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उत्पाद मैनुअल

स्टेनलेस इस्पात अर्ध-तैयार उत्पाद, छड़े, तार की

रॉड और चमकीले की छड़े

IS 6603: 2024 के अनुसार

PRODUCTMANUAL
FOR Stainless Steel Semi-Finished Products, Bars, Wire
Rods and Bright Bars
ACCORDING TO IS 6603: 2024

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity 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.

1.	मानक संख्या IS No.	:	IS 6603:2024
	शीर्षक Title	:	Stainless Steel Semi-Finished Products, Bars, Wire Rods and Bright Bars
	संशोधनों की संख्या No. of amendments	:	0
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	Steels used for the manufacturing of the product covered in the standard shall conform to the requirements of IS 14650. Note: This section indicates the requirements for raw material (if specified in the IS) for which compliance is to be established during Grant of Licence/Change in Scope of Licence/Factory Surveillance
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please refer to Annex-A
c)	नमूने का परिमाण Sample Quantity	:	For Chemical tests: i) For instrumental chemical analysis - 5 pieces of 5 cm length ii) For Mechanical tests, Inter granular Corrosion Test-Prepared test pieces for tensile test, impact test, hardness and Intergranular corrosion test (for larger

		diameter/thicknesses generally greater than 25 mm) or 1 pc of 1.5 m length (for smaller diameter/thicknesses generally less than 25 mm) The requirements of Depth of Acceptable Discontinuities Defects (as per cl.6.1 and Table 2) and Dimensions and Tolerances (as per cl.12) shall be carried out in the factory on full sizes of Bars, Wire Rods, Flats etc. Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (in case of market surveillance, effort may be made to procure the required quantity of product sample, as far as possible since raw material sample may not be available in market)
3.	परीक्षण उपकरणों की सूची List of Test Equipment	: Please refer to Annex-B
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	: Please refer to Annex-C
5.	एक दिन में संभावित परीक्षण Possible tests in a day	
	All except Corrosion Resistance (cl.14.) and Resistance to Intergranular Corrosion (Table 5,6,7) Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies (OSAs) during factory inspection to provide ready reference regarding the tests which can be witnessed during the inspection in the factory by The officer/auditor.	
6.	लाइसेंस का दायरा/Scope of the Licence:	
	"License is granted to use Standard Mark as per IS 6603:2024 with the following scope: IS 6603: 2024 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेंस निम्नलिखित कार्यक्षेत्र के लिए प्रदान किया जाता है	
	Name of the product	Stainless Steel Semi-Finished Products, Bars, Wire Rods and Bright Bars
	Grade/Numerical Symbol	Austenitic Steels: X15Cr18Ni8/301...., Ferritic Steels: X04Cr17/430....
	Condition of supply	Hot Rolled/Forged/Drawn, Cold Rolled/Forged/Drawn Polished, Turned,Ground,Turned and Ground
	Heat Treatment	Annealed , Quenched and Tempered, Solution Annealed, Precipitation Hardened
	Shape(Type)/Size	Round/Square/Hexagonal Bars of diameter/size frommm to up to and includingmm Square Edge / Round Edge Flats/Flat Bars of thickness frommm to up to and includingmm, width from....mm to up to and includingmm

		Wire Rods of Diameter frommm to up to and including ... mm Bright Bars of diameter frommm to up to and including mm
	Surface Finish	1U,1C,1G,1P,2H,2D,2B etc.

BUREAU OF INDIANSTANDARDS
MANAKBHAVAN, 9, BAHADUR SHAH ZAFAR MARG,
NEW DELHI-110002

ANNEX-A

GROUPING GUIDELINES

1) For the purpose of GoL/CSoL, the following Grouping Guidelines may be considered:

A) Grouping based upon phase of iron and chemical composition/alloying elements of Steel Designations:

Group	Steel Designation	Remarks
1	Austenitic Steels 301, 304L 303, 304LN 304Cu 303Cu 304N 304 321, 347 304LNi 305 204Cu 201 Cu, 202 202S1 X13Mn13Cr18N 310L 310 310S 314	One sample of any Steel Designation shall be drawn and tested.
2	Austenitic Steels with Mo- 316L 316Ti X02Cr17Ni12Mo3 X03Cr17Ni2Mo3 316LN 316LNi 317 X02Cr18Ni12Mo3N X02Cr17Ni13Mo4 312 X01Cr25Ni22Mo2 X01Cr24Ni22Mo4CuNW 326 345	One sample of any Steel Designation shall be drawn and tested .
3	Austenitic Steels with Ni as major alloying element- 904L 904LN X01Ni31Cr27Mo4Cu	One sample of any Steel Designation shall be drawn and tested.

