



PM/ IS 8952/ 1/ April 2020

PRODUCT MANUAL FOR
Steel Ingots, Blooms and Billets for Production of Mild Steel Wire Rods
for General Engineering Purposes
According to IS 8952:1995

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification licence/certificate.

1.	Product	:	IS 8952:1995
	Title	:	Steel Ingots, Blooms and Billets for Production of Mild Steel Wire Rods for General Engineering Purposes
	No. of amendments	:	0
2.	Sampling Guidelines		
a)	Raw material	:	Iron Ore, Quick Lime, Metallurgical Coke, Natural Gas/Coal(DRI), Sponge Iron, Scrap, Silico Manganese, Ferro Silicon , Ferro Manganese, Aluminium etc.
b)	Grouping Guidelines	:	Please refer Annex - A
c)	Sample Size	:	For Physical tests: Dimensions & Tolerances, Freedom from defects shall be carried out in the factory. For chemical composition:5 pieces of 50 X 50 mm/50 g drillings.
3.	List of Test Equipment	:	Please refer Annex - B
4.	Scheme of Inspection and Testing	:	Please refer Annex - C
5.	Possible tests in a day	:	Freedom from defects, Dimensions & Tolerances, Chemical Composition: By chemical method -- C, S, Mn or By instrumental method –all required elements.
6.	Scope of the Licence :		
	Licence is granted to use Standard Mark as per IS 8952:1995 with the following scope:		
	Name of the product	Steel Ingots, Blooms and Billets for Production of Mild Steel Wire Rods for General Engineering Purposes	
	Product Type/ Grade/Alloying	Cast Billet Ingots, Billets, Blooms of Grade, with/without microalloying	

ANNEXURE A
TO PRODUCT MANUAL FOR
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GROUPING GUIDELINES

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Grouping has been done on the basis of grades as under:

Group-1	Grade: 1,2
Group-2	Grade: 3, 4, 5, 6, 7, 8, 9, 10
Group-3	Grade :4M, 6M, 7M, 8M, 10M

- 1) One sample shall be drawn from each group as above for **chemical testing only**, to cover all the grades of the product within that group. The sample drawn from each group shall meet following criteria:
 - a) In case a manufacturer applies for GOL/Inclusion of more than one product type (Cast Billet Ingot, Billet, Bloom or slab) for the same Grade and Designation, separate samples from each product type for chemical test shall not be drawn.
 - b) In case applicant /licensee intend to cover designations in the group with micro-alloying the sample to be drawn, for independent testing from each group for chemical tests only as mentioned above, shall be with micro-alloying.
- 2) For testing of Dimensions, Microscopic defects, Shape for considering GOL, one sample of any size, grade, designation of each product type intends to be covered in the licence may be tested in the factory. Separate samples are not required to be tested for physical parameters for each size/grade/designation.

However, while considering inclusion of a new variety (product type/grade/designation), licensee shall submit factory test report for physical parameters if the physical parameters are different from the ones already tested.
- 3) If mutually agreed between purchaser and manufacturer for carrying out Sulphur print, inclusion content and macro-examination tests in case of cast billet ingots, separate samples for each size, irrespective of grade/designation may be drawn for testing in-house. In case no test facilities are available, details may be sought from the applicant with respect to the arrangement proposed for testing of optional requirements. In the absence of conducting these tests in-house and lack of other arrangements for testing, manufacturer shall submit an undertaking that no claim for conformity of the product to such requirements will be made.
- 4) While drawing samples for independent testing, applicable declaration as per Notes given under Table-1 of IS 8952:1995 may be obtained and reflected in the test request appropriately.
- 5) If the above sample passes, then licence may be granted/change in licence scope may be done for the grades of the Group. However, it shall be ensured that the firm is having all necessary manufacturing and testing facilities for the Grades/Product type of carbon Steel to be included in the licence.
- 6) During the operation of license, BO shall ensure that all Grades & Product types covered in the license are drawn for independent testing on rotation over a period of time.

ANNEXURE B
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LIST OF TEST EQUIPMENTS

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Major test equipment required to test as per requirements of Indian Standard.

