

International Standard



1035/4

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Hot-rolled steel bars — Part 4 : Tolerances

Barres en acier laminées à chaud — Partie 4 : Tolérances

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 1035/4 was developed by Technical Committee ISO/TC 17, *Steel*, and was circulated to the member bodies in April 1981.

It has been approved by the member bodies of the following countries :

Australia	India	Romania
Austria	Italy	South Africa, Rep. of
Brazil	Japan	Spain
Canada	Kenya	Sweden
China	Korea, Dem. P. Rep. of	Switzerland
Czechoslovakia	Korea, Rep. of	Tanzania
Egypt, Arab Rep. of	Netherlands	Turkey
France	New Zealand	United Kingdom
Germany, F.R.	Norway	USSR
Hungary	Poland	

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Belgium
USA

This second edition cancels and replaces the first edition (i.e. ISO 1035/4-1976).

Hot-rolled steel bars — Part 4 : Tolerances

1 Scope and field of application

This International Standard specifies metric dimensional tolerances applicable to hot-rolled steel bars supplied in straight lengths in the following product forms :

- a) round bars (for dimensions, see ISO 1035/1);
- b) square bars (for dimensions, see ISO 1035/2);
- c) hexagonal bars;
- d) octagonal bars;
- e) flat bars (for dimensions, see ISO 1035/3).

The tolerances achievable by the manufacturer may vary with the steel types. The tolerances required by the purchaser may differ according to the application of the bars. Thus this International Standard specifies several tolerance classes (see table 1). The appropriate tolerance class should be specified in the International Standard relevant to the steel grades and, where appropriate, on the order.

2 References

ISO 1035/1, *Hot-rolled steel bars — Part 1 : Dimensions of round bars.*

ISO 1035/2, *Hot-rolled steel bars — Part 2 : Dimensions of square bars.*

ISO 1035/3, *Hot-rolled steel bars — Part 3 : Dimensions of flat bars.*

3 Survey on tolerance classes and their designations

Table 1 gives a survey on the different dimensional tolerance classes specified in this International Standard and on the designations applied for these.

4 Tolerances of hot-rolled steel round, square, hexagonal and octagonal bars

4.1 Tolerances on size

4.1.1 The tolerances on size shall be as specified in table 2 (see 4.5).

4.1.2 The permissible **ovality** for all diameters of round bars, measured as the difference between the maximum and minimum diameters of the same cross-section, shall be 75 % of the total tolerance specified on the diameter according to table 2 (for example 1,2 mm for a nominal diameter of 40 mm ordered according to tolerance class N) (see 4.5).

4.1.3 The permissible **out-of-square** for all sizes of square bars, measured as the difference of the distance between parallel faces of the same cross-section, shall be 75 % of the total tolerance specified on the normal width of side in table 2 (see 4.5).

4.1.4 The permissible **out-of-section** for all sizes of hexagonal and octagonal bars, measured as the maximum difference in the distances across opposite flats of the same cross-section (three measurements in the case of hexagonal bars, four measurements in the case of octagonal bars) shall be 75 % of the total tolerance for the nominal size according to table 2 (see 4.5).

4.2 Tolerances on length

The tolerances on length shall be as specified in table 3.

4.3 Straightness tolerances

The straightness tolerances shall be as specified in table 4 (see 4.5).

4.4 Twist tolerances

If for squares, hexagons and octagons twist tolerances are required by the purchaser, this shall be specified on the order and the method of measurement shall be agreed, together with the values to be achieved (see 4.5).

4.5 Applicability of the tolerances

In cases where length tolerance classes 0 or 1 (see table 3) are specified, the measurement of the tolerances given in 4.1 and 4.3 or agreed under 4.4 apply to a distance of not less than 100 mm from each end of the bar. In the case of the other length tolerance classes, the tolerances apply to the total length of the bar.

5 Tolerances of hot-rolled flat bars

5.1 Tolerances on width

The tolerances on width of hot-rolled flat bars shall be as specified in table 5 (see 5.6).

5.2 Tolerance on thickness

The tolerance on thickness of hot-rolled flat bars shall be as specified in table 6 (see 5.6).

5.3 Tolerances on length

The tolerances on length for flat bars shall be as specified in table 3.

5.4 Straightness tolerances

The straightness tolerances (see the figure) shall be as specified in table 4 (see 5.6).

5.5 Twist tolerances

If twist tolerances are required by the purchaser, this shall be specified in the order and the method of measurement shall be agreed together with the values to be achieved (see 5.6).