4	Austenitic-Ferritic (Duplex Steels)- X02Cr22Ni2N 2101 2304 2205 2441 X03Cr27Ni5Mo2N X02Cr25Ni6Mo3CuN 2507 2760 X02Cr28Ni8Mo5CoN	One sample of any Steel Designation shall be drawn and tested.
5	Ferritic Steels- 409Nb 410S 430 430F 430Nb 439 434 X02Cr18Mo2TiS	One sample of any Steel Designation shall be drawn and tested.
6	Martensitic Steels- 410 416 420 420B 420C 431 430F 440C 420V 415 431N 434C	One sample of any Steel Designation shall be drawn and tested.
7	Precipitation-Hardening Steels- 630 X07Cr17Ni7Al	One sample of any Steel Designation shall be drawn and tested.

A.1 Evidence of manufacturing capability, such as Mill Test Certificates (MTCs) (of earlier consignments) , of all Steel Designations intended to be covered in the Licence within each Group, shall be submitted by the manufacturer and their conformity to the requirements of IS 6603:2024 shall be established before endorsing all steel designations in the Scope. In case of non-availability of MTCs (of earlier consignments), samples of all those Steel Designations shall also be drawn and tested from each Group.

B) Grouping based upon the Condition of Supply:

Condition of Supply	Grouping
Hot Rolled/Forged/Drawn	Separate Samples, in addition to A above, for each Condition shall be drawn and tested
Cold Rolled/Forged/Drawn	Separate Samples, in addition to A above, for each Condition shall be drawn and tested
Polished, Turned, Ground, Turned and Ground	Separate Samples, in addition to A above, for each Condition shall be drawn and tested

C) Grouping based upon Heat Treatment process:

Heat Treatment Process	Grouping
Annealed	Samples, drawn at A & B above, shall be such which cover all Heat Treatment processes intended to be covered in the scope of the licence
Quenched and Tempered	
Solution Annealed	
Precipitation Hardened	

D) Grouping based upon Shape(Type) and Size:

Shape(Type) and Size	Grouping
Round/Square/Hexagonal Bars, Flat Bars, Bright Bars	Samples, drawn at A,B&C above, shall be such which cover all types of Bars intended to be covered in the licence. Seperate Samples for each Size are not required to be drawn.
Wire Rods	Atleast one sample, drawn at A,B & C above, shall be of Wire Rods, if Wire Rods are intended to be covered in the licence. Seperate Samples for each Size are not required to be drawn.

2) Recommendation on Surface Finishes shall be restricted based upon the manufacturing facilities available with the firm.

3) Scope of licence shall be restricted based on the manufacturing and testing facilities available.

4) During operation of licence, samples of each variety covered in the scope of licence, shall be tested in rotation, to the extent possible

