UDC 669.14-422.41 June 1969

Bright Square Steel
Dimensions, Permissible Variations, Weights

DIN 178

Blanker Vierkantstahl; Maße, zulässige Abweichungen, Gewichte

Dimensions in mm

1. Scope

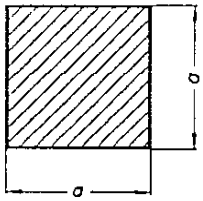
This Standard applies to bright steel of square cross-section with the lengths of side indicated in Table 1 and in the steel grades according to Section 5.

This Standard does n o t apply to bright key steel with square cross-section (see DIN 6880).

2. Definition

Bright square steel is descaled steel shaped by a cold, noncutting process imparting a smooth, bright finish and a correspondingly high standard of dimension accuracy.

3. Designation



Designation of bright square steel with length of side a = 30 mm in the steel grade bearing the code number USt 37-1 K or the material number 1.0120.07:

Square 30 DIN 178 - USt 37-1 K
or Square 30 DIN 178 - 1.0120.07

In place of the denomination "square" the abridged form "4 kt" according to DIN 1353 Part 1 (at present still circulating as draft, August 1966 issue) may be used.

4. Dimensions and permissible dimension and form variations

4.1. Lengths of side

The lengths of side in which bright square steel is principally supplied according to this Standard, and the permissible variations thereon, are indicated in Table 1.

4.2. Edge condition

Any special requirements in regard to dimension accuracy of the edges are to be agreed at the time of ordering.

4.3. Straightness

The bars are supplied straight as judged by the eye; any special requirements in regard to straightness are to be agreed at the time of ordering (see Explanations).

5. Material

Bright square steel according to this Standard is made mainly from USt 37-1 K according to DIN 1652; other grades of steel are to be specially agreed.

The desired grade of steel is to be stated when ordering.

6. Weight

The weight indicated in Table 1 has been calculated from the cross-section on the basis of a density of 7.85 kg/dm^3.

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Table 1. Length of side, permissible variation, cross-section and weight

Length of side a	permissible variation [1]	Cross-section mm²	Weight kg/m
2	-0,060	4	0,0314
3		9	0,0707
3,5	-0,075	12,25	0,0962
4		16	0,126
4,5		20,25	0,159
5		25	0,196
5,5		30,25	0,237
6		36	0,283
7	-0,090	49	0,385
8		64	0,502
9		81	0,636
10		100	0,785
11	-0,110	121	0,950
12		144	1,13
13		169	1,33
14		196	1,54
(15)		225	1,77
16		256	2,01
(17)		289	2,27
18		324	2,54
(19)	-0,130	361	2,83
20		400	3,14
22	-0,130	484	3,80
(24)		576	4,52
25		625	4,91
(27)		729	5,72
28*		784	6,15
(30)		900	7,07
32	-0,160	1024	8,04
(35)		1225	9,62
36		1296	10,2
40		1600	12,6
45		2025	15,9
50		2500	19,6
(55)		3025	23,7
(60)	-0,190	3600	28,3
63*		3970	31,2
[(65)]		4225	33,2
70	-0,300	4900	38,5
[(75)]		5625	44,2
80		6400	50,2
100	-0,350	10 000	78,5

Dimensions in round brackets () are not contained in the preferred number series R 10 and R 20 according to DIN 323 or are little used and therefore preferably avoided. It is intended to delete them in due course.
Dimensions in square brackets [] can only be manufactured from the primary material by repeated drawing and must therefore be specially prepared.
Dimensions identified by an asterisk * are contained in the preferred number series R 10 and R 20 according to DIN 323 and should therefore be ordered in preference to adjacent dimensions in round brackets. Since there is little call for these dimensions at the present time, however, it is advisable to make enquiries regarding delivery.

[1]) Corresponding to ISO tolerance zone h11 for lengths of side up to 65 mm, corresponding to ISO tolerance zone h12 for lengths of side over 65 mm.

7. Mode of delivery

7.1. For the delivery of bright square steel, the length particulars in Table 2 apply.

7.2. Bright square steel in the smaller dimensions can also be delivered in coils. Delivery in this manner must be separately agreed when ordering and particulars of required coil weights and dimensions are to be stated.

7.3. Example of order

1000 kg of bright square steel with length of side a = 30 mm in the steel grade bearing the code number USt 37-1 K or the material number 1.0120.07 in manufacturing lengths:

1000 kg square 30 DIN 178 - USt 37-1 K
or 1000 kg square 30 DIN 178 - 1.0120.07

8. Testing for dimension accuracy

8.1. Extent of testing

The number of bars or coils to be subjected to a check of dimension accuracy on despatch from the manufacturer is to be agreed when ordering.

8.2. Test procedure

8.2.1. In the case of manufacturing lengths and stock lengths and on coils also, the length of side is always checked at a distance of 150 mm from the end. In the case of fixed lengths and accurate lengths, however, the length of side may be rechecked at a distance of 10 mm from the end of the bar.

8.2.2. Where special requirements in respect of the straightness of bars are agreed, the method of measuring straightness shall also be agreed.

Table 2.

Nature of length supplied	Length		Length specification when ordering
	Range	permissible variation	
Manufacturing length	6000 to 8000 [1]	anywhere between the limits stated for the length range; not more than 10 % of the delivered quantity may be supplied as short lengths up to half the lower limit	none
Stock length	3000 to 4000	anywhere between the limits stated for the length range	Stock length
Fixed length	1000 to 12 000	±100	desired fixed length in mm
Exact length	1000 to 12 000	less than ±100 to ±2; the following are preferred: ±50, ±25, ±10, ±5, ±2	desired exact length and desired permissible variation in mm

[1] When required, manufacturing lengths up to 15000 mm are available.

Explanations

The present issue of DIN 178 reflects the desirability of giving preference in future to the use of dimensions corresponding to the preferred number series R 10 and R 20 according to DIN 323. The lengths of side 28 and 63 mm have therefore been included as additions to Table 1. These dimensions should be preferentially ordered instead of the adjacent dimensions. Since they have not yet been generally introduced it is probably advisable initially for the customer to enquire about availability. In response to wishes expressed by users, square steel with 13 mm length of side has also been included. One of the uses of this dimension is in the manufacture of thin square nuts according to DIN 562. All dimensions which do not correspond with the preferred number series have been placed in round brackets. At the next revision of this Standard the question of deleting some of these dimensions will be considered.

The arrangement of the new issue of DIN 178 as well as the provisions regarding preferred materials (Section 5), which have been slightly amended compared with the previous issue, and the kinds of length supplied (Table 2) have been brought into line with the particulars in the new version of DIN 174. In the same way as for bright flat steel according to DIN 174, accurate numerical values for permissible variations on straightness are also to be specified for bright square steel in the next issue of DIN 178.

The Committee for Iron and Steel invites the submission of proposals and test data for this purpose.