UDC 669.14-122.4-422.41

July 1978

Steel Bars

Hot Rolled Squares for General Purpose

Dimensions, Permissible Deviations on Dimension and Form

DIN 1014 Part 1

Stabstahl; Warmgewalzter Vierkantstahl für allgemeine Verwendung; Masse, zulässige Mass- und Formabweichungen

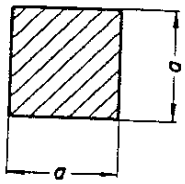
For connection with Recommendation **ISO/R 1035/II – 1969** issued by the International Organization for Standardization (ISO) as well as Euronorm **59** issued by the European Community for Coal and Steel, see Explanations.

Dimensions in mm

1 Scope

This Standard applies to hot rolled squares intended for general purpose in straight bars with a side length of 8 to 120 mm made from the steel grades specified in Section 4.

2 Designation



Designation of a hot rolled square with side length $a \approx 20$ mm made from a steel with the code number USt 37-2 resp. the material number 1.0036 *) according to DIN 17 100:

Square DIN 1014 – USt 37-2 – 20
or Square DIN 1014 – 1.0036 – 20

Instead of the denomination "square" the abbreviation "4kt" according to DIN 1353 Part 2 may be used.

3 Dimensions and permissible deviations on dimension and form

3.1 Side lengths

3.1.1 The side lengths included in this Standard and the permissible deviations on them are given in Table 1.

Series A contains the preferred side lengths. The side lengths in Series B should be ordered only when it is not possible to use a dimension in Series A.

*) New material number, which will be incorporated in the successor issue of DIN 17 100 (at present circulating as draft) (formerly 1.0112)

Continued on pages 2 to 3
Explanations on page 4

Table 1. **Side length, permissible deviations, cross-section, weight and surface area**

Side length a			Cross-section	Weight [2]	Surface area
Series A [1]	Series B [1]	Perm. dev.	cm^2	kg/m	cm^2/m
8		±0.4	0.640	0.502	320
10			1.00	0.785	400
12			1.44	1.13	480
	13		1.69	1.33	520
14			1.96	1.54	560
	15		2.25	1.77	600
16		±0.5	2.56	2.01	640
18			3.24	2.54	720
	19		3.61	2.83	760
20			4.00	3.14	800
22			4.84	3.80	880
	24		5.76	4.52	960
25			6.25	4.91	1000
	28	±0.6	7.84	6.15	1120
30			9.00	7.07	1200
32		±0.6	10.2	8.04	1280
35			12.3	9.62	1400
40		±0.8	16.0	12.6	1600
	45		20.3	15.9	1800
50			25.0	19.6	2000
	55	±1.0	30.3	23.7	2200
60			36.0	28.3	2400
	65		42.3	33.2	2600
70			49.0	38.5	2800
80			64.0	50.2	3200
	90	±1.3	81.0	63.6	3600
100			100	78.5	4000
	110	±1.5	121	95.0	4400
	120		144	113	4800

[1] See Section 3.1.1
[2] See Section 5

3.1.2 A rounding-off of the edges r as given in Table 2 is permissible for hot rolled squares according to this Standard.

Table 2. **Permissible rounding-off of the edges r**

Side length a		Permissible rounding-off of the edges r
over	up to	maximum
	12	1
12	20	1,5
20	30	2
30	50	2,5
50	100	3
100	120	4

3.1.3 The difference between the two diagonals of a given cross-section shall not exceed 4 %; the rounding-off of the edges r shall be taken into account in determining this.

3.2 Straightness

The permissible deviations as given in Table 3 apply for straightness of squares according to this Standard.

Table 3. **Permissible deviations from the straightness**

Side length a		Permissible deviation q from the straightness
over	up to	
	25	Not stipulated
25	80	$0{,}004 \cdot l$
80	120	$0{,}0025 \cdot l$

More stringent requirements on straightness shall be agreed when ordering.

3.3 Twist

The twist of squares must not exceed the values given in Table 4.

Table 4. **Permissible twist**

Side length a		Permissible twist
over	up to	
	14	4°/m, max. 24°
14	50	3°/m, max. 18°
50		3°/m, max. 15°

4 Material

This Standard can be applied to all hot rolled steels. The required steel grade should be specified in the designation.

5 Weight

The weight given in Table 1 has been calculated on the basis of a density of 7.85 kg/dm^3. In the case of alloy steels the density specified in the appropriate quality standards should be used for the weight calculation.

6 Mode of delivery

6.1 The data on lengths given in Table 5 apply to deliveries of hot rolled squares according to this Standard.

6.2 When ordering by weight, the length may vary between the maximum and minimum dimensions specified for manufacturing lengths.

