

UDC 621.882.082.4

April 1977

ISO Metric Trapezoidal Screw Thread

Nominal Dimensions

DIN
103
Part 4

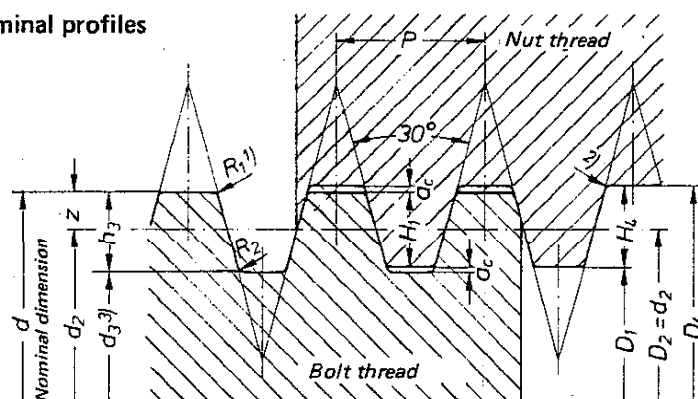
Metrisches ISO-Trapezgewinde; Nennmasse

This Standard conforms essentially with the International Standard ISO 2904-1977 issued by the International Organization for Standardization (ISO).

ISO metric trapezoidal screw threads; Nominal sizes

Dimensions in mm

Nominal profiles



$$\begin{aligned}
 D_1 &= d - 2H_1 = d - P \\
 H_1 &= 0,5P \\
 H_4 &= H_1 + a_c = 0,5P + a_c \\
 h_3 &= H_1 + a_c = 0,5P + a_c \\
 z &= 0,25P = H_1/2 \\
 D_4 &= d + 2a_c \\
 d_3 &= d - 2h_3 \\
 d_2 = D_2 &= d - 2z = d - 0,5P \\
 a_c &= \text{Clearance} \\
 R_1 &= \max. 0,5a_c \\
 R_2 &= \max. a_c
 \end{aligned}$$

Designation of a single-start metric trapezoidal screw thread of $d = 40$ mm nominal diameter with $P = 7$ mm pitch 4):

Tr 40 x 7

Table 1. Dimensions for the thread profiles

P	1,5	2	3	4	5	6	7	8	9	10	12	14	16	18	20	22	24	28	32	36	40	44
a_c	0,15	0,25	0,25	0,25	0,25	0,5	0,5	0,5	0,5	0,5	0,5	1	1	1	1	1	1	1	1	1	1	1
$h_3 - H_4$	0,9	1,25	1,75	2,25	2,75	3,5	4	4,5	5	5,5	6,5	8	9	10	11	12	13	15	17	19	21	23
H_1	0,75	1	1,5	2	2,5	3	3,5	4	4,5	5	6	7	8	9	10	11	12	14	16	18	20	22
$R_1 \max.$	0,075	0,125	0,125	0,125	0,125	0,25	0,25	0,25	0,25	0,25	0,25	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
$R_2 \max.$	0,15	0,25	0,25	0,25	0,25	0,5	0,5	0,5	0,5	0,5	0,5	1	1	1	1	1	1	1	1	1	1	1

- 1) It is recommended to provide a radiusing R_1 or a chamfer on the outside diameter of the bolt thread.
- 2) The maximum allowable edge radiusing on the outside diameter of the nut thread resulting from wear of the new sharp-edged tool at this point shall not exceed the dimension a_c .
- 3) In the case of rolled bolt threads, the profile at the minor diameter may be modified in order to obtain the increased radiusing at the root of the thread which this process requires. The minor diameter of the bolt thread may in this case be made smaller than the nominal diameter d_3 by $0,15 \cdot P$.
- 4) For threads without tolerance indication the medium tolerance quality applies, i.e. tolerance field 7 e for the bolt thread and tolerance field 7 H for the nut thread. If a different tolerance field is required, this is to be stated; in such a case, e.g. for a bolt thread with tolerance field 8 e, the designation reads:

Tr 40 x 7 - 8e

For designation of a multiple-start trapezoidal screw thread see DIN 103 Part 2.

Further standards

- DIN 103 Part 1 ISO metric trapezoidal screw thread; profiles
 DIN 103 Part 2 ISO metric trapezoidal screw thread; general plan
 DIN 103 Part 3 ISO metric trapezoidal screw thread; allowances and tolerances for trapezoidal screw threads of general purpose

