
Steel wire rod — Dimensions and tolerances

Fil machine en acier — Dimensions et tolérances

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Contents

	Page
Foreword	iv
1 Scope	1
2 Dimensions and tolerances on dimensions	1
2.1 Round wire rod	1
2.2 Square wire rod	4
2.3 Hexagonal wire rod	5
2.4 Rectangular wire rod	7
3 Inspection on the cross-sectional dimensions	9
4 Mass of coils	9
Bibliography	10

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 17, *Steel*, Subcommittee SC 17, *Steel wire rod and wire products*.

This second edition cancels and replaces the first edition (ISO 16124:2004), which has been technically revised.

Steel wire rod — Dimensions and tolerances

1 Scope

This International Standard specifies dimensions and tolerances to the dimensions applicable to steel wire rod as defined in ISO 6929.

2 Dimensions and tolerances on dimensions

The dimensions and tolerances applicable to the dimensions of hot-rolled steel wire rod shall be as specified in 2.1 to 2.4.

2.1 Round wire rod

The preferred nominal sizes and tolerances on diameters shall be as specified in Table 1 and Table 2, respectively. Four levels of tolerance are standardized: T1, T2, T3 and T4.

The maximum permissible out-of-round for all sizes, measured as the difference between the maximum and the minimum diameter of the same cross-section, shall be 80 % of the total tolerance specified on the diameter (see Table 2).

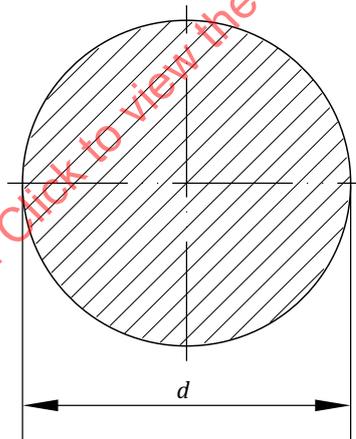


Table 1 — Preferred diameter, nominal section, and nominal mass of round wire rod

Preferred diameter, d mm	Cross-sectional area ^a mm ²	Mass per unit length ^a kg/m
5	19,63	0,154
5,5	23,76	0,187
6	28,27	0,222
6,5	33,18	0,260
7	38,48	0,302
7,5	44,18	0,347
8	50,26	0,395

^a For information only.

NOTE 1 Cross-sectional area: $S = 0,7854d^2$

NOTE 2 Mass/m = 0,00785S.

Table 1 (continued)

Preferred diameter, d mm	Cross-sectional area ^a mm ²	Mass per unit length ^a kg/m
8,5	56,74	0,445
9	63,62	0,499
9,5	70,88	0,556
10	78,54	0,617
10,5	86,59	0,680
11	95,03	0,746
11,5	103,9	0,816
12	113,1	0,888
12,5	122,7	0,963
13	132,7	1,04
13,5	143,1	1,12
14	153,9	1,21
14,5	165,1	1,30
15	176,7	1,39
15,5	188,7	1,48
16	201,1	1,58
16,5	213,8	1,68
17	227,0	1,78
17,5	240,5	1,89
18	254,5	2,00
18,5	268,8	2,11
19	283,5	2,23
19,5	298,6	2,34
20	314,2	2,47
21	346,4	2,72
22	380,1	2,98
23	415,5	3,26
24	452,4	3,55
25	490,9	3,85
26	530,9	4,17
27	572,6	4,49
28	615,8	4,83
29	660,5	5,18
30	706,9	5,55
31	754,8	5,92
32	804,2	6,31
33	855,3	6,71

^a For information only.

NOTE 1 Cross-sectional area: $S = 0,7854d^2$

NOTE 2 Mass/m = 0,00785S.

Table 1 (continued)

Preferred diameter, d mm	Cross-sectional area ^a mm ²	Mass per unit length ^a kg/m
34	907,9	7,13
35	962,1	7,55
36	1 018	7,99
37	1 075	8,44
38	1 134	8,90
39	1 195	9,38
40	1 257	9,86
41	1 320	10,4
42	1 385	10,9
43	1 452	11,4
44	1 521	11,9
45	1 590	12,5
46	1 662	13,0
47	1 735	13,6
48	1 810	14,2
49	1 886	14,8
50	1 964	15,4
51	2 043	16,0
52	2 124	16,7
53	2 206	17,3
54	2 290	18,0
55	2 376	18,7
56	2 463	19,3
57	2 552	20,0
58	2 642	20,7
59	2 734	21,5
60	2 827	22,2

^a For information only.
NOTE 1 Cross-sectional area: $S = 0,7854d^2$
NOTE 2 Mass/m = 0,00785S.

