

Hot rolled round steel bars for general purposes — Dimensions and tolerances on shape and dimensions

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ICS 77.140.60

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Hot rolled round steel bars for general purposes - Dimensions and tolerances on shape and dimensions

Ronds laminés à chaud - Dimensions et tolérances sur la
forme et les dimensions

Warmgewalzte Rundstäbe aus Stahl - Maße,
Formtoleranzen und Grenzabmaße

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Foreword

This document (EN 10060:2003) has been prepared by Technical Committee ECISS/TC 11 "Structural steel sections and hot rolled steel bars for engineering use — Dimensions and tolerances", the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2004, and conflicting national standards shall be withdrawn at the latest by April 2004.

This European Standard replaces:

EURONORM 60-77 *Hot rolled round bars for general purposes.*

EURONORM 65-80 *Hot rolled round steel bars for screws and rivets.*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies the nominal dimensions and the tolerances on dimensions and shape of hot-rolled round steel bars.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 10079:1992, *Definition of steel products*.

EN 10088-1, *Stainless steels — Part 1: List of stainless steels*.

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 10079:1992 apply.

4 Designation

The designation of hot-rolled round steel bars shall comprise:

- the term "round bar";
- the number of this European Standard (EN 10060);
- dimensions in mm (diameter and length (M, F or E, see Table 4)) ;
- tolerance class P, if necessary;
- the number of the quality standard and the steel name or steel number of the ordered steel.

EXAMPLE 1

Round bar EN 10060 - 40x6000M

steel EN 10025 - S235JR

EXAMPLE 2

Round bar EN 10060 - 26,65x3600F - P

steel EN 10083-1 - 42CrMo4

5 Dimensions

Hot rolled round bars for general purposes complying with this European Standard shall be delivered with the specified dimensions range given in Table 1 and illustrated in Figure 1. The preferred dimensions are presented in Table 1.

Hot rolled round bars for precision purposes complying with this European Standard shall be delivered with the specified dimensions range given in Table 1 and Table 2.

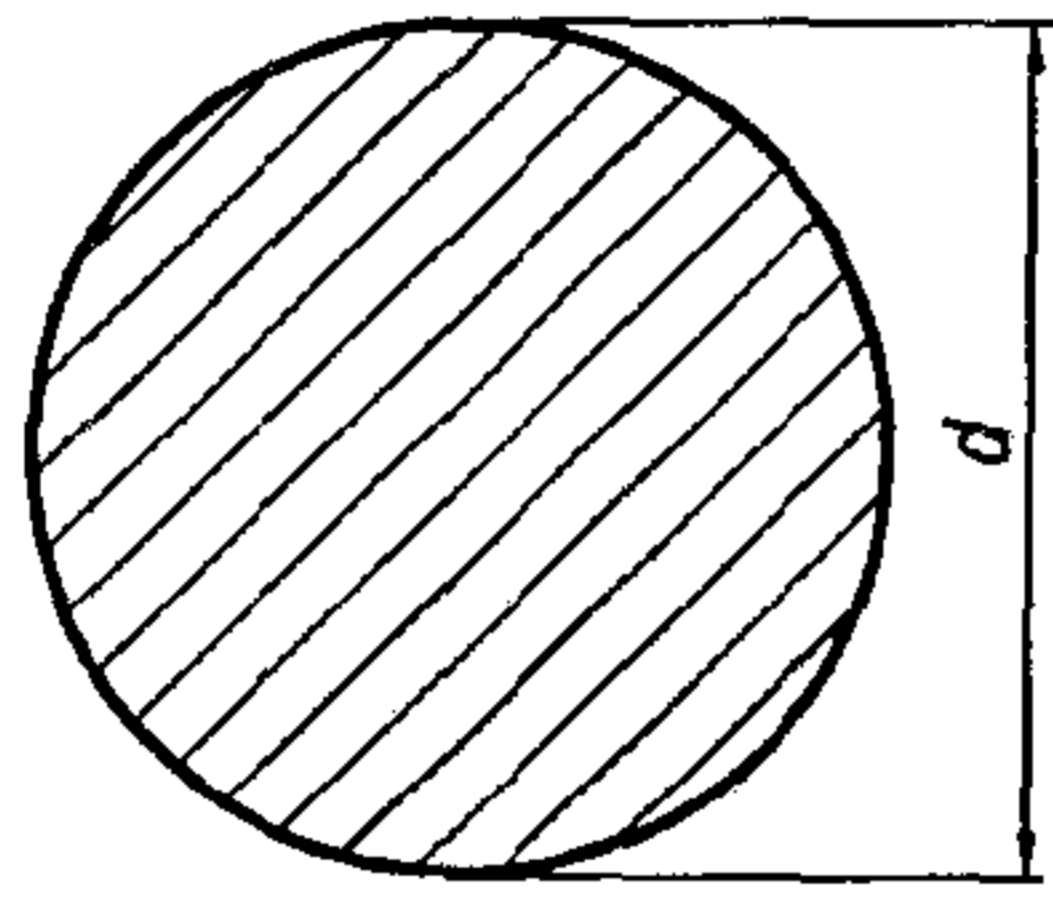


Figure 1 — Hot rolled round bar

Table 1 — Preferred dimensions, mass and dimensional tolerances of hot rolled round steel bars for general and precision purposes

