



**PRODUCT MANUAL FOR
BRIGHT STEEL BARS
ACCORDING TO IS 9550 : 2001**

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 9550 : 2001
	Title	:	Bright Steel Bars- Specification
	No. of Amendments	:	2
2.	Sampling Guidelines:		
a)	Raw material	:	No specific requirement.
b)	Grouping guidelines	:	Please refer Annex – A
c)	Sample Size	:	For physical tests: 1 m For chemical tests : 1 m or 50 gm 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 : AI tests		
6.	Scope of the Licence :		
	"Licence is granted to use Standard Mark as per IS 9550 : 2001 with the following scope:		
	Name of the product	Bright Steel Bars	
	Finished Condition	Drawn/Turned/Ground/Turned and Reeled	
	Shape	Round/Hexagonal/Square/Flats	
	Dimensions and tolerance classes	For Round/Hexagonal/Square bars: Diameter or equivalent cross sectional areas from ... mm up to and including ... mm and tolerance classes :..... For Flats: Width from ... mm up to and including ... mm and tolerance classes:.....	

ANNEX A
Grouping Guidelines

A. Round/ Hex/Square Bars

Group 1: Sizes up to and including 10mm dia or equivalent cross sectional area

Group 2: Sizes over 10mm and upto and including 30mm dia or equivalent cross sectional area

Group 3: Sizes over 30mm and upto and including 50mm dia or equivalent cross sectional area

Group 4: Sizes over 50mm dia or equivalent cross sectional area

B. Flats

Group 1: Thickness up to and including 6 mm

Group 2: Thickness- above 6 mm to up to and including 30 mm

Group 3: Thickness- above 30 mm to up to and including 60 mm

Group 4: Thickness- above 60 mm

2. One sample of each supply condition (viz. drawn, turned, ground etc. as per Cl. 4.2 of IS 9550:2001) and of each shape (viz. Round, Hexagon, Square and flat) from each size group as mentioned at A above shall be tested to cover the size groups. In case sample of lower tolerance class is tested, higher tolerance classes may also be covered within the group. I.e. if sample of tolerance class h9 is tested then tolerance classes h10, h11, h12 may also be covered within the group.

3. It shall, however, be ensured that firm has necessary manufacturing and testing facilities for the entire range of sizes/classes proposed to be covered under the scope of BIS certification.

4. The scope of licence shall clearly indicate supply condition (cold drawn/ground/turned etc.) sizes, shape (round/hex/square/flats), for each grade of steel bars based on Manufacturing/Testing facilities.

5. During the operation of license, BO shall ensure that all sizes / grades covered in the license are drawn for independent testing on rotation over a period of time.

ANNX-B
List of Test Equipment

Major test equipment required to test as per the Indian Standard

Sl. No.	Tests used in with Clause Reference	Test Equipment
1	6, CHEMICAL COMPOSITION	<p>Instrumental method: Spectrometer/ Spectrophotometer.</p> <p>Chemical Method: For C,S 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 Reagents for C: tin granules or pure iron fillings, acidulated water/brine water, methyl red, caustic potash Reagents for S: Ceramic boats/crucibles – desiccators, Fluxes - Low sulphur copper, tin or iron, Dilute hydrochloric acid, Starch Iodide solution, Potassium iodate.</p> <p>For 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 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>For Mn- 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.</p> <p>For Si-- Medium textured filter paper, Porcelain casserole,</p>

		<p>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.</p> <p>For Cu- Plate, Muffle Furnace, porcelain or silica crucible, Reagents: Hot Wash Solution(dilute sulphuric acid solution 1 : 99 v/v with hydrogen sulphide), dilute sulphuric acid, hydrogen sulphide, Dilute Nitric Acid, Sodium Fluoride, solid, Dilute Ammonium Hydroxide, Acetic Acid, Potassium Iodide, Starch Solution, Sodium Thiosulphate Solution, Ammonium Bifluoride Solution.</p> <p>For Ni- Plate, Muffle Furnace, porcelain or silica crucible, Reagents: Hot Wash Solution(dilute sulphuric acid solution 1 : 99 v/v with hydrogen sulphide), dilute sulphuric acid, hydrogen sulphide, Dilute Nitric Acid, Sodium Fluoride, solid, Dilute Ammonium Hydroxide, Acetic Acid, Potassium Iodide, Starch Solution, Sodium Thiosulphate Solution, Ammonium Bifluoride Solution.</p> <p>For Cr- Hot plate, stop watch Reagents: dilute sulphuric acid and phosphoric acid mixture, concentrated nitric acid, ammonium persulphate, silver nitrate, dilute hydrochloric acid, ferrous ammonium sulphate, standard potassium permanganate solution.</p> <p>For N- Inert gas fusion followed by determination using thermal conductivity detector</p>
2	7, MECHANICAL PROPERTIES	UTM
3	8, DIMENSIONS AND TOLERANCES	Vernier Caliper, Height gauge, Micrometer, Steel Scale, Measuring Tape, Straight Edge, Feeler gauge,
4	9, SURFACE CONDITION/ Decarburization	Metallurgical/Optical microscope with image Analyser
5	11, OTHER TESTS	
	a. Hardenability	Rockwell or Vickers hardness tester and Queching arrangement
	b. Inclusion content	Metallurgical/ Optical microscope
	c. Grain size	Metallurgical/ Optical microscope
	d. Microstructure	Metallurgical/ Optical microscope
	e.. Crack testing	Ultrasonic Flaw Tester
	f. Microscopic examination for depth of defects;	Metallurgical/ Optical microscope

	g. Any other tests (that is, surface roughness in micron), etc.	Roughness Tester
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The above list is indicative only and may not be treated as exhaustive.

