 \cdot a$ Axial clearance $a = 0.1 \cdot \sqrt{P}$ External thread depth $h_3 = 0.8678 \cdot P$ Internal thread depth $H_1 = 0.75 \cdot P$ Radius $R = 0.124 \cdot P$ Crest width on major $\varnothing$ $w = 0.264 \cdot P$ Thread angle $33^\circ$								
Thread designation $d \times P$	External threads		Internal threads		Pitch $\varnothing$ $d_2$	Thread designation $d \times P$	External threads		Internal threads		Pitch $\varnothing$ $d_2$				
	Minor $\varnothing$ $d_3$	Thread depth $h_3$	Minor $\varnothing$ $D_1$	Thread depth $H_1$			Minor $\varnothing$ $d_3$	Thread depth $h_3$	Minor $\varnothing$ $D_1$	Thread depth $H_1$					
S 12 x 3	6.79	2.60	7.5	2.25	9.75	S 44 x 7	31.85	6.07	33.5	5.25	38.75				
S 16 x 4	9.06	3.47	10.0	3.00	13.00	S 48 x 8	34.12	6.94	36	6.00	42.00				
S 20 x 4	13.06	3.47	14.0	3.00	17.00	S 52 x 8	38.11	6.94	40	6.00	46.00				
S 24 x 5	15.32	4.34	16.5	3.75	20.25	S 60 x 9	44.38	7.81	46.5	6.75	53.25				
S 28 x 5	19.32	4.34	20.5	3.75	24.25	S 70 x 10	52.64	8.68	55	7.50	62.50				
S 32 x 6	21.58	5.21	23.0	4.50	27.50	S 80 x 10	62.64	8.68	65	7.50	72.50				
S 36 x 6	25.59	5.21	27.0	4.50	31.50	S 90 x 12	69.17	10.41	72	9.00	81.00				
S 40 x 7	27.85	6.07	29.5	5.25	34.75	S 100 x 12	79.17	10.41	82	9.00	91.00				

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