UDC 669.14-422.6-122.4

November 1972

Steel Bars
Hot Rolled Hexagon Steel
Dimensions, Weights, Permissible Variations

DIN 1015

Stabstahl; Warmgewalzter Sechskantstahl;
Maße, Gewichte, zulässige Abweichungen

For connection with Euronorm 61-71 issued by the European Coal and Steel Community, see Explanations.

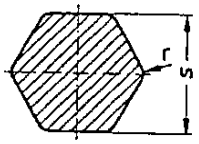
Dimensions in mm

1. Scope

This Standard applies to hot rolled hexagon steel in the width across flats of 13 to 103 mm supplied as straight bars in the steel grades stated in Section 4.

This Standard does not cover round wire rod (see DIN 59110).

2. Designation



Designation of hot rolled hexagon steel of width across flats s = 18 mm in a free cutting steel covered by the code number 9 SMn 28 or by the material number 1.0715 according to DIN 1651:

Hexagon 18 DIN 1015 - 9 SMn 28

or Hexagon 18 DIN 1015 - 1.0715

The denomination "hexagon" may be replaced by the abridged form "6kt" according to DIN 1353.

3. Dimensions and permissible dimension and form variations

3.1. Cross-section

3.1.1. The widths across flats in which hot rolled hexagon steel is preferentially supplied, and the permissible variations on these widths across flats are contained in Table 1.

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Table 1.

Width across flats s		Cross-section[2] A	Weight G	Surface area U
Nominal dimension[1]	perm. var.	cm²	kg/m	cm²/m
(13)	± 0,4	1,46	1,15	450
(14)	± 0,4	1,70	1,33	486
15	± 0,4	1,95	1,53	520
(16)	± 0,5	2,22	1,74	554
(17)	± 0,5	2,50	1,96	589
18	± 0,5	2,81	2,20	624
20,5	± 0,5	3,64	2,86	710
22,5	± 0,5	4,38	3,44	780
23,5	± 0,5	4,78	3,75	815
25,5	± 0,6	5,63	4,42	884
28,5	± 0,6	7,03	5,52	997
31,5	± 0,6	8,59	6,75	1090
33,5	± 0,6	9,72	7,63	1160
37,5	± 0,8	12,2	9,56	1300

Width across flats s		Cross-section[2] A	Weight G	Surface area U
Nominal dimension[1]	perm. var.	cm²	kg/m	cm²/m
(39,5)	± 0,8	13,5	10,6	1370
42,5	± 0,8	15,6	12,3	1470
47,5	± 0,8	19,5	15,3	1650
52	± 1,0	23,4	18,4	1800
57	± 1,0	28,1	22,1	1970
(62)	± 1,0	33,3	26,1	2150
(67)	± 1,0	38,9	30,5	2320
(72)	± 1,0	44,9	35,2	2490
(78)	± 1,0	52,7	41,4	2700
(83)	± 1,0	59,7	46,8	2880
(88)	± 1,3	67,1	52,6	3050
(93)	± 1,3	74,9	58,8	3220
(98)	± 1,3	83,2	65,3	3390
(103)	± 1,5	91,9	72,1	3570

[1] In the case of the bracketed widths across flats it is advised that the manufacturer should be consulted beforehand regarding availability.

[2] Cross-section $A = \frac{1}{2}\sqrt{3} \cdot s^2 \approx 0.866 \cdot s^2$

3.1.2. For hot rolled hexagon steel, corner radiusing r according to Table 2 is permitted.

Table 2.

Width across flats s		Permissible corner radiusing r
over	up to	maximum
—	20	1
20	30	1,5
30	50	2
50	83	2,5
83	103	3

3.2. Straightness

The straightness tolerance of the generating line for hot rolled hexagon steel according to this Standard is given by the values according to Table 3.

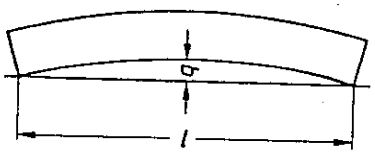

Table 3.

Width across flats		q
over	up to	
	40	No provisions
40	83	$0{,}004 \cdot l$
83	103	$0{,}0025 \cdot l$

Straightness requirements more exacting than above are to be agreed when ordering.

3.3. Winding

The maximum permissible amount of winding in hot rolled hexagon steel should be agreed as necessary when ordering.

4. Material

Hot rolled hexagon steel according to this Standard shall preferably be made of the steel grades according to DIN 17100, DIN 17200, DIN 17210 and DIN 1651.

