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Disclosure to Promote the Right To Information

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"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
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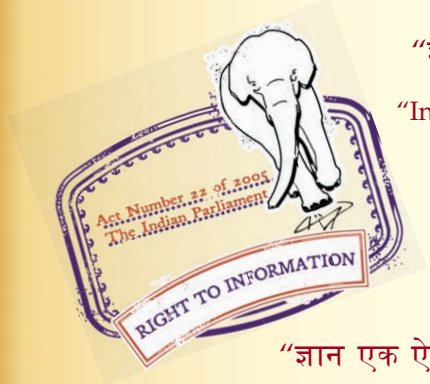
"Step Out From the Old to the New"

IS 7887 (1992): Mild steel wire rods for general engineering purposes [MTD 4: Wrought Steel Products]



"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
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Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS 7887 : 1992
(Reaffirmed 2001)

भारतीय मानक

सामान्य इंजीनियरी प्रयोजनों के लिये मृदु इस्पात तार सरिये — विशिष्टि

(पहला पुनरीक्षण)

Indian Standard

MILD STEEL WIRE ROD FOR GENERAL ENGINEERING PURPOSES — SPECIFICATION

(First Revision)

UDC 669·141·24-412-12

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

January 1992

Price Group 2

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Wrought Steel Products Sectional Committee had been approved by the Metallurgical Engineering Division Council.

Hot-rolled wire rods are produced by rolling billets in continuous rolling mills in the coil form. Keeping in view that trade practices for different end uses require different range and limits of carbon, 15 grades of carbon steels have been incorporated in this revision.

Assistance has been taken from:

i) ASTM — A-510 Wire rods and coarse round wire, carbon steel — General requirements for, USA
ii) JIS G-3505 Low carbon steel wire rods, Japan

For the benefit of the purchaser, informative appendices (Appendix A and Appendix B) giving common defects of wire rods and uses of wire rods respectively have been included.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in thls standard.

Indian Standard

MILD STEEL WIRE ROD FOR GENERAL ENGINEERING PURPOSES — SPECIFICATION

(First Revision)

1 SCOPE

This standard covers the requirements of hot-rolled mild steel wire rods in coils or straightened and cut lengths.

2 REFERENCES

The Indian Standards listed below are necessary adjuncts to this standard:

IS No.	*Title*
228	Methods of chemical analysis of steel
8910 : 1978	General technical delivery requirements for steel and steel products

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

3.1 Wire

A product in coil form obtained from wire rod, generally in round, half round, square, hexagonal, flat or of any other section including grooved section, characterized by the fact that it has been subjected to cold drawing through a die or by other mechanical means. It is usually more severely cold drawn than bright bars.

3.2 Wire Rod

It is generally square, round, half round, rectangular, or polygonal, hot-rolled product in the coiled form, it is generally intended for conversion into wire.

3.3 Coil

One continuous length of rod or wire in the form of coil.

4 SUPPLY OF MATERIAL

General requirements relating to the supply of material shall conform to IS 8910 : 1978.

5 MANUFACTURE

5.1 Steel shall be manufactured by any process of steel making except bessemer process. It may be followed by secondary refining or secondary vacuum melting.

5.2 Steel shall be supplied semi-killed or killed. Rimming steel shall be supplied only by special agreement between the purchaser and the manufacturer.

6 CHEMICAL COMPOSITION

6.1 The ladle analysis of steel when analyzed in accordance with relevant parts of IS 228 or any other established instrumental/chemical method shall be as given in Table 1. In case of dispute, the procedure given in IS 228 and its relevant parts shall be referee method. In case of continuously cast billets, the billet analysis shall be taken as ladle analysis and no separate product analysis shall be required.

