

UDC 669.14-426

December 1962

Steel Wire Rod

Dimensions Permissible Variations Weights

DIN
59110

Walzdraht aus Stahl; Maße, Zulässige Abweichungen, Gewichte

This Standard shows agreement with Euronorm 17 - Wire Rod produced from Unalloyed Steel for Drawing and Cold Rolling, Dimensions and Permissible Variations - issued by the High Authority of the European Coal and Steel Community¹⁾.

Dimensions in mm

1. Definition

Wire rod is a product which is random coiled in the hot state straight from rolling.

2. Scope

2.1. This Standard applies to round, square, hexagon, half-round and flat wire rod in all grades of steel except where covered by special dimension standards.

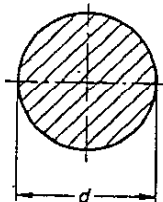
2.2. This Standard does not deal with wire rod for bolts, nuts and rivets; a standard for this purpose is in course of preparation.

3. Dimensions

3.1. A Round wire rod

Designation of round wire rod (A) of diameter $d = 5$ mm in wire rod grade D 9-1 according to DIN 17140:

Round A 5 DIN 59110-D 9-1
or Rd A 5 DIN 59110-D 9-1



Diameter		Cross-sectional area F ²⁾ mm ²	Weight per unit length (7,85 kg/dm ³) kg/m
d	Permissible variation		
5	± 0,3	19,6	0,154
5,5		23,8	0,187
6		28,3	0,222
6,5		33,2	0,260
7	± 0,4	38,5	0,302
7,5		44,2	0,347
8		50,3	0,395
8,5		56,7	0,445
9		63,6	0,499
9,5		70,9	0,556
10		78,5	0,617
10,5		86,6	0,680
11		95,0	0,746
11,5		104	0,815
12		113	0,888
12,5		123	0,963
13		133	1,04
13,5		143	1,12
14		154	1,21
14,5		165	1,30
15		177	1,39

Diameter		Cross-sectional area F ²⁾ mm ²	Weight per unit length (7,85 kg/dm ³) kg/m
d	Permissible variation		
15,5	± 0,5	189	1,48
16		201	1,58
16,5		214	1,68
17		227	1,78
17,5		241	1,89
18		254	2,00
18,5		269	2,11
19		284	2,23
19,5		299	2,34
20		314	2,47
20,5		330	2,59
21		346	2,72
21,5		363	2,85
22		380	2,98
22,5		398	3,12
23		415	3,26
23,5		434	3,40
24	± 0,6	452	3,55
24,5		471	3,70
25		491	3,85
25,5		511	4,01
26		531	4,17
26,5		552	4,33
27		573	4,49
27,5		594	4,66
28		616	4,83
28,5		638	5,01
29		661	5,19
29,5		683	5,38
30		707	5,55

1) Obtainable from Beuth Verlag GmbH, Berlin 30

2) Cross-sectional area $F = \frac{d^2 \pi}{4} \approx 0.785 d^2$

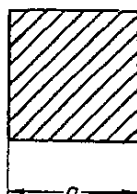
The permissible out-of roundness, that is to say the difference between the largest and the smallest diameter as measured over one and the same cross-section, shall not exceed 80 % of the permissible total variation on diameter.

Continued on pages 2 and 3

3.2. B Square wire rod

Designation of square wire rod (B) of length of side $a = 8$ mm in wire rod grade D 12-2 according to DIN 17140:

Square B 8 DIN 59110-D 12-2
or 4kt B 8 DIN 59110-D 12-2



Length of side a	Perm. differ. betw. largest and smallest length of side over one and the same cross-section	Cross-sectional area mm ²	Weight per unit length (7,85 kg/dm ³) kg/m
5	± 0,3	25,0	0,196
5,5		30,2	0,237
6		36,0	0,283
7	± 0,4	49,0	0,385
8		64,0	0,502
9		81,0	0,636
10		100	0,785

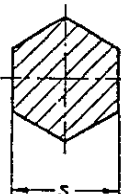
Length of side a	Perm. differ. betw. largest and smallest length of side over one and the same cross-section	Cross-sectional area F mm ²	Weight per unit length (7,85 kg/dm ³) kg/m
(11) ^{*)}	± 0,4	121	0,950
12		144	1,13
13		169	1,33
14		196	1,54
15		225	1,77
16	± 0,5	256	2,01
17		289	2,27
18		324	2,54
19		361	2,83
20		400	3,14
21		441	3,46
21,5		462	3,63
22		484	3,80
23		529	4,15
24		576	4,52
25		625	4,91
26	± 0,6	676	5,31
26,5		702	5,51
28		784	6,15
29		841	6,60
30		900	7,07

^{*)} This size should be avoided where possible; it is due for deletion from the next issue of the Standard.