Table 2 — Tolerances on diameter of round wire rod and out-of-round of round wire rod

Diameter, d mm	Tolerance ^b mm				Out-of-round (\leq) mm			
	T1 ^a	T2	T3	T4	T1	T2	T3	T4
$5,00 \leq d \leq 10,00$	$\pm 0,30$	$\pm 0,25$	$\pm 0,20$	$\pm 0,15$	0,48	0,40	0,32	0,24
$10,00 < d \leq 15,00$	$\pm 0,40$	$\pm 0,30$	$\pm 0,25$	$\pm 0,20$	0,64	0,48	0,40	0,32

^a For the size range $5,00 \text{ mm} < d \leq 10,00 \text{ mm}$, larger values for the tolerance may be agreed upon between the parties.
^b For other strict class tolerances, tolerance may be agreed upon between the parties.

Table 2 (continued)

Diameter, d mm	Tolerance ^b mm				Out-of-round (\leq) mm			
	T1 ^a	T2	T3	T4	T1	T2	T3	T4
15,00 < d ≤ 25,00	±0,50	±0,35	±0,30	±0,25	0,80	0,56	0,48	0,40
25,00 < d ≤ 40,00	±0,60	±0,40	±0,35	±0,30	0,96	0,64	0,56	0,48
40,00 < d ≤ 50,00	±0,80	±0,50	±0,40	-	1,28	0,80	0,64	-
50,00 < d ≤ 60,00	±1,00	±0,60	-	-	1,60	0,96	-	-

^a For the size range 5,00 mm < d ≤ 10,00 mm, larger values for the tolerance may be agreed upon between the parties.
^b For other strict class tolerances, tolerance may be agreed upon between the parties.

2.2 Square wire rod

The nominal width and tolerance of the side shall be as specified in Table 3 and Table 4, respectively.

The permissible out-of-square for all sizes, measured as the difference between the maximum and the minimum diameter of the same cross-section, shall be 80 % of the total tolerance specified on the width of side (see Table 4).

The tolerances on corner radius of nominal width of square wire rod shall be as specified in Table 5.

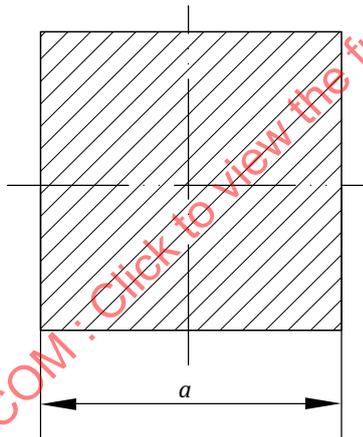


Table 3 — Width of side, nominal section, and nominal mass of square wire rod

Preferred width, a mm	Cross-sectional area ^a mm ²	Mass per unit length ^a kg/m
8	64,00	0,50
9	81,00	0,64
10	100,0	0,79
11	121,0	0,95
12	144,0	1,13
13	169,0	1,33
14	196,0	1,54
15	225,0	1,77
16	256,0	2,01
17	289,0	2,27
18	324,0	2,54

^a For information only.

Table 3 (continued)

Preferred width, a mm	Cross-sectional area ^a mm ²	Mass per unit length ^a kg/m
19	361,0	2,83
20	400,0	3,14
21	441,0	3,46
22	484,0	3,80
23	529,0	4,15
24	576,0	4,52
25	625,0	4,91
26	676,0	5,31
27	729,0	5,72
28	784,0	6,15
29	841,0	6,60
30	900,0	7,06
31	961,0	7,54
32	1 024,0	8,04

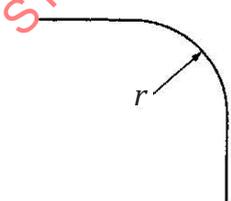
^a For information only.

Table 4 — Width tolerances and out-of-square of square wire rod

Nominal width, a mm		Width tolerance mm	Out-of-square (\leq) mm
Over	Up to and including		
8,5	15	$\pm 0,4$	0,64
15	25	$\pm 0,5$	0,80
25	32	$\pm 0,6$	0,96

NOTE Limited corner radii are permissible.

Table 5 — Tolerances on corner radius of nominal width of square wire rod

Corner radius, r	Nominal width, mm	r , mm
	$8 \leq a \leq 12$	$r \leq 1$
	$12 < a \leq 20$	$r \leq 1,5$
	$20 < a \leq 30$	$r \leq 2$
	$30 < a \leq 32$	$r \leq 2,5$

2.3 Hexagonal wire rod

The nominal thickness, measured as the width across opposite flat faces, and tolerance on thickness shall be as specified in [Table 6](#) and [Table 7](#), respectively.

The permissible out-of-hexagon for all sizes measured as the difference between the maximum and the minimum diameter of the same cross-section, shall be 80 % of the total thickness tolerance (see [Table 7](#)).

The tolerances on corner radius of nominal width of hexagonal wire rod shall be as specified in [Table 8](#).

