UDC 669.14-426 : 621.88

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Steel Wire Rod for Bolts, Nuts and Rivets

Dimensions, Permissible Variations, Weights

DIN 59115

Walzdraht aus Stahl für Schrauben, Muttern und Niete; Maße, zulässige Abweichungen, Gewichte

For connection with Euronorm 108 issued by the European Coal and Steel Community, see Explanations.

Dimensions in mm

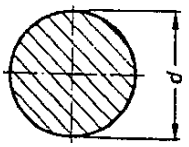
1. Scope

This Standard applies to round wire rod with a nominal diameter from 5.5 to 30 mm which is made in the steels mentioned in Section 5 and is intended for the manufacture of bolts, nuts and rivets.

2. Definition

Wire rod is a product of any cross-sectional form which is wound in random-layer coils in the hot condition direct from rolling.

3. Designation



Designation of round wire rod of diameter d = 12.5 mm with Grade A dimension accuracy in steel denoted by the code number UQSt 36-2 or material number 1.0204:

Wire 12.5 A DIN 59115 - UQSt 36-2
or Wire 12.5 A DIN 59115 - 1.0204

The denomination "wire" (Draht) may be replaced by the abbreviated form "Dr" according to DIN 1353.

4. Dimensions and permissible variations

4.1. The Table shows the preferred diameters and permissible variations in which steel wire rod for the manufacture of bolts, nuts and rivets is supplied. The desired dimension accuracy (A or B) should be stated in the designation.

4.2. Out-of-roundness, that is to say the difference between the largest and smallest diameter as measured in a single cross-section plane, must not exceed 80 % of the permissible overall diameter variation according to the Table.

5. Material

Wire rod according to this Standard is made mainly in the steels according to DIN 1654 and DIN 17111. The grade of steel required should be stated in the designation.

6. Mode of delivery

6.1. Wire rod according to this Standard is supplied in coils on a weight basis.

6.2. Coil weight and dimensions are to be agreed.

6.3. The coils are supplied in weights differing by not more than +5 to -15 % from the agreed coil weight. Coils having a total weight of not more than 6 % of the quantity ordered, and in any case at least two coils, may exhibit weight variations up to -60 %. If the agreed coil weight is less than 200 kg, weight variations up to -50 % are allowed for a maximum of 3 % of the ordered quantity only, and in any case for at least two coils.

6.4. The coils must be wound in the clockwise direction, durably tied at several points and adequately marked.

6.5. Example of order

20 t wire rod of diameter d = 12.5 mm in coils weighing 300 kg with Grade A dimension accuracy according to DIN 59115 in steel having the code number UQSt 36-2 or material number 1.0204:

20 t wire 12.5 A DIN 59115 - UQSt 36-2 in coils of 300 kg
or 20 t Dr 12.5 A DIN 59115 - 1.0204 in coils of 300 kg

7. Checking dimension accuracy

Dimensions may be checked at any point on the coils. In cases of arbitration the check should be made at a distance of not less than 300 mm from the ends of the coil.

Other relevant standards

DIN 59110 Steel wire rod
DIN 59130 Hot rolled round steel bars for bolts and rivets

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Nominal diameter, permissible variations, cross-section and weight of the steel wire rod for bolts, nuts and rivets.

Nominal dimension d	Diameter Permissible variations for dimension accuracy A	B	Cross-section [1] ≈ mm²	Weight [2] kg/m
5,5	± 0,20	± 0,15	23,8	0,187
6			28,3	0,222
6,5			33,2	0,260
7			38,5	0,302
7,5			44,2	0,347
7,8			47,8	0,375
8			50,3	0,395
8,25			53,5	0,420
8,5			56,7	0,445
8,75			60,1	0,472
9			63,6	0,499
9,5			70,9	0,556
9,75			74,7	0,586
10			78,5	0,617
10,5	± 0,25	± 0,20	86,6	0,680
11			95,0	0,746
11,5			104	0,815
11,75			108	0,851
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
15,5			189	1,48
16	± 0,30	± 0,25	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	± 0,35	± 0,30	380	2,98
22,5			398	3,12
23			415	3,26
24			452	3,55
24,5			471	3,70
25			491	3,85
26			531	4,17
26,5			552	4,33
27			573	4,49
28			616	4,83
29			661	5,19
30			707	5,55

[1] Cross-section ≈ 0.785 . d^2
[2] Calculated on the basis of a density of 7.85 kg/dm³

Explanations

This new Issue of DIN 59115 takes account of the results of discussions with the German manufacturing, processing and user organizations concerned, which dealt at the same time with the first version of Euronorm 108 - Round steel wire rod for cold-formed bolts; dimensions and permissible variations (at present still in the form of the February 1972 draft), and with the new version of the dimension specifications for round steel rod for bolts and rivets (DIN 59130, Issue of October 1971). In the course of these discussions considerable progress was achieved in standardizing and rationalizing the diameter series of the above-mentioned primary products intended for bolt and rivet manufacture.

From the earlier version of DIN 59115 dated February 1968, 18 nominal diameters (5.0 - 9.25 - 10.2 - 10.65 - 11.2 - 12.2 - 12.7 - 13.2 - 13.75 - 14.1 - 15.2 - 15.7 - 16.2 - 17.4 - 18.8 - 19.4 - 21.3 - and 22.3 mm) have been deleted. The present diameter series agrees almost completely with the provisions of Euronorm 108. It now contains only five special dimensions (7.8 - 8.25 - 8.75 - 9.75 - and 11.75 mm) which are not envisaged for wire rod for general use (according to DIN 59110). Continued provision for these diameters is necessary because of the existing internationally unified specifications for bolt dimensions.

With regard to the permissible diameter variations it has not been possible to achieve complete alignment with the international specifications. For Grade A the Euronorm contains higher values than those already previously laid down in DIN 59115. In response to the wishes of German bolt manufacturers and in agreement with the wire rod manufacturers, therefore, the variations in the new Issue of the DIN standard have been lowered by 0.05 mm each time compared with the Euronorm. Overall this has also resulted in the case of Grade A - which accounts by far for the largest part of orders and deliveries - in an improvement compared with the February 1968 Issue of DIN 59115. For Grade B the permissible variations have been taken over from the Euronorm except for the diameter range up to 10 mm where the values in the DIN standard are lower by 0.05 mm. In the case of the larger diameters alignment with the international specifications has resulted in some cases in a raising of the permissible variations. In return, however, the increased accuracy can now be ordered for all coil weights, since the earlier restriction to weights up to 200 kg has been dropped.