ANNEX-B
LIST OF TEST EQUIPMENTS
(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sr. No	Test Equipment/Chemicals	Tests Used in with Clause Reference
1	Preparation of specimen	Rough Polishing Machine, Abrasive Cutting Machine, Fine Polishing Machine, Grinding Machine, Molding machine, Longitudinal cutting machine
2	6.1 Surface Quality (Freedom from Defects)	Ultrasonic Tester, Magnetic Particle Inspection, Eddy Current Tester
3	7, 7.1, 7.2 for C, S, P, Mn, Si, V, Cu, Cr, Ni, Ti, Nb, Mo, W, Al	Instrumental methods Spectrometer: atomic-absorption spectrometry, inductively coupled plasma atomic emission, inductively coupled plasma mass spectrometry techniques, spark source optical emission spectrometry. Standard Reference Material with certificate
4	7, 7.1, 7.2 (Nitrogen content)	Inert gas fusion followed by determination using thermal conductivity detector
5	9.1, 9.2 (Tensile test)	Tensile Testing Machine
6	9.3 (Hardness Test)	Hardness Tester (Vickers/Brinell/Rockwell)
7	9.4 (Charpy Impact test)	Pendulum Impact Testing Machine – Charpy for U-notch specimen
8	12 (Dimensions and Dimensional Tolerances)	Vernier Calipers, Micrometer, Scale, Cord, Measuring Tape, Straight Edge, Flat bench
9	14.1 (Corrosion resistance)	Apparatus for corrosion resistance test BY HUEY TEST (IS 10461 (Part1):1994) Oven (0-700 Deg C), Stop Watch Corrosive Solution (Aqueous solution of 65+/-2% (m/m) reagent grade HNO ₃ , weigh balance, Hot Plate, Conical Flask (1 litre) fitted with cold finger immersion condenser or other type of condenser such as Allihn condenser with at least 4 bulbs, paper indicator to check acid fumes, test piece support Mechanical/chemical preparation and degreasing apparatus and reagents including Grade 120 Abrasive Paper or cloth, Hydrochloric Acid, Nitric Acid, soap, acetone, Water Apparatus for test specimen preparation

10	Resistance to Intergranular Corrosion (Table 5, 6 & 7) (refer ISO 3651-2)	Erlenmeyer flask, Support for the test piece, Heating device, copper (II) sulfate pentahydrate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$), sulfuric acid, ferric sulfate (III) [$\text{Fe}_2(\text{SO}_4)_3 \cdot x\text{H}_2\text{O}$], Mandrels of appropriate diameter, hydrochloric acid, nitric acid
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ANNEX C

SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that manufacturers (licensees/applicants) will implement a Quality Assurance Plan i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.4.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is: For the purpose of this Scheme, a control unit is defined as material of same grade, condition, shape (type) ,subjected to same heat treatment ,processed to same dimensions and manufactured from the same cast of raw material in one go.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**.

1.3.3. The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan. Alternatively, the manufacturer has the option of adherence to the quality plan as per levels of control recommended in column 3 of Table 1.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

2. ENSURING COMPLIANCE THROUGH TESTING- It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory.

2.1 For the guidance of manufacturers, Table 1 giving the recommended levels of control is given below. Column 2 of Table 1 indicates routine tests where test equipment is required in house as "R" or other tests which can be subcontracted as "S". Subcontracting is permitted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.2 For MSME manufacturers, the requirement of maintaining a laboratory/in-house testing facility for routine tests (indicated as "R" in Column 2 of Table 1) is also optional.

2.2.1 MSME manufacturers may utilize common cluster based facilities as per guidelines for the utilization of cluster based test facilities by MSMEs or the provisions of Sharing of testing facilities or get testing done from BIS recognized/empaneled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.3 Large Scale manufacturers shall maintain an in-house laboratory equipped at least with test facilities for routine tests (indicated as “R” in Column 2 of Table 1), where different tests given in the specification shall be carried out in accordance with the method given in the specification. They shall also implement a calibration plan for the in-house test equipment.

2.3.1 Alternatively, in lieu of an in-house laboratory, large scale manufacturers can also utilize the provisions of Sharing of testing facilities as per the Guidelines for Grant of Licence available on BIS website www.bis.gov.in. (Under Conformity Assessment>Product Certification Process). Even for subcontracted tests, provisions for sharing of testing facilities can be utilized.

2.4 TEST RECORDS- The manufacturers maintaining an in-house laboratory or utilizing common cluster based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on the product and on the test certificate provided always that the material so marked conforms to each requirement of the specification. Unless agreed otherwise, the material shall be marked as follows:

- a) Each bar and flat over 50 mm in diameter or width across flats shall be legibly stamped/stencilled/adhesive labels attached with cast number and the type of steel;
- b) Bars and flats up to and including 50 mm in diameter or width across flats shall be bundled together and a tag attached bearing the cast number and the type of steel; and
- c) Each coil of wire rod shall be legibly marked or tagged with manufacturer's name/trade mark, cast number and designation of steel.