Sl. No.	Test Equipment/Chemicals and Identification Numbers (Where applicable)	Tests Used in with Clause Reference
1.	<p>Instrumental methods Spectrometer: atomic-absorption spectrometry, inductively coupled plasma atomic emission, inductively coupled plasma mass spectrometry techniques, spark source optical emission spectrometry.</p> <p>Spectrophotometer</p>	<p>C,S,P,Mn,Si,Al, Microalloying elements content (7.1,7.2)</p> <p>Mn,S,P,Si</p>
2.	<p>Strohlein or Leco apparatus with all attachments Barometer with chart, Hot plate, Muffle furnace, Complete range of glass wares, measuring cylinders, Desiccator, porcelain boats or ceramic crucibles, Thermometer, Electronic Balance, Distilled Water, Hot air oven, Oxygen - 99.5 percent minimum purity, ether or acetone, Standard Reference Material (NML) with certificate</p> <p>Reagents for C: tin granules or pure iron fillings, acidulated water/brine water, methyl red, caustic potash</p> <p>Reagents for S: Ceramic boats/crucibles – desiccators, Fluxes -Low sulphur copper, tin or iron, Dilute hydrochloric acid, Starch Iodide solution, Potassium iodate</p>	<p>C& S -chemical method, alternative to instrumental method(7.1,7.2)</p>
3.	<p>Weighing balance, Heater/ Heating element along with energy regulator, Ice water bath, Vol Flask Cap – 1 litre, (Whatman) filter paper No. 040, Suction Filtration Facility, Filter paper pulp pad, Standard Reference Material (NML) with certificate</p> <p>Potassium Permanganate (KMnO₄), Sodium Nitrite (Na₂NO₃), Ammonium Molybdate [(NH₄)₂ Mo₂O₇], Ammonium Phosphate [(NH₄)₃ PO₄], Potassium Nitrate (K₂NO₃), Phenolphthalein Solution, Rectified spirit or methyl alcohol, Sodium Hydroxide (NaOH), Hydrofluoric Acid (HF), Perchloric Acid (HClO₄), Sulphurous Acid, Hydrobromic Acid (HBr), other chemicals and reagent as applicable</p>	<p>Phosphorus content- chemical method, alternative to instrumental method (7.1,7.2)</p>

4.	Hot plate, Conical flask Reagents: silver nitrate, ammonium persulphate sodium arsenite solution, Dilute Nitric Acid, Phosphoric Acid, Dilute Sulphuric Acid, Concentrated Nitric Acid, NaCl Solution, Permanganic acid	Manganese content- chemical method, alternative to instrumental method(7.1,7.2)
5.	Medium textured filter paper, Porcelain casserole, platinum crucible, filter paper pulp, hot plate, hot air oven, muffle furnace Reagents: Silver nitrate solution, concentrated nitric acid, concentrated sulphuric acid, Dilute Hydrochloric Acid, Dilute Sulphuric Acid, Perchloric Acid, Tartaric acid and hydrofluoric acid	Silicon content- chemical method, alternative to instrumental method(7.1,7.2)
6.	Direct control – inspection through naked eye or using a magnifier (VCM) at a magnification of 3 to 6 times. Indirect control using more sophisticated optical and optoelectronic apparatuses and devices. This covers endoscopes, periscopes and TV cameras.	Freedom from Defects (9)
7.	i) metal-saw cutting machine/ gas cutting equipment/abrasive cutting wheel ii) Machine grinding unit with metallographic polish paper No. 00, 000 for finer finish iii) Lathe/shaper iv) Cleaning Agent; v) Stiff Fibre Brush; vi) Hot plate; vii) Etching tank(Dish/tray of porcelain, corrosion resistant glass/ Heat resistant glass/ corrosion resistant alloys) resistant Container; and viii) Etching Reagents as per Table 1 of IS 11371 ix) Thermometer x) Stop Watch xi) Water Bath xii) alcohol	Macro-examination (10)
8.	i) Machine grinding unit ii) Lathe/shaper iii) Photo-sensitive paper/ flat film iv) Sulphuric Acid($\rho_{20} = 1.84$ g/ml) v) Sodium thiosulphate(hypo solution): 15-20% vi) Water Bath with Heater vii) Stop Watch viii) wad of wet cotton wool ix) Surface Roughness Tester(optional) x) Rubber roller	Sulphur Print Tests (10)
9.	Polishing Machine, Microscope with 100x magnification.	Inclusion Content(10)
10.	i) Measuring Tape; and ii) Vernier Caliper iii) flat bench	Dimensions(11) Tolerances(12)

Note: The above is an indicative list for the purpose of guidance only

ANNEXURE C
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SCHEME OF INSPECTION AND TESTING

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LABORATORY - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

1.1 The manufacturer shall prepare a calibration plan for the test equipments.

2. TEST RECORDS – The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. LABELLING, MARKING, PACKING –

The Standard Mark as given in the Schedule of the license and Licence Number (i.e. CM/L.....) shall be incorporated, and the marking and packing shall be done as per the provisions of the Indian Standard, provided always that the product thus marked and packed conforms to all the requirement of the specification.