The steel grade required shall be indicated when ordering.

5. Weight and permissible weight variations

5.1. The weight stated in Table 1 has been calculated from the cross-section on the basis of a density of 7.85 kg/dm³.

5.2. Permissible weight variations as percentages of total weight are given in Table 4.

The weight variation for the purpose of this Standard is the difference between the actual weight delivered and the weight as calculated from the weight according to Table 1 and the metres delivered (when ordering in manufacturing lengths) or the metres ordered (when ordering in fixed and exact lengths).

Table 4.

Width across flats s		Permissible weight variations for delivery quantities	
over	up to	≧5 t	<5 t
—	15	±6 %	±8 %
15	103	±4 %	±5,3 %

6. Finish

The bar ends of hot rolled hexagon steel intended for cold drawing must not exhibit any winding. At one end, which must be carefully definned and must not exhibit any upset, the bar must be capable of being entered in the usual way into the drawing die. The other end of the bar must be sufficiently free from fins and ridges to prevent any hammering effect on leaving the drawing die.

7. Mode of delivery

7.1. The length particulars according to Table 5 apply to the delivery of hot rolled hexagon steel.

7.2. When ordered on a weight only basis, the length may vary between the stated maximum and minimum values for the manufacturing length.

Table 5.

Nature of length	Length		Order details for the length
	Range	permissible variation	
Manufacturing length	3000 to 8000	anywhere between the limits stated for the length range	none
Fixed length	up to 8000	±100	required fixed length in mm
Exact length	up to 8000	preferable: ±50, ±25, ±10, ±5	required exact length and required permissible variation in mm

7.3. Example of order

100 t hot rolled hexagon steel of width across flats s = 18 mm in free cutting steel covered by the code number 9 SMn 28 or the material number 1.0715 according to DIN 1651 in manufacturing lengths:

100 t Hexagon 18 DIN 1015 - 9 SMn 28

or 100 t Hexagon 18 DIN 1015 - 1.0715

8. Testing dimensional accuracy

8.1. Extent of testing

The number of bars which shall be measured for dimensional accuracy at the manufacturer's works prior to despatch shall be agreed when ordering.

8.2. Procedure of testings

8.2.1. The width across flats shall be measured at a distance of not less than 150 mm from the end of the bars when delivery is made in manufacturing lengths, and at any point desired when delivery is made in fixed and exact lengths.

8.2.2. When testing straightness according to Section 3.2 the dimension q shall be measured over the full length of the bar.

Explanations

In this issue of DIN 1015 the gradation of the widths across flats has been matched to the range of nominal dimensions in the new issue of DIN 176, the following drawing allowances, which are related to the dimensions of the bright steel (data in mm) having been applied:

Width across flats in DIN 176	Drawing allowance in DIN 1015
< 19	+ 1,0
$\geq 19 \quad < 50$	+ 1,5
$\geq 50 \quad < 75$	+ 2,0
≥ 75	+ 3,0

The resulting nominal dimension range can be seen from Table 1. It is largely in agreement with the particulars in Euronorm 61 which, however, contains additionally the widths across flats 21.5 - 24.5 - 27.5 and 30.5 mm, but on the other hand is limited to widths across flats up to 83 mm. Compared with the previous issue of DIN 1015 dated October 1963 the partial new provision of the drawing allowances has meant that some of the width across flats values in the range from 20 to 77 mm have been increased by 0.5 or 1 mm. The nominal dimensions 19, 24, 27, 30.5 and 34 mm have not been included in the new issue, since they are no longer needed as primary dimensions for the manufacture of bright hexagon steel.

In Table 1 the nominal dimensions, which, according to the statistics of the steelmakers are now ordered on only a small scale, have been placed in brackets. In the case of these widths across flats prior consultation with the manufacturer regarding availability is advisable.

The particulars regarding permissible dimension and form variations have been taken over unchanged from the previous version of the DIN Standard with the single exception that, in agreement with Euronorm 61, the gradation of the values takes place at 83 mm (instead of 80 as previously). Also derived from the Euronorm are the additional provisions regarding permissible corner radiusing (Section 3.1.2) and the finishes of the bar ends (Section 6). It should also be mentioned that the Euronorm gives a further class of grade accuracy for which the permissible variations of the width across flats amount to about 60 to 80 % of the values according to DIN 1015. This class is also subject to tighter straightness tolerances, and a maximum value for the permissible variation between the smallest and largest width across flats is guaranteed. Bar drawing mills in Germany see no need for these restricted variations.