UDC 669.14-422.11-408.7 : 001.4 : 621.753.1 DEUTSCHE NORM October 1981

Polished round steel

Dimensions Permissible deviations according to ISO tolerance zone h9

DIN 175

Polierter Rundstahl; Masse, zulässige Abweichungen nach ISO-Toleranzfeld h9

Supersedes 05.59 edition

As it is current practice in standards published by the International Organization for Standardization (ISO), the comma has been used throughout as a decimal marker.

Dimensions in mm

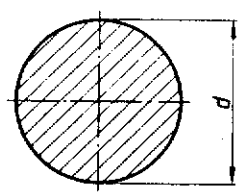
1 Field of application

This standard applies to bright, polished round steel of nominal diameters from 1 to 30 mm of the steels quoted in clause 5. Details as to finish and lengths to be delivered are given in clause 6.

2 Concept

Bright steel is a steel having got a smooth, bright surface by descaling and non-cutting cold working or by machine cutting and showing a high dimensional accuracy. A still better surface finish and a higher dimensional accuracy is achieved by a polished finish.

3 Designation



3.1 For the standard designation the following must be indicated in the order stated:

- term,
- DIN number of the dimensional standard,
- code number or material number of the steel grade,
- nominal diameter

Example:

Designation of polished round steel of 115 CrV 3 steel according to DIN 17 350 of nominal diameter d = 20 mm:

Round DIN 175 – 115 CrV 3 – 20

or Round DIN 175 – 1.2210 – 20

3.2 The term "Round" may be replaced by the abbreviated form "Rd" according to DIN 1353 Part 2.

4 Dimensions, permissible dimensional deviations and deviations of form

4.1 Diameter

4.1.1 The range of deliverable nominal diameters is given in table 1. The required nominal dimension must be stated in the designation (see clause 3).

4.1.2 The permissible deviations from the nominal diameter corresponding to ISO tolerance zone h9 (see also DIN 7160) are given in table 1.

4.1.3 The difference between the maximum and the minimum diameter in the same cross-sectional plane must not exceed 50 % of the permissible range for the deviation in diameter (e.g. 0,026 mm maximum for d = 20 mm).

Table 1. **Diameters and permissible deviations of polished round steel**

Nominal diameter d [1] Range	Permissible deviation from d
from 1 to 3	$^{0}_{-0,025}$
over 3 to 6	$^{0}_{-0,030}$
over 6 to 10	$^{0}_{-0,036}$
over 10 to 18	$^{0}_{-0,043}$
over 18 to 30	$^{0}_{-0,052}$

[1] The weight (in kg/m) for the required nominal diameter d can be calculated from the product $0{,}00617 \cdot d^2$ (d in mm), with a density of 7,85 kg/dm^3 taken as the basis.

4.2 Straightness

Rods are delivered straightened. Special requirements on straightness must be agreed on ordering.

5 Material

Polished round steel according to this standard is preferably supplied in steel grades in accordance with DIN 17 350. Other steel grades can be supplied on agreement.

The steel grade required must be quoted in the designation (see clause 3).

6 Finish and lengths to be delivered

6.1 Finish

Round steel according to this standard is supplied in polished finish.

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DIN 175 Engl. Price group 5

Sales No. 0105

6.2 Lengths to be delivered

6.2.1 Polished round steel according to this standard is normally supplied in rods with the types of length and the permissible deviations in length according to table 2.

6.2.2 When ordering rods in manufacturing length or in stock length, the length may vary between the maximum and minimum dimensions specified in table 2. Rods of a total weight not exceeding 10% of the quantity delivered may fall below the lower limit of the length range. The length, however, must be at least 50% of the lower limiting value.

6.2.3 If in manufacturing length and stock length, rod ends are usually delivered in sheared-off form. Cut off ends, sawn ends, seperated ends or chamfered ends may be agreed.

Table 2. **Types of length and permissible deviations in length**

Type of length	Length		Details concerning length to be indicated on ordering
	Range	Permissible deviation	
Manufacturing length	2000 to 12000	see subclause 6.2.2	none
Stock length	3000 to 4000 6000 to 7000	see subclause 6.2.2	"stock length" and required length range
Exact length	1000 to 12000	to be indicated on ordering [1]	required exact length and required permissible deviation [1] in mm

1) The minimum available deviations in length are
± 2 mm for exact lengths ≦ 4000 mm
± 5 mm for exact lengths > 4000 mm

6.2.4 Examples for ordering

a) 5000 kg of polished round steel of 115 CrV 3 steel and of diameter d = 20 mm, in manufacturing length:

5000 kg round DIN 175 – 115 CrV 3 – 20

or

5000 kg round DIN 175 – 1.2210 – 20

b) 3000 kg of polished round steel of 115 CrV 3 steel and of diameter d = 25 mm, in stock length 3000 to 4000 mm:

3000 kg round DIN 175 – 115 CrV 3 – 25
stock length 3000 to 4000

or

3000 kg round DIN 175 – 1.2210 – 25
stock length 3000 to 4000

c) 1000 kg of bright round steel of 115 CrV 3 steel and of diameter d = 10 mm in exact length of 3500 mm with a permissible deviation in length of ± 10 mm:

1000 kg round DIN 175 – 115 CrV 3 – 10 x 3500 ± 10

or

1000 kg round DIN 175 – 1.2210 – 10 x 3500 ± 10

7 Testing

7.1 Extent of testing

If acceptance testing has been agreed, the number of rods to be tested for dimensional accuracy by the manufacturer must also be agreed.