Table 1 Chemical Composition

(*Clause* 6.1)

Grade	Constituent, Percent			
	Carbon	Manganese	Sulphur	Phosphorus
(1)	(2)	(3)	(4)	(5)
			Max	*Max*
1	0·06 *Max*	0·35 *Max*	0·050	0·050
2	0·08 *Max*	0·25 to 0·40	0·050	0·050
3	0·10 *Max*	0·70 *Max*	0·050	0·050
4	0·08 to 0·13	0·30 to 0·60	0·050	0·050
4 M	0 08 to 0·13	0·60 to 0·90	0·050	0·050
5	0·10 to 0·15	0·30 to 0·60	0·050	0·050
6	0·13 to 0·18	0·30 to 0·60	0·050	0·050
6 M	0·13 to 0·18	0·60 to 0·90	0·050	0·050
7	0·15 to 0·20	0·30 to 0·60	0·050	0·050
7 M	0·15 to 0·20	0·60 to 0·90	0·050	0·050
8	0·18 to 0·23	0·30 to 0·60	0·050	0·050
8 M	0·18 to 0·23	0·60 to 0·90	0·050	0·050
9	0·20 to 0·25	0·30 to 0·60	0·050	0·050
10	0·22 to 0·28	0.30 to 0·60	0·050	0·050
10 M	0·22 to 0·28	0·60 to 0·90	0·050	0·050

NOTES

1 Silicon to be mutually agreed upon between the purchaser and the manufacturer.

2 When the steel is silicon killed, the product analysis shall show a minimum of 0·10 percent silicon. When the steel is aluminium killed or the total aluminium content should not be less than 0·02 percent. When the steel is Aluminium silicon killed, the silicon content shall not be less than 0·05 percent and total aluminium content shall not be less than 0·01 percent.

3 When required, copper is specified as an added element.

4 If required, other values for sulphur and phosphorous may be agreed between the manufacturer and the purchaser.

6.2 Product Analysis

Permissible variation in case of product analysis from the limits specified under **5.1** shall be as given in Table 2.

Table 2 Permissible Variation for Product Analysis of Carbon Steel

(*Clause* 6.2)

Constituent	Limit, or Maximum Specified Range, Percent	Variation Over Specified Maximum Limits, Percent, *Max*
(1)	(2)	(3)
Carbon	0·25 and under	0·02
	Over 0·25 to 0·55	0·03
Manganese		0·03
Phosphorus		0·005
Sulphur		0·005
Silicon	0·35 and under	0·03
	Over 0·35 to 0·60	0·05

NOTE — Product analysis shall not apply to rimming quality steel.

7 CONDITION OF MATERIAL ON DELIVERY

7.1 Cooling arrangement shall be such as to ensure that the scale is generally less than 1·5 percent.

7.2 The hot-rolled wire rod shall be supplied in the form of coils or straightened and cut lengths. The size and weight of coils shall be as agreed to between the purchaser and the manufacturer.

8 FREEDOM FROM DEFECTS

The finished material shall be free from such surface defects and internal flaws as would be detrimental to the end use of the material. These defects, however, will be ignored in the one-metre length of coil from both ends.

9 SIZES AND TOLERANCES

9.1 The nominal diameters of the wire rods shall be 5 mm onwards with an increment of 0·5 mm.

9.2 The tolerance on the nominal diameter shall be as specified in Table 3.

9.3 Out of Shape

The difference between the maximum and minimum diameters of any cross section shall not exceed the limits specified in Table 3.

Table 3 Tolerance of Wire Rod

(*Clauses* 9.2 *and* 9.3)

Nominal Diameter mm		Tolerance on Diameter mm	Out of Shape mm
Over	Up to and including		
(1)	(2)	(3)	(4)
—	15	± 0·4	0·60
15	25	± 0·5	0·75
25	30	± 0·6	0·90
30	—	*See* note	—

NOTE — Tolerance should be agreed at the time of ordering.

10 PACKING

Each coil of wire rod shall be bound and fastened compactly. Straight lengths shall be packaged into secured lift of hand bundles.

11 MARKING

11.1 Each coil of wire rod shall be legibly marked with the grade, size of wire rod, cast number and trade-mark or name of the manufacturer.

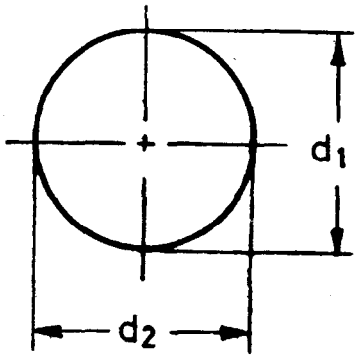
11.1.1 The material may also be marked with the Standard Mark. The details available with the Bureau of Indian Standards.