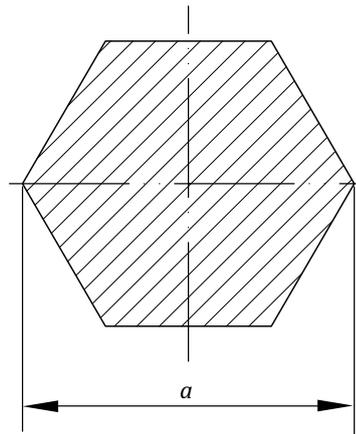


Table 6 — Thickness, nominal section, and nominal mass of hexagonal wire rod

Preferred thickness, a mm	Cross-sectional area ^a mm ²	Mass per unit length ^a kg/m
15	194,9	1,53
16	221,7	1,74
17	250,3	1,96
18	280,6	2,20
19	312,6	2,45
20	346,4	2,72
22	419,2	3,29
23	458,1	3,60
24	498,8	3,92
25	541,3	4,25
26	585,4	4,60
27	631,3	4,96
28	679,0	5,33
29	728,3	6,37
30	779,4	6,81
31	832,2	7,28
32	886,8	7,76
33	943,1	8,25
34	1 000,1	8,76
35	1 060,8	9,28
36	1 122,3	9,82
37	1 185,5	10,37
38	1 250,5	10,94
39	1 317,2	11,52
40	1 385,6	12,12

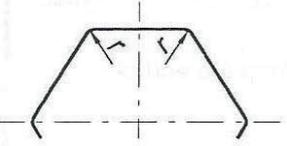
^a For information only.

Table 7 — Thickness tolerances and out-of-hexagon of hexagonal wire rod

Nominal thickness, a mm		Thickness tolerance mm	Out-of-hexagon (\leq) mm
Over	Up to and including		
8,5	15	$\pm 0,4$	0,64
15	25	$\pm 0,5$	0,80
25	40	$\pm 0,6$	0,96

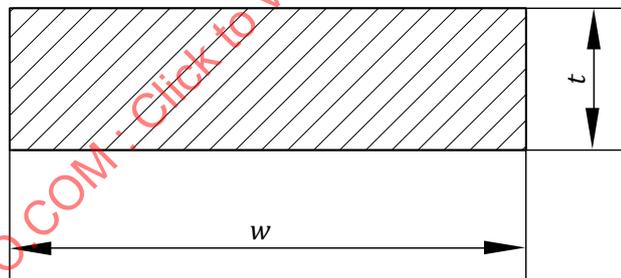
NOTE Limited corner radii are permissible.

Table 8 — Tolerances on corner radius of nominal width of hexagon wire rod

Corner radius, r	Nominal width, mm	r , mm
	$a \leq 20,0$	$r \leq 1,5$
	$20,0 < a \leq 28,5$	$r \leq 2,0$
	$28,5 < a \leq 40$	$r \leq 2,5$

2.4 Rectangular wire rod

The nominal size, defined as width (w) by thickness (t), and tolerance on size shall be as specified in [Table 9](#), [Table 10a](#), and [Table 10b](#), respectively.

**Table 9 — Size, nominal section, and nominal mass of rectangular wire rod**

Preferred $w \times t$ mm	Cross-sectional area ^a mm ²	Mass per unit length ^a kg/m
18 × 10	180,0	1,41
18 × 12	216,0	1,70
20 × 10	200,0	1,57
20 × 12	240,0	1,88
20 × 14	280,0	2,20
22 × 8	176,0	1,38
22 × 10	220,0	1,73
22 × 12	264,0	2,07
22 × 14	308,0	2,42

^a For information only.

NOTE By agreement between purchaser and manufacturer, other sizes may be delivered.

Table 9 (continued)

Preferred $w \times t$ mm	Cross-sectional area ^a mm ²	Mass per unit length ^a kg/m
25 × 8	200,0	1,57
25 × 10	250,0	1,96
25 × 12	300,0	2,36
25 × 14	350,0	2,75
25 × 16	400,0	3,14
28 × 8	224,0	1,76
28 × 10	280,0	2,20
28 × 12	336,0	2,64
28 × 14	392,0	3,08
28 × 16	448,0	3,52
30 × 6	180,0	1,41
30 × 8	240,0	1,88
30 × 10	300,0	2,36
30 × 12	360,0	2,83
30 × 14	420,0	3,30
30 × 16	480,0	3,77

^a For information only.

NOTE By agreement between purchaser and manufacturer, other sizes may be delivered.

Table 10a — Width tolerances of rectangular wire rod

Nominal width, w mm		Width tolerance mm
Over	Up to and including	
18	22	±0,4
22	28	±0,5
28	30	±0,6

NOTE Limited corner radii are permissible.

Table 10b — Thickness tolerances of rectangular wire rod

Nominal thickness, t mm		Thickness tolerance mm
Over	Up to and including	
8	12	±0,3
12	16	±0,4

NOTE Limited corner radii are permissible.