6.3 Example of order

100 t hot rolled squares with side length a = 20 mm made of a steel with the code number USt 37-2 resp. the material number 1.0036 according to DIN 17 100 in manufacturing lengths:

100 t Square DIN 1014 – USt 37-2 – 20
or **100 t Square DIN 1014 – 1.0036 – 20**

7 Testing of accuracy to size

7.1 Extent of testing

The number of bars which shall be tested for accuracy to size by measurements at the manufacturer's works prior to despatch shall be agreed when ordering.

7.2 Testing procedure

7.2.1 The side length according to Section 3.1 shall be measured at least 150 mm from the end of the bars when manufacturing lengths are supplied and at any point when fixed and exact lengths are supplied.

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

7.2.3 The twist (see Section 3.3) should be measured over the full length of the bar.

Table 5. **Types of lengths and permissible length deviations**

Type of length	Side length a	Length		Details of order concerning the length
		Range [1]	Permissible deviation	
Manufacturing length [2]	< 70 ≧70 < 120 ≧120	≧ 6000 ≦12 000 ≧ 3000 ≦ 9 000 ≧ 3000 ≦ 6 000	See Section 6.2	None [2]
Fixed length	< 70 ≧70 < 120 ≧120	≧ 6000 ≦12 000 ≧ 3000 ≦ 9 000 ≧ 3000 ≦ 6 000	± 100 [3]	Required fixed length in mm
Exact length	< 70 ≧70 < 120 ≧120	≧ 6000 ≦12 000 ≧ 3000 ≦ 9 000 ≧ 3000 ≦ 6 000	< ± 100 Preferred: ± 50, ± 25, ± 10, ± 5 [3]	Required exact length and required permissible deviation in mm

1) Enquiries should be made to the manufacturer as to whether shorter or longer lengths can be supplied.
2) Squares can also be supplied in limited manufacturing lengths with a length range to be stated when ordering. The span between the shortest and greatest length in this range must be at least 2000 mm (e.g. 6000 to 8000).
3) The total spans for the permissible deviations may, by agreement, be arranged entirely on the plus side, e.g. $^{+200}_{0}$ (instead of ± 100) in the case of fixed lengths or $^{+50}_{0}$ (instead of ± 25) in the case of exact lengths.

Explanations

In conjunction with the negotiations on the revision of Euronorm 59 – Hot rolled squares for general purpose – DIN 1014 (October 1963 issue) has also been revised. A predominant consideration was the extent to which it whould be possible to reduce the number of standardized side lengths. The basis of the discussions was the statistics on ordered and delivered quantities in recent years and the content of the international standards.

The scope of Euronorm 59 and also of ISO R 1035/II (March 1969 issue, currently being revised) covers only hot rolled squares for general purpose, whereas DIN 1014 formerly covered all dimensions, i.e. dimensions used for various applications. To provide comparability with the international regulations and to give customers a better view into supply possibilities, the DIN Standard has been divided, with the agreement of all the German bodies represented, into a Part 1 – Hot rolled squares for general purpose – and a Part 2 – Hot rolled squares for special purpose (e.g. for further processing by drawing, for chain manufacture etc.). DIN 1014 Part 1 therefore is now directly comparable with the international standards, but there are still no international regulations for squares for special purpose.

The October 1963 issue of DIN 1014 contained 62 side lengths. Of these the following 17 dimensions have been deleted:

6 – 7 – 9 – 11 – 21 – 26 – 29 – 33 – 36 – 43 – 48 – 56 – 75 – 85 – 130 – 140 and 150 mm.

Part 1 covers 29 side lengths, which also appear in the new issue of Euronorm 59 (1977) with the exception of the nominal dimensions 15 – 19 – 28 – 65 and 110 mm. A further 16 side lengths for special purpose are standardized in Part 2.

The nominal dimensions have been subdivided into Series A and B in Part 1. The side lengths in Series A should be ordered for preference. The dimensions in Series B are used to a lesser extent and in some cases they will require longer delivery dates.

In addition, the following amendments and additions have been made compared with the October 1963 issue:

1. Provision of maximum values for the difference in the length of the two diagonals (i.e. limitation of the deviations from the exact square cross-section);
2. Specification of maximum values for twist in the case of squares for general purpose (experience will have to be acquired as to the measurability of these form deviations);
3. Extension of the provisions on the permissible deviation from the straightness to side lengths over 25 to 40 mm;
4. Deletion of the details on the permissible weight deviations in accordance with the agreements in principle for steel bars of simple cross-sectional forms;
5. Adaptation of the values for the length ranges and permissible length deviations to the provisions in the new issue of DIN 1013 Part 1 and Part 2 for hot rolled round steel.