इंटरनेट मानक

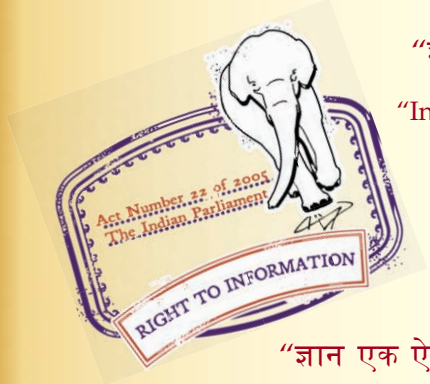
Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

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

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

IS 8952 (1995): Steel ingots,blooms and billets for production of mild steel wire rods for generl engineering purposes [MTD 4: Wrought Steel Products]



"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

IS 8952 : 1995
Reaffirmed 2000

भारतीय मानक

सामान्य इंजीनियरी प्रयोजनों की मृदु इस्पात तार छड़ों के उत्पादन के लिए इस्पात इंगट, ब्लूम और बिलेट – विशिष्टि

(पहला पुनरीक्षण)

Indian Standard

STEEL INGOTS, BLOOMS AND BILLETS FOR PRODUCTION OF MILD STEEL WIRE RODS FOR GENERAL ENGINEERING PURPOSES — SPECIFICATION

(First Revision)

UDC 669·14-412 : 669·141·24-412

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

April 1995

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.

This standard was first published in 1978. The steel ingots, blooms and billets are the raw material for the production of mild steel wire rods for general engineering purposes which is manufactured in large quantity in India. Since the standard for these wire rods, IS 7887 : 1992 'Mild steel wire rod for general engineering purposes — specification (*first revision*)' has been revised, a need was felt to review this standard to ensure that the mild steel wire rod industry receive the requisite quality of raw material. The committee, therefore, decided to revise it in line with the revised IS 7887 : 1992.

In this revision, the following changes have been made:

i) 15 grades of carbon steel have been incorporated, and

ii) Provision of microalloying elements has been included.

For the benefit of the purchaser, an informative Annex A has been included giving particulars to be specified by the purchaser while ordering material to this standard.

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 this standard.

Indian Standard

STEEL INGOTS, BLOOMS AND BILLETS FOR PRODUCTION OF MILD STEEL WIRE RODS FOR GENERAL ENGINEERING PURPOSES — SPECIFICATION

(First Revision)

1 SCOPE

This standard covers the requirements for steel ingots (including cast billet ingots), blooms and billets (including continuously cast billets) for production of mild steel wire rods.

2 REFERENCES

The following Indian Standards are necessary adjunct to this standard:

IS No.	*Title*
228	Methods of chemical analysis of steels
1956 (Part 3) : 1976	Glossary of terms relating to iron and steel : Part 3 Hot rolled steel products (excluding sheet and strip)
4163 : 1982	Method for determination of inclusion content in steel by microscopic method (*first revision*)
8910 : 1978	General technical delivery requirements for steel and steel products
11371 : 1985	Method for macroetch test for wrought steel products
12037 : 1987	Macrographic examination by sulphur print (Baumann method)

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 1956 (Part 3) : 1976 and the following shall apply.

3.1 Ingot

Castings of suitable shape and size intended for subsequent hot working.

3.2 Cast Billet Ingot

An ingot, generally of cross-section not more than 150 mm square which can be rolled directly into merchant products. Cast billet ingot is also sometimes known as 'pencil ingot'.

3.3 Billet

A semi-finished product obtained by forging, rolling or continuous casting, usually square and not exceeding 125 mm × 125 mm in cross-section with rounded or chamfered corners, and is intended for further processing into suitable finished product by forging or re-rolling.

3.4 Microalloying Elements

Elements, such as niobium, vanadium and titanium, added singly or in combination to obtain higher strength levels combined with better formability, weldability and toughness as compared with non-alloyed steel produced to equivalent strength levels.

4 GRADES

Steel for mild steel wire rods shall be of grades specified in Table 1.

5 SUPPLY OF MATERIAL

The general requirements relating to the supply of steel shall conform to IS 8910 : 1978.

6 MANUFACTURE

6.1 Steel shall be manufactured by any process of steel making at the discretion of the manufacturer. It may be followed by secondary refining or vacuum melting.

6.2 Steel shall be semi-killed or killed.

6.3 Sufficient reduction and discard shall be made from each ingot to ensure freedom from pipe, segregation and other harmful defects.

6.4 Removal of surface defects shall be permitted provided that finish dimensions is not less than that specified and that the operation is not likely to affect the end use of the product.

7 CHEMICAL COMPOSITION

7.1 The ladle analysis of the material when carried out in accordance with relevant parts of IS 228 or any other established instrumental/ chemimal 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. However, where the method is not given in IS 228 or its relevant parts, the referee method shall be as agreed to between the purchaser and the manufacturer.

Table 1 Chemical Composition

(*Clauses* 4 *and* 7.1)

Grade	Constituent, Percent			
	Carbon	Manganese	Sulphur *Max*	Phosphorous *Max*
(1)	(2)	(3)	(4)	(5)
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 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 Residual elements which are harmful for the end use applications should be restricted to minimum possible and when necessary should be agreed between the manufacturer and the purchaser.