3.3. C Hexagon wire rod

Designation of hexagon wire rod (C) of width across flats $s = 10$ mm in free-cutting steel 9 S 20 according to DIN 1651:

Hexagon C 10 DIN 59110-9 S 20
or 6kt C 10 DIN 59110-9 S 20



Width across flats s	Perm. differ. betw. largest and smallest width across flats over one and the same cross-section	Cross-sectional area F ³⁾ mm ²	Weight per unit length (7,85 kg/dm ³) kg/m
6	± 0,4	31,2	0,245
7		42,4	0,333
8		55,4	0,435
9		70,1	0,551
10		86,6	0,680
11		105	0,823
12		125	0,978
13		146	1,15
14		170	1,33
15		195	1,53
16	± 0,5	222	1,74
17		250	1,96
18		281	2,20
19		313	2,45
20		346	2,72
22		419	3,29
23		458	3,60
24		499	3,92
25		541	4,25
27	± 0,6	631	4,96
28		679	5,33

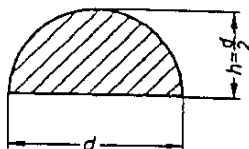
³⁾ Cross-sectional area

$$F = \frac{1}{2} \sqrt{3} \cdot s^2 \approx 0,866 s^2$$

3.4. D Half-round wire rod

Designation of half-round wire rod (D) of diameter $d = 8$ mm in wire rod grade D 20-2 according to DIN 17140:

Half-round D 8 DIN 59110-D 20-2
or Hrd D 8 DIN 59110-D 20-2



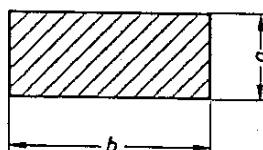
Diameter d	Permissible variation	Permissible variation for $h = \frac{d}{2}$	Cross-sectional area $F^4)$ mm ²	Weight per unit length (7,85 kg/dm ³) kg/m
7			19,2	0,156
8	$\pm 0,4$	$\pm 0,25$	25,1	0,197
9			31,8	0,250
10			39,2	0,308
11	$\pm 0,5$	$\pm 0,25$	47,5	0,373
12			56,5	0,444
13			66,3	0,521
14			76,9	0,605
15	$\pm 0,6$	$\pm 0,3$	88,3	0,695
16			101	0,790

⁴⁾ Cross-sectional area $F = \frac{d^2 \pi}{8} \approx 0.3925 d^2$

3.5. E Flat wire rod

Designation of flat wire rod (E) of thickness $a = 5.5$ mm and width $b = 30$ mm in wire rod grade D 35-2 according to DIN 17140:

Flat E 5.5 x 30 DIN 59110-D 35-2
or Fl E 5.5 x 30 DIN 59110-D 35-2



Width b		Thickness a	
minimum	Permissible variation		Permissible variation
8	$\pm 0,6$	1,8 to $(b-1)$	$\pm 0,3$

4. Material

The wire rod grade shall be stated when ordering.

5. Testing

Any re-testing of accuracy to size shall be carried out at not less than 5 m from the ends of a coil in the case of wire rod having a nominal size up to 7 mm or equivalent cross-sectional area, and not less than 4 m from the ends in the case of wire rod of nominal size exceeding 7 mm or equivalent cross-sectional area.

6. Form in which delivered

6.1. The wire rod is supplied in coils which must unwind from the top downwards in the counter-clockwise direction.

6.2. Coil weights and sizes can be agreed when ordering. Individual coils are supplied subject to a permissible weight variation of +5 % to -15 % (referenced to the ordered weight). Not more than 6 % of the coils, or a minimum of two coils, may be supplied with weight variations exceeding these limits.

Examples of orders

100 t Round wire rod A of diameter $d = 5$ mm in wire rod grade D 9-1 according to DIN 17140 in coils of 200 kg:

100 t Round A 5 DIN 59110-D 9-1 in coils of 200 kg
or 100 t Rd A 5 DIN 59110-D 9-1 in coils of 200 kg

50 t Flat wire rod E of thickness $a = 5.5$ mm and width $b = 30$ mm in wire rod grade D 12-2 in coils of 300 kg:

50 t Flat E 5.5 x 30 DIN 59110-D 12-2 in coils of 300 kg
or 50 t Fl E 5.5 x 30 DIN 59110-D 12-2 in coils of 300 kg