Continued on pages 2 to 4

Table 2. Nominal dimensions of thread

Nominal diameter of thread <i>d</i>			Pitch <i>P</i>	Pitch diameter <i>d</i> ₂ = <i>D</i> ₂	Outside diameter <i>D</i> ₄	Minor diameter	
Series 1	Series 2	Series 3				<i>d</i> ₃	<i>D</i> ₁
8			1,5	7,250	8,300	6,200	6,500
	9		1,5 2	8,250 8,000	9,300 9,500	7,200 6,500	7,500 7,000
10			1,5 2	9,250 9,000	10,300 10,500	8,200 7,500	8,500 8,000
	11		2 3	10,000 9,500	11,500 11,500	8,500 7,500	9,000 8,000
12			2 3	11,000 10,500	12,500 12,500	9,500 8,500	10,000 9,000
	14		2 3	13,000 12,500	14,500 14,500	11,500 10,500	12,000 11,000
16			2 4	15,000 14,000	16,500 16,500	13,500 11,500	14,000 12,000
	18		2 4	17,000 16,000	18,500 18,500	15,500 13,500	16,000 14,000
20			2 4	19,000 18,000	20,500 20,500	17,500 15,500	18,000 16,000
	22		3 5 8	20,500 19,500 18,000	22,500 22,500 23,000	18,500 16,500 13,000	19,000 17,000 14,000
24			3 5 8	22,500 21,500 20,000	24,500 24,500 25,000	20,500 18,500 15,000	21,000 19,000 16,000
	26		3 5 8	24,500 23,500 22,000	26,500 26,500 27,000	22,500 20,500 17,000	23,000 21,000 18,000
28			3 5 8	26,500 25,500 24,000	28,500 28,500 29,000	24,500 22,500 19,000	25,000 23,000 20,000
	30		3 6 10	28,500 27,000 25,000	30,500 31,000 31,000	26,500 23,000 19,000	27,000 24,000 20,000
32			3 6 10	30,500 29,000 27,000	32,500 33,000 33,000	28,500 25,000 21,000	29,000 26,000 22,000
	34		3 6 10	32,500 31,000 29,000	34,500 35,000 35,000	30,500 27,000 23,000	31,000 28,000 24,000
36			3 6 10	34,500 33,000 31,000	36,500 37,000 37,000	32,500 29,000 25,000	33,000 30,000 26,000
	38		3 7 10	36,500 34,500 33,000	38,500 39,000 39,000	34,500 30,000 27,000	35,000 31,000 28,000
40			3 7 10	38,500 36,500 35,000	40,500 41,000 41,000	36,500 32,000 29,000	37,000 33,000 30,000
	42		3 7 10	40,500 38,500 37,000	42,500 43,000 43,000	38,500 34,000 31,000	39,000 35,000 32,000
44			3 7 12	42,500 40,500 38,000	44,500 45,000 45,000	40,500 36,000 31,000	41,000 37,000 32,000
	46		3 8 12	44,500 42,000 40,000	46,500 47,000 47,000	42,500 37,000 33,000	43,000 38,000 34,000
48			3 8 12	46,500 44,000 42,000	48,500 49,000 49,000	44,500 39,000 35,000	45,000 40,000 36,000

The nominal diameters of thread should be taken preferably from Series 1 and if necessary from Series 2. The diameters of Series 3 should be avoided for new designs.

Table 2. (continued)

Nominal diameter of thread <i>d</i>			Pitch <i>P</i>	Pitch diameter <i>d</i> ₂ = <i>D</i> ₂	Outside diameter <i>D</i> ₄	Minor diameter <i>d</i> ₃ <i>D</i> ₁	
Series 1	Series 2	Series 3					
	50		3 8 12	48,500 46,000 44,000	50,500 51,000 51,000	46,500 41,000 37,000	47,000 42,000 38,000
52			3 8 12	50,500 48,000 46,000	52,500 53,000 53,000	48,500 43,000 39,000	49,000 44,000 40,000
	55		3 9 14	53,500 50,500 48,000	55,500 56,000 57,000	51,500 45,000 39,000	52,000 46,000 41,000
60			3 9 14	58,500 55,500 53,000	60,500 61,000 62,000	56,500 50,000 44,000	57,000 51,000 46,000
	65		4 10 16	63,000 60,000 57,000	65,500 66,000 67,000	60,500 54,000 47,000	61,000 55,000 49,000
70			4 10 16	68,000 65,000 62,000	70,500 71,000 72,000	65,500 59,000 52,000	66,000 60,000 54,000
	75		4 10 16	73,000 70,000 67,000	75,500 76,000 77,000	70,500 64,000 57,000	71,000 65,000 59,000
80			4 10 16	78,000 75,000 72,000	80,500 81,000 82,000	75,500 69,000 62,000	76,000 70,000 64,000
	85		4 12 18	83,000 79,000 76,000	85,500 86,000 87,000	80,500 72,000 65,000	81,000 73,000 67,000
90			4 12 18	88,000 84,000 81,000	90,500 91,000 92,000	85,500 77,000 70,000	86,000 78,000 72,000
	95		4 12 18	93,000 89,000 86,000	95,500 96,000 97,000	90,500 82,000 75,000	91,000 83,000 77,000
100			4 12 20	98,000 94,000 90,000	100,500 101,000 102,000	95,500 87,000 78,000	96,000 88,000 80,000
		105	4 12 20	103,000 99,000 95,000	105,500 106,000 107,000	100,500 92,000 83,000	101,000 93,000 85,000
	110		4 12 20	108,000 104,000 100,000	110,500 111,000 112,000	105,500 97,000 88,000	106,000 98,000 90,000
		115	6 14 22	112,000 108,000 104,000	116,000 117,000 117,000	108,000 99,000 91,000	109,000 101,000 93,000
120			6 14 22	117,000 113,000 109,000	121,000 122,000 122,000	113,000 104,000 96,000	114,000 106,000 98,000
		125	6 14 22	122,000 118,000 114,000	126,000 127,000 127,000	118,000 109,000 101,000	119,000 111,000 103,000
	130		6 14 22	127,000 123,000 119,000	131,000 132,000 132,000	123,000 114,000 106,000	124,000 116,000 108,000
		135	6 14 24	132,000 128,000 123,000	136,000 137,000 137,000	128,000 119,000 109,000	129,000 121,000 111,000
140			6 14 24	137,000 133,000 128,000	141,000 142,000 142,000	133,000 124,000 114,000	134,000 126,000 116,000
		145	6 14 24	142,000 138,000 133,000	146,000 147,000 147,000	138,000 129,000 119,000	139,000 131,000 121,000