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

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.

7.1.1 In case of continuously cast billets, the billet analysis may be taken as ladle analysis.

7.2 Product Analysis

Permissible variation in case of product analysis from the limits specified in 7.1 shall be as given in Table 2.

8 SAMPLING

8.1 At least one ladle sample analysis shall be taken per cast.

8.2 If required, the samples for product analysis shall be prepared either by forging or rolling down to 30 mm round sections or to the size of wire rod to be rolled whichever is less.

Table 2 Permissible Variation for Product Analysis of Carbon Steel

(*Clause* 7.2)

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
Phosphorous		0·005
Sulphur		0·005
Silicon		0·03

8.2.1 Drilling shall be taken from the sample (*see* **8.2**) representing two-thirds, one-half and

one-third of height from bottom of the ingot separately.

8.2.2 In case of continuously cast billets and blooms/billets produced from ingots, the sample shall be taken from the location as shown in Fig. 1.

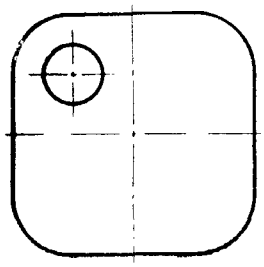


FIG. 1 LOCATION FOR TAKING DRILLING FOR CHECK ANALYSIS

9 FREEDOM FROM DEFECTS

9.1 The blooms, billets and continuously cast billets shall be free from harmful defects, such as pipe, laminations, segregation inclusions and cracks.

9.2 Ingots shall either be supplied free from harmful defects, such as, segregation, piping, cracks, inclusions, and blow-hole by appropriate top and bottom discard and dressing, or supplied with suitable surface dressing only, without top and bottom discard if agreed to between the purchaser and the manufacturer, to ensure the requirements of freedom from defects specified in the relevant product specifications.

10 TEST

If agreed to between the purchaser and the manufacturer the following tests may be carried out:

a) Macroexamination (*see* IS 11371 : 1985);

b) Sulphur print (*see* IS 12037 : 1987); and

c) Inclusion content (*see* IS 4163 : 1982).

11 DIMENSIONS

11.1 The size of ingots and blooms shall be subject to agreement between the purchaser and the manufacturer. However, the following nominal sizes of ingots and blooms, generally supplied are given below for guidance only:

Width Across Flat at Wide End	*Width Across Flat at Narrow End*
mm	mm
100	76
115	90
125	105
150	120
150	130

11.2 The perferred size of billets shall be 50, 63, 71, 80, 90, 100 and 125 mm.

11.3 The sizes other than those specified may be supplied by agreement between the purchaser and the manufacturer.

11.4 Length

Blooms, billets and continuously cast billets shall be supplied in lengths between 3 and 13 metres as specified by the purchaser.

12 TOLERANCES

12.1 In case of steel ingots and blooms a tolerance of ± 5 mm shall be permitted on the specified width across flat.

12.2 In case of billets the following tolerances shall apply:

Width Across Flat	*Tolerance*
mm	mm
Up to and including 75	$\pm$ 1·5
Over 75	$\pm$ 3

12.3 A tolerance of $\pm$ 150 mm shall be permitted on the specified length of ingots, blooms and billets.

13 MARKING

13.1 Unless agreed otherwise, the material shall be marked as given in **13.2** and **13.3**.

13.2 The ends of ingots, blooms and billets shall be painted with a suitable colour.

13.3 Each ingot, bloom and billet shall be legibly stamped or painted with the cast number, grade and the name or trade-mark of the manufacturer.

13.4 BIS Certification Marking

The material may also be marked with the Standard Mark.

13.4.1 The use of the Standard Mark is governed by the provisions of Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

ANNEX A

(Foreword)

BASIS FOR ORDER

A-1 While placing an order for the ingots, blooms and billets covered by this standard, the purchaser should specify clearly the following:

a) Steel grade;
b) Size of ingot/bloom/billet;
c) Size and dimensions of end product;
d) End use;
e) Tests and test reports required; and
f) Special requirements, if any.

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

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards Monthly Addition'.

This Indian Standard has been developed from Doc : No. MTD 4 (3932).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:
Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002

Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices :	Telephone
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	331 01 31 331 13 75
Eastern : 1/14 C. I. T. Scheme VIII M, V. I. P. Road, Maniktola CALCUTTA 700054	37 84 99, 37 85 61 37 86 26, 37 86 62
Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022	60 38 43, 60 20 25,
Southern : C. I. T. Campus, IV Cross Road, MADRAS 600113	235 02 16, 235 04 42 235 15 19, 235 23 15
Western : Manakalaya, E9 MIDC, Marol, Andheri (East) BOMBAY 400093	632 92 95, 632 78 58 632 78 91, 632 78 92

Branch : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD, GUWAHATI. HYDERABAD. JAIPUR. KANPUR LUCKNOW. PATNA. THIRUVANANTHPURAM.

Printed at Printwell Printers, Aligarh, India