ANNEX A

(*Foreword*)

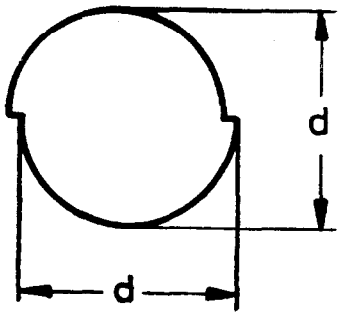
COMMON DEFECTS OF WIRE RODS

A-1 ROLLING DEFECTS (UNDER FILL)



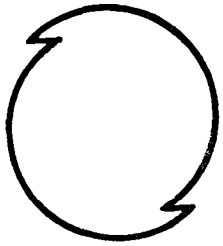
UNDER FILL $d_1 \neq d_2$

A-3 MISMATCHING OF CROSS SECTION



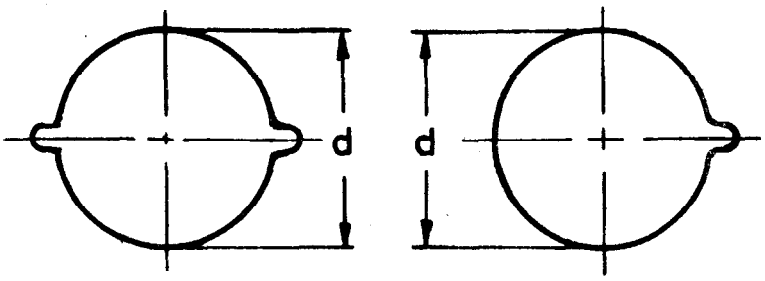
MISMATCHING OF CROSS SECTIONS

A-4 LAPS DEFECTS



LAPS
d, DIAMETER OF WIRE ROD

A-2 FINS DEFECTS



FINS

ANNEX B

(*Foreword*)

USES OF WIRE ROD

B-1 The wire rods in coil form are used mostly for further cold drawing for conversion to making annealed wire, galvanized wire, nails, wood screws, general purpose rivets, bolts and nuts and other cold forged components.

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, tosting and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use oft he Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Revision of Indian Standards

Indian Standards are reviewed periodically and revised, when necessary and amendments, if any, are issued from time to time. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition. Comments on this Indian Standard may be sent to BIS giving the following reference:

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Amendments Issued Since Publication

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AMENDMENT NO. 1 JANUARY 1995
TO
IS 7887 : 1992 MILD STEEL WIRE ROD FOR GENERAL ENGINEERING PURPOSES — SPECIFICATION

(First Revision)

(*Page* 1, *Table* 1, *Note* 4) — Substitute the following for the existing Note:

'4 Any other chemistry may be mutually agreed between the manufacturer and the purchaser.'

(*Page* 1, *Table* 1) — Add the following new Note 5 at the end:

'5 Microalloying may be allowed subject to mutual agreement between the purchaser and the supplier. Microalloying elements like Nb, V or Ti, when used individually or in combination, the total content shall not exceed 0.20 percent .'

(*Page* 2, *Table* 2) — Substitute the following for the existing table:

Table 2 Permissible Variation for Product Analysis of Carbon Steel
(*Clause* 6.2)

Constituent	Limit, or Maximum Specified Range, Percent	Variation Over Specified Maximum or Under the Minimum Limits, Percent *Max*
(1)	(2)	(3)
Carbon	Up to and including 0.25	0.02
	Over 0.25	0.03
Manganese		0.03
Phosphorus		0.005
Sulphur		0.005
Silicon		0.03

NOTES

1 Variations shall not be applicable both over and under the specified limits in several determinations in a heat.

2 Product analysis shall not apply to rimming quality steel.

(*Page* 2, *clause* **9**) — Add the following new clause **10** after clause **9** and renumber the subsequent clauses:

'**10** Physical properties of the product can also be provided by mutual agreement between the manufacturer and the purchaser.'

(MTD 4)

Reprography Unit, BIS, New Delhi, India