ANNEX C
TO PRODUCT MANUAL FOR
Bright Steel Bars
According to IS 9550:2001
SCHEME OF INSPECTION AND TESTING
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1. LABORATORY: A laboratory shall be maintained which shall be suitably equipped and staffed, where the tests shall be carried out in accordance with the methods given in the specification.

1.1 All testing apparatus/measuring instruments shall be periodically checked, verified and calibrated as appropriate and records of such checks/verification, calibration shall be maintained.

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

3. PACKING AND MARKING–The Standard Mark as given in Schedule of the license and Licence Number (i.e. CM/L.....) shall be stamped on each bar (if diameter or equivalent cross sectional area of the bar is < 50 mm it may be incorporated on the metal tag attached to each bundle).

3.1 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, bright steel bars of the same shape, dimensions, tolerance classes and in the same finished condition, manufactured from same cast/heat under identical conditions shall constitute a 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.

6. TEST CERTIFICATE- For each consignment of BIS Certified material conforming to IS:9550-2001, there shall be a test certificate which shall contain the Standard mark, cast number, size, dimensions, surface condition, decarburization and the corresponding test results (as given in Annexure I).

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.

TABLE 1 - LEVELS OF CONTROL

(1)				(2)		(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	No. of Sample	Levels of Control		
Cl.	Requirement	Test Method				Lot Size	Frequency	Remarks
		Clause	Reference					
6	Chemical Composition (Product Analysis)	6 & 10.1	IS 9550	S	1	Each Cast	Each Cast	Chemical Composition (product analysis) shall be carried out only if required by the purchaser. In all such cases, where product analysis is required by purchaser, at least one sample shall be taken from each cast for product analysis. No testing required if raw material is ISI marked.
7	Mechanical Properties	7 & 10.2	IS 9550 IS 3711	S	1	i) For Turned and Ground material- One for every 20 tonnes or part thereof with a minimum of one per cast. ii) For Annealed and Processed material- One for every batch (Not over 20 tonnes) with a minimum of one per cast. iii) For Cold drawn- One for every cast.		To be conducted only if required by purchaser

8	Dimensions & Tolerances	8.1 & 8.2, Table 1, 2, 3 & 4	IS 9550 IS 919 (Part2)	R	1	Every half an hour	Every half an hour	Bars, sections and flats shall be supplied as per the dimensions specified in the orders.
9	Surface Condition	9 Table 5	IS 9550	R	1	Each Bar	Each Bar	
	Decarburization	9.1 9.1.1 9.1.2 Table 5	IS 9550 IS 6396	R	1	Each Control Unit	Each Control Unit	1. No surface decarburization shall be permitted for turned and ground bars. 2. If a lower depth of decarburization is required, it shall be mutually agreed to between the purchaser and the manufacturer.
11	Other Tests: a) Hardenability b) Inclusion Content c) Grain Size d) Micro-structure e) Crack Testing f) Microscopic examination for depth of defects g) Surface Roughness	11.1	IS 9550 IS 3848 IS 4163 IS 4748 IS 7739(pt.1) IS 7739(pt.2) & IS 7739(pt.5) IS 2595, IS 3658 & IS 3664	S	1	As per the purchaser's requirement		1. To be conducted if required by purchaser. 2. Acceptance values and details of tests in absence of any Indian Standard shall be as agreed to between the purchaser and the manufacturer.
13	Surface protection and packing	13	IS 9550 IS 1153 IS 1154	R	Each and every piece			Material shall be suitably packed in bundles.

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 empanelled 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
TEST CERTIFICATE
(para 6 of the Scheme of Inspection and Testing)



XYZ IRON AND STEEL COMPANY

(Regd. Office Address and Works address _____)

TEST CERTIFICATE FOR BRIGHT STEEL BARS

TEST CERTIFICATE NO. _____ DATE. _____

To M/s _____

It is to certify that the material described below fully conforms to IS:9550-2001. Chemical composition, dimensions, decarburization and agreed mechanical properties of the product as tested in accordance with the Scheme of Testing and inspection contained in the BIS Certification Marks licence No. CM/L _____ are as indicated against each order No. etc.

(PLEASE REFER TO IS 9550:2001 FOR DETAILS OF SPECIFICATION & ACCEPTANCE CRITERIA AS AGREED BETWEEN US)

TEST RESULTS

Order No. & Date	Cast No.	Size	Finished Condition	Quantity	*Chemical Analysis						*Dimensions	Surface Condition	Decarburization	*Other Tests
					C %	S %	P %	Si %	Mn %	Al etc. %				

REMARKS

SHIPPING ADVICE NO. SIGNATURE: _____

WAGON NOS. Designation: _____

For XYZ IRON & STEEL COMPANY

*As agreed to between manufacturer and purchaser

(It is suggested that size A-4 PAPER 210 X 297 mm) be used for this Test Certificate)