5.6 Applicability of the tolerances

In cases where length tolerance classes 0 or 1 (see table 3) are specified, the measurement of the tolerances given in 5.1, 5.2 and 5.4 or agreed under 5.5 apply to a distance of not less than 100 mm from each end of the bar. In the case of the other lengths tolerance classes, the tolerances apply to the total length of the bar.

Table 1 — Survey on the different tolerance classes and their designations

Tolerance classes for													
		Size			Length				Straightness		Twist	Ovality of rounds	Out-of-square or sections
Bars rounds, squares, hexagons, octagons	Designation of tolerance class	N (= normal)	F (= fine)	S ¹⁾ (= superfine)	L0	L1	L2	L3	L4	A (= normal)	B (= fine)	—	—
	For details see	Sub-clause 4.1.1 and table 2			Sub-clause 4.2 and table 3				Sub-clause 4.3 and table 4		Sub-clause 4.4	Sub-clause 4.1.2	Sub-clauses 4.1.3 and 4.1.4
Flat bars	Designation of tolerance class				L0	L1	L2	L3	L4	A (= normal)	B (= fine)	—	—
	For details see	Width : Sub-clause 5.1 and table 5 Thickness : Sub-clause 5.2 and table 6			Sub-clause 5.3 and table 3				Sub-clause 5.4 and table 4		Sub-clause 5.5	—	—

1) Only for rounds.

Table 2 — Tolerances on size for hot rolled round, square, hexagonal and octagonal steel bars

Nominal sizes ¹⁾		Tolerance on size for classes		
Over	Up to and including	N	F	S ²⁾
mm	mm	mm	mm	mm
—	15	± 0,4	± 0,3	± 0,2
15	25	± 0,5	± 0,4	± 0,25
25	35	± 0,6	± 0,5	± 0,3
35	50	± 0,8	± 0,6	± 0,4
50	80	± 1,0	± 0,8	± 0,5 ³⁾
80	100	± 1,3	± 1,0	—
100	120	± 1,6	± 1,3	—
120	160	± 2	± 1,6	—
160	200	± 2,5	± 2,0	—
200	—	± 1,5 % of size	± 1,2 % of size	—

1) Diameter of round bars, distance across flats of square, hexagonal and octagonal bars.

2) Applicable to round bars only.

3) Applicable only to sizes up to and including 65 mm. For larger sizes, the tolerances should be agreed at the time of ordering.

Table 3 — Tolerances on length

Nominal lengths	Tolerances on length for class					
	L0	L1	L2	L3	L4	
mm	mm	mm	mm	mm	mm	mm
All	1)	± 200	0 + 100 ²⁾	0 + 50 ²⁾	0 + 25 ²⁾	3)

1) The length of the bar is left to the choice of the manufacturer, it shall be not less than 3 m and not more than 12 m.

2) When agreed at the time of ordering, the bars can be supplied with symmetrical "±" tolerances. In this case, the total tolerance range shall be the same as specified for the relevant "+" tolerances (for example ± 25 mm instead of 0 mm).

3) Tighter tolerances in cases where cold cutting is possible might be agreed at the time of enquiry and order.

Table 4 — Straightness tolerances

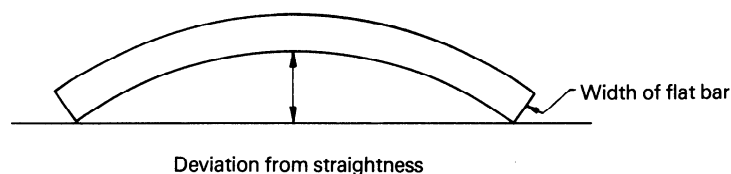
Measuring	Straightness tolerance	
	A normal	B fine
In any one metre length	4,0 mm/m	2,5 mm/m
Over the total length (l)	0,004 × l	0,002 5 × l

Table 5 — Normal tolerances on the width of flat bars

Nominal widths		Tolerances on width
Over	Up to and including	
mm	mm	mm
—	50	± 0,8
50	75	± 1,2
75	100	± 1,5
100	125	± 2,0
125	150	± 2,5

Table 6 — Normal tolerances on the thickness of flat bars

Nominal thicknesses		Tolerances on thicknesses for nominal widths (b)	
Over	Up to and including	b < 50 mm	50 mm < b < 150 mm
mm	mm	mm	mm
—	20	± 0,4	± 0,5
20	40	± 0,8	± 1,0
40	—	—	± 1,5

**Figure — Deviation from straightness**

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