4. TEST CERTIFICATE: For each consignment of BIS Certified material conforming to IS 6603:2024 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)

5. REJECTION - All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. 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
(ONLY FOR GUIDANCE PURPOSE)

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or)S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Methods			No. of Sample	Frequency	Remarks
		Clause	Reference				
5	Manufacture	5.1,5.1.1, 5.2 5.3 5.4	IS 6603:2024	R	Manufacturer shall exercise adequate in process controls to ensure that the product is manufactured as per the provisions of the standard. Steels used for manufacturing the product covered in the standard shall conform to the requirements of IS 14650.		
6	Freedom from Defects						
6.1	Surface Quality	Table 1, Table 2	IS 6603:2024	R	Firm to have adequate in-process controls to check compliance of this parameter as per the requirements given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity.		
6.2	Internal Soundness	---	IS 6603:2024	S	Requirements, together with the conditions for their verification, can be agreed upon at the time of enquiry and order		
7	Chemical Composition	Relevant Parts of IS 228 or Any other established International instrumental/chemical method.					

	Ladle Analysis	7.1 Table-3	IS 6603:2024	R	One	Each Heat	Applicable for primary stainless steel producers only.
	Check analysis	7.2 10.1 Table-3,4	IS 6603:2001	R	One	Each Cast	a)Applicable for Manufacturers, without steel making facilities and are procuring semi-finished products for further rolling/forging. Such manufacturers shall maintain records of test certificates for ladle analysis of each heat. b) No further testing if the raw material (semi-finished products) procured by such manufacturers are ISI marked and are received with Test Certificate.
9	Mechanical Properties	Mechanical properties for grades/sizes other than that mentioned in Table 5 to Table 9 or Table 15 to Table 19 shall be mutually agreed to between the purchaser and the supplier.					
	Proof Strength, Tensile Strength, Elongation after Fracture	9.1 10.2.1 to 10.2.4 Table 5 to Table 9 Table 15 to Table 19	IS 6603:2024 IS 1608 (Part 1)	R	One	Each Control Unit	---
	Tensile Properties at Elevated Temperature	9.2, 10.2.1 to 10.2.4, Table 10 to Table 14	IS 6603:2024 IS 1608 (Part 2)	S	----	----	For Guidance Purpose Only

	Hardness Test	9.3, 10.2.1 to 10.2.4, Table 6 to 9, Table 18,19	IS 6603:2024 IS 1500(Pt.1) IS 1501(Pt.1) IS 1586(Pt.1)	R	One	Each Control Unit ---
	Charpy Impact Test	9.4,10.2.1 to 10.2.4, Table 5,6,8,9, 15,16,18,19	IS 6603:2001 IS 1757 (Part 1)	S	----	----
12	Dimensional Tolerances	12, Table 9 to 17	IS 6603:2024	R	Firm to have adequate in-process controls to check compliance of this parameter as per the requirements given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity.	
14	Corrosion Resistance	14	IS 6603:2024 IS 10461 (Part 1) Any other method as agreed to between the manufacturer and purchaser	S	----	----
	Resistance to Intergranular Corrosion	14	IS 6603:2024 Tables 5,6,& 7	S	----	----
						If required by the purchaser, the material shall be tested for corrosion resistance as per IS 10461 (Part 1) or ISO 3651 (Part 2) or any other method as agreed to between the manufacturer and the purchaser
						If required by the purchaser, the material shall be tested for corrosion resistance as per IS 10461 (Part 1) or ISO 3651 (Part 2) or any other method as agreed to between the manufacturer and the purchaser

Annexure-I

XYZ IRON AND STEEL COMPANY
(Registered office Address and works address)
TEST CERTIFICATE FOR SPECIFICATION FOR
Stainless Steel Semi-finished products, Bars, Wire Rods and Bright Bars

TEST CERTIFICATE No. _____

To M/s _____

We certified that the material described below fully conforms to IS 6603:2024 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
LicenceNo.CM/L_____are as indicated below against each order No.

(PLEASE REFER TO IS 6603:2024 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Or der no and date	Size/ Shape /Type	Designation/ Condition	Heat Treatment	Quantity	Chemical Composition										Mechanical Properties					Corrosion tests#
					C	Si	Mn	P	S	Ni	Cr	Mo	Cu	Cr	N	Others	Proof Strength	Tensile Strength	Elongation after Fracture	Charpy Impact Test#

if required by purchaser
REMARKS
WAGON NO.
TRUCK NO.

FOR XYZ IRON AND STEEL COMPANY