7.2 Test procedure

7.2.1 The diameter of rods in manufacturing length or stock length must be measured at a distance of at least 150 mm from the end of the rod. On rods in exact length with an agreed permissible deviation in length of less than ± 200 mm, testing must be carried out at a distance of at least 10 mm from the ends.

7.2.2 Checking of the stipulations in subclauses 4.1.1 to 4.1.3 may be carried out by using all suitable methods (limit gap gauges, micrometer callipers, three-point measuring devices etc.). Testing must be carried out at room temperature.

Standards referred to

DIN 1353 Part 2	Abbreviations of terms for semi-finished products
DIN 7160	ISO allowances for external dimensions (shafts) for nominal dimensions from 1 to 500 mm
DIN 17350	Tool steels; technical delivery conditions

Further standards

DIN 668 Bright round steel; dimensions, permissible deviations according to ISO tolerance zone h11
DIN 669 Bright steel shafts; dimensions, permissible deviations according to ISO tolerance zone h9
DIN 670 Bright round steel; dimensions, permissible deviations according to ISO tolerance zone h8
DIN 671 Bright round steel; dimensions, permissible deviations according to ISO tolerance zone h9
DIN 59360 Ground and polished bright round steel; dimensions, permissible deviations according to ISO tolerance zone h7
DIN 59361 Ground and polished bright round steel; dimensions, permissible deviations according to ISO tolerance zone h6

Previous editions

DIN 175: 10.23, 10.40, 02.43, 05.59

Amendments

As compared with the May 1959 edition the following amendments have been made:

a) The stipulations relating to the designation of the products have been adapted to the rules laid down in DIN 820 Part 27 (clause 3 and subclause 6.2.4).
b) The scope has been limited to nominal diameters from 1 to 30 mm (previously 0,5 to 30 mm). In table 1 all details on the nominal dimensions to be preferred have been deleted.
c) The details on the appropriate materials have been extended (clause 5).
d) The stipulations relating to the finish and lengths of the products to be delivered have been adapted to the present state of the art and to the present ordering practice (clause 6 and table 2). (See also Explanations).

Explanations

The revised editions of dimensional Standards DIN 175, DIN 668, DIN 669, DIN 670, DIN 671, DIN 59360 and DIN 59361 on bright round steel are the result of discussions of a technical committee in which manufacturers and users were represented in equal numbers. The representatives of the consumers did not support the discussed proposal to include all stipulations for the products quoted in one standard because of the numerous amendments to be made in the documents for ordering, drawings, parts lists etc. Consequently, the previous splitting remained unchanged, in principle, so that the following standards apply to the individual ISO tolerance zones, classified according to an increasing dimensional accuracy.

H11: DIN 668
h9: DIN 175 (polished round steel)
DIN 671 (drawn or peeled round steel)
DIN 669 (bright steel shafts)
h8: DIN 670
h7: DIN 59360
h6: DIN 59361

It is intended to realize the proposal of combining these standards in a later revision provided that this proceeding will be adopted in the planned version of an international delivery condition for bright round steel.

The major amendments made in comparison with previous editions of the DIN Standards are explained once more in the following.

a) The range of the nominal diameters covered was restricted in some cases, in other cases it was extended. The details are indicated in the "amendments" clause of the respective standard.
b) The nominal diameters which were not presented as preferred dimensions in previous editions have been deleted from table 1, to concentrate the orders to a smaller number of nominal dimensions. In DIN 175 preferred dimensions are not mentioned because any nominal diameter within the range from 1 to 30 mm will be supplied when ordered.
c) The permissible deviations from the nominal diameter in the individual tolerance zones correspond with DIN 7160 and accordingly with the stipulations of ISO/R 286 – 1962. As compared with previous editions of the dimensional standards, amendments have only been made in the diameter range from 1 to 1,6 mm, for which, in DIN 7160, the same permissible dimensional deviations apply as for the range over 1,6 to 3 mm.
d) With the approval of all parties concerned exact numerical values for the permissible deviations from straightness of the rods were dispensed with again, especially since hardly any complaints on this subject have been made so far. At the request of the users the wording "to the eye" have been deleted from the previous stipulation "straight to the eye", as these words do not furnish any additional proof in cases of complaint. The manufacturers would have rather retained the previous stipulation which has shown its merit in practice and must be regarded as the strictest requirement on straightness.
e) The specifications for the appropriate materials (clause 5) finish and length to be delivered (clause 6) have been adapted to the present state of the art. The remaining contents of the standard remained factually almost unchanged.