Table 2. (continued)

Nominal diameter of thread <i>d</i>			Pitch <i>P</i>	Pitch diameter <i>d</i> ₂ = <i>D</i> ₂	Outside diameter <i>D</i> ₄	Minor diameter <i>d</i> ₃ <i>D</i> ₁	
Series 1	Series 2	Series 3					
	50		3	48,500	50,500	46,500	47,000
			8	46,000	51,000	41,000	42,000
			12	44,000	51,000	37,000	38,000
52			3	50,500	52,500	48,500	49,000
			8	48,000	53,000	43,000	44,000
			12	46,000	53,000	39,000	40,000
	55		3	53,500	55,500	51,500	52,000
			9	50,500	56,000	45,000	46,000
			14	48,000	57,000	39,000	41,000
60			3	58,500	60,500	56,500	57,000
			9	55,500	61,000	50,000	51,000
			14	53,000	62,000	44,000	46,000
	65		4	63,000	65,500	60,500	61,000
			10	60,000	66,000	54,000	55,000
			16	57,000	67,000	47,000	49,000
70			4	68,000	70,500	65,500	66,000
			10	65,000	71,000	59,000	60,000
			16	62,000	72,000	52,000	54,000
	75		4	73,000	75,500	70,500	71,000
			10	70,000	76,000	64,000	65,000
			16	67,000	77,000	57,000	59,000
80			4	78,000	80,500	75,500	76,000
			10	75,000	81,000	69,000	70,000
			16	72,000	82,000	62,000	64,000
	85		4	83,000	85,500	80,500	81,000
			12	79,000	86,000	72,000	73,000
			18	76,000	87,000	65,000	67,000
90			4	88,000	90,500	85,500	86,000
			12	84,000	91,000	77,000	78,000
			18	81,000	92,000	70,000	72,000
	95		4	93,000	95,500	90,500	91,000
			12	89,000	96,000	82,000	83,000
			18	86,000	97,000	75,000	77,000
100			4	98,000	100,500	95,500	96,000
			12	94,000	101,000	87,000	88,000
			20	90,000	102,000	78,000	80,000
		105	4	103,000	105,500	100,500	101,000
			12	99,000	106,000	92,000	93,000
			20	95,000	107,000	83,000	85,000
	110		4	108,000	110,500	105,500	106,000
			12	104,000	111,000	97,000	98,000
			20	100,000	112,000	88,000	90,000
		115	6	112,000	116,000	108,000	109,000
			14	108,000	117,000	99,000	101,000
			22	104,000	117,000	91,000	93,000
120			6	117,000	121,000	113,000	114,000
			14	113,000	122,000	104,000	106,000
			22	109,000	122,000	96,000	98,000
		125	6	122,000	126,000	118,000	119,000
			14	118,000	127,000	109,000	111,000
			22	114,000	127,000	101,000	103,000
	130		6	127,000	131,000	123,000	124,000
			14	123,000	132,000	114,000	116,000
			22	119,000	132,000	106,000	108,000
		135	6	132,000	136,000	128,000	129,000
			14	128,000	137,000	119,000	121,000
			24	123,000	137,000	109,000	111,000
140			6	137,000	141,000	133,000	134,000
			14	133,000	142,000	124,000	126,000
			24	128,000	142,000	114,000	116,000
		145	6	142,000	146,000	138,000	139,000
			14	138,000	147,000	129,000	131,000
			24	133,000	147,000	119,000	121,000