Diameters ^a <i>d</i> (mm)	Limit deviation ^b Normal (mm)	Limit deviation ^b Precision (<i>P</i>) (mm)	Mass ^{c, d} (kg/m)	Area of cross section (cm ²)		
10	± 0,4	± 0,15	0,617	0,785		
12			0,888	1,13		
13		± 0,20	± 0,20	1,04	1,33	
14				1,21	1,54	
15				1,39	1,77	
16	1,58			2,01		
18	2,00			2,54		
19	2,23			2,84		
20	2,47			3,14		
22	± 0,5	± 0,20	2,98	3,80		
24			3,55	4,52		
25			3,85	4,91		
26			± 0,25	± 0,25	4,17	5,31
27					4,49	5,73
28					4,83	6,16
30					5,55	7,07
32	6,31	8,04				
35	± 0,6	± 0,30	7,55	9,62		
36			7,99	10,2		
38			8,90	11,3		
40			9,86	12,6		
42			10,9	13,9		
45	± 0,8	± 0,40	12,5	15,9		
48			14,2	18,1		
50			15,4	19,6		
52			16,7	21,2		
55			18,7	23,8		
60	± 1	± 0,50	22,2	28,3		
63			24,5	31,2		
65			26,0	33,2		
70			30,2	38,5		
73			32,9	41,9		
75	± 1,3	± 0,50	34,7	44,2		
80			39,5	50,3		
85			44,5	56,7		
90			49,9	63,6		
95			55,6	70,9		
100	± 1,5	Not applicable	61,7	78,5		
105			68,0	86,6		
110			74,6	95,0		
115			81,5	104		
120			88,8	113		
125	± 2	Not applicable	96,3	123		
130			104	133		
135			112	143		
140			121	154		

Table 1 — Preferred dimensions, mass and dimensional tolerances of hot rolled round steel bars for general and precision purposes (continued)

Diameters ^a <i>d</i> (mm)	Limit deviation ^b Normal (mm)	Limit deviation ^b Precision (<i>P</i>) (mm)	Mass ^{c, d} (kg/m)	Area of cross Section (cm ²)
145	± 2	Not applicable	130	165
150			139	177
155			148	189
160			158	201
165	± 2,5		168	214
170			178	227
175			189	241
180			200	254
190			223	284
200			247	314
220	± 3		298	380
250	± 4		385	491

^a Diameters greater than 250 mm may be delivered with the limit deviation of +/- 6,0 mm.
^b When ordering, the total ranges for the permissible deviations may, by agreement, be entirely on the plus side.
^c Calculated using density of 7,85 kg/dm³
^d The masses of stainless steel bars shall be multiplied by the factors according to EN 10088-1.

Table 2 — Dimensions, mass and dimensional tolerances of hot rolled round steel bars for precision applications, for example for screws and rivets

Diameter <i>d</i> (mm)	Limit deviation Precision (<i>P</i>) (mm)	Mass ^{a, b} (kg/m)	Area of section (cm ²)	Dimension <i>d</i> (mm)	Limit deviation Precision (<i>P</i>) (mm)	Mass ^{a, b} (kg/m)	Area of section (cm ²)
9,75	± 0,15	0,586	0,75	32,55	± 0,30	6,53	8,32
11,75		0,851	1,08	35,55		7,79	9,93
13,75	± 0,20	1,17	1,48	38,55		9,16	11,67
15,70		1,52	1,94	41,50	± 0,40	10,62	13,53
17,70		1,93	2,46	44,50		12,21	15,55
19,70		2,39	3,05	47,50		13,91	17,72
21,70		2,90	3,70	51,50		16,35	20,83
23,65		± 0,25	3,45	4,39			
26,65	4,38		5,58				
29,60	5,40		6,88				

^a Calculated using density of 7,85 kg/dm³
^b The masses of stainless steel bars shall be multiplied by the factors according to EN 10088-1.

6 Tolerances on dimensions and shape

6.1 Diameter (d)

The deviation from nominal diameter (d) shall be within the tolerance given in Table 1 and Table 2.