4. CONTROL UNIT – For the purpose of this scheme all products representing same cast and grade which are manufactured under uniform conditions of production in the same place shall constitute a control unit. Products of different types(ingots/blooms/billets) shall be considered to be of separate control unit.

5. LEVELS OF CONTROL - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

5.1 All the production which conforms to the Indian Standards and covered by the licence should be marked with Standard Mark.

5.2 General requirements relating to the supply of material shall conform to IS 8910. Material shall be manufactured as per Cl 6 of IS 8952:1995.

6. TEST CERTIFICATE-For each consignment of BIS Certified material conforming to IS 8952:1995 there shall be a test certificate which shall contain the Standard Mark, the cast/Control Unit number and the corresponding test results (as given in Annexure-I enclosed)

7. REJECTIONS – Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016. Any rejected material which is potentially re-salable be sheared or cut or deformed in such a manner that it cannot be used for any other purpose except re-melting. A separate record shall be maintained giving information on quantity and cast number/coil number/control unit number, as applicable, relating to all such rejections/defective/sub-standard material of the production not conforming to the requirements of the Specification and the method of its disposal. Such material shall in no case be stored together with that conforming to the Specification. The Standard Mark (if already applied) on rejected material should be defaced.

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TABLE 1: LEVELS OF CONTROL

(1)				(2)	(3)		(4)
TEST DETAILS					LEVELS OF CONTROL		REMARKS
Clause	Requirements	Test Method		Test equipment requirement R: required (or) S: Sub-contracting permitted	No. of Samples	Frequency	
		Clause	Reference				
6	Chemical Composition i) Ladle Analysis	7.1, 7.1.1, 8.1 Table-1	IS 8952 & IS 228 (Various Parts)	R	One	Each Cast	
	ii) Product Analysis	7.2, 8.2, 8.2.1, 8.2.2, Table-1,2 & Fig-1	Or any established Chemical/ Instr. method	R	One	Each Cast	
9	Freedom from Defects	9.1, 9.2	IS 8952	R	Adequate inspection on each item to ensure free from defects		
10	Macro-examination	10	IS 8952 IS 11371	S	As mutually agreed to between manufacturer and purchaser.		
	Sulphur Print Tests	10	IS 8952 IS 12037	S			
	Inclusion Content	10	IS 8952 IS 4163	S			
11 & 12	Dimensions & Tolerances	11.1 to 11.4, 12, 12.1 to 12.3	IS 8952	R	Adequate inspection to ensure each item conforms to nominal dimensions as agreed between and tolerances as stipulated in the standard.		

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empaneled by the Bureau.

Note-2: The control unit and levels of control as decided by the Bureau are obligatory to which the licensee shall comply with.

ANNEXURE I

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(Para 6 of the Scheme of Inspection and Testing)

XYZ IRON AND STEEL COMPANY

(Registered office Address and works address)

**TEST CERTIFICATE FOR Steel Ingots, Blooms and Billets for Production of Mild Steel Wire Rods
for General Engineering Purposes**



TEST CERTIFICATE No. _____

DATE _____

To M/s _____

We certified that the material described below fully conforms to IS 8952:1995 Chemical composition and Physical properties of the product, as tested in accordance with the Scheme of Inspection and Testing contained in the BIS Certification Marks Licence No. CM/L _____ are as indicated below against each order No.

(PLEASE REFER TO IS 8952:1995 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order No. & Date	(Nom Size)	Control Unit No.	Grade	Tolerances	Qty in tonnes	CHEMICAL COMPOSITION						PHYSICAL PROPERTIES				Colour code	Remarks
						C %	S %	P %	Si %	Mn %	Al %	@Micro Alloying Elements %	#Inclusion Content	Freedom from defects	#Sulphur print test tests		

If agreed between

@ Micro-alloying element present should be indicated

REMARKS

WAGON NO.

TRUCK NO.

(It is suggested that size A4 paper be used for this test certificate)

FOR XYZ IRON AND STEEL COMPANY