NOTE In the Table 1 there are two tolerance classes, normal and precision (P).

6.2 Length (L)

Depending on the type of length the bars shall be cut to lengths within tolerances given in Table 4.

6.3 Straightness (q)

The straightness shall comply with the requirements given in Table 3. The requirements for waviness may be agreed at the time of enquiry and order.

6.4 Ovality

The deviation for roundness shall not exceed 75% of the tolerance range given in Table 1 and Table 2.

Table 3 — Tolerances on straightness of hot rolled round bars

Dimensions in mm

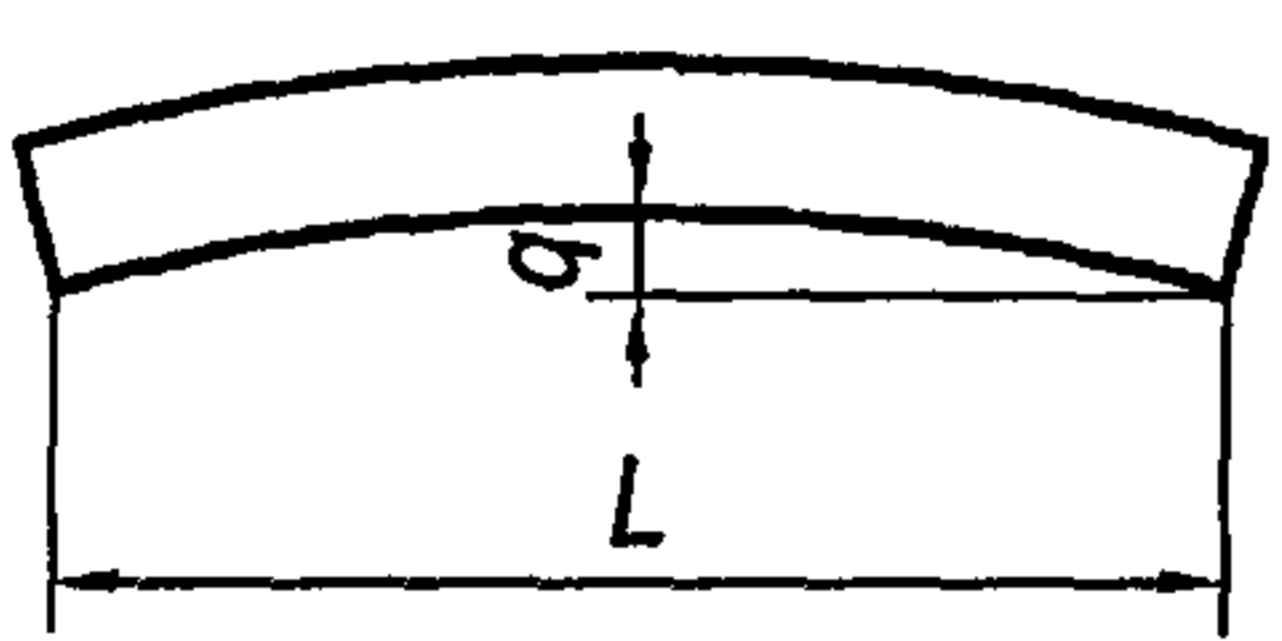
Straightness q		
	Nominal diameter	Tolerance
	$d \leq 25$	<i>Not fixed</i>
	$25 < d \leq 80$	$q \leq 0,4 \% \text{ of } L$
	$80 < d \leq 250$	$q \leq 0,25 \% \text{ of } L$

Table 4 — Tolerances on lengths

Type of length ^a	Range (mm)	Limit deviation ^b
Manufacturing length (M)	3 000 to 13 000 with a range of 2 000 per order item.	10 % of bars supplied may be below the minimum for the ordered range but not less than 75 % of the minimum of the range.
Fixed length (F)	3 000 to 13 000	± 100 mm
Exact length (E)	< 6 000	± 25 mm
	≥ 6 000 to	± 50 mm
	≤ 13 000	
^a The purchaser shall indicate in the enquiry and order the type of length required and the length range or length required.		
^b If agreed during the enquiry and order, products may be delivered on upper limits.		

7 Measurement

7.1 Diameter

The diameter shall be measured at any point situated at least 100 mm from the end of the bar. Shearing may deform the bar ends. The condition of the ends may be agreed at time of enquiry and order.

7.2 Length

The length shall be measured as the longest length of the bar.

7.3 Straightness

The straightness shall be measured over the total length (L) of the bar.

7.4 Ovality

The ovality shall be measured as the difference of the greatest diameter and the smallest diameter in the same plane perpendicular to the axis of the bar. The ovality shall be measured at any point situated at least 100 mm from the end of the bar.

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