



श्रतप्त शीर्षन/श्रतप्त बहिर्वेधन प्रयोग के लिये इस्पात
भाग 2 स्टेनलैस इस्पात – विशिष्टि
11169 Part 2:2023 के अनुसार

**PRODUCT MANUAL FOR
Steels for Cold Heading / Cold Extrusion Applications Part 2 Stainless Steels-specification
as per IS 11169 Part 2:2023**

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 11169 part 2:2023
	शीर्षक Title	:	Steels for Cold Heading / Cold Extrusion Applications Part 2 Stainless Steels-specification
	संशोधनों की संख्या No. of amendments	:	NIL
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	No specific raw material requirement 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 Annex – A

c)	नमूने का परिमाण Sample Quantity	:	For chemical tests: 5 pieces of 5 cm length For mechanical and metallographic tests: 1 piece of 2 m length The requirements of Shape, Dimensions and Tolerances as per cl.13. shall be carried out in the factory during FT as far as possible. 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 Annex – B
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer Annex –C
5.	एक दिन में संभावित परीक्षण Possible tests in a day	:	All tests are possible to be carried out in a day 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 readyreference 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:		
	Licence is granted to use Standard Mark as per IS 11169 Part 2:2023 with the following scope:		
	Name of the product	Steels for Cold Heading/Cold Extrusion Applications Part 2 Stainless Steels – Specification	
	Grade Designation	Austenitic Steels: X02Cr19Ni9,.... Austenitic Steels with Mo:X02Cr17Ni12 Mo2,...	
	Heat Treatment Condition at Delivery/Finished Condition (in case of Bright Bars/Drawn Flats)	+AT or AT+PE, +AT+C+AT+LC, or any Other Delivery Condition as agreed at the time of enquiry and order Drawn , Turned, Turned and Reeled, Ground (in case of Bright Bars/Drawn Flats)	

	Product Form/Type/Shape and Size	Wire Rods (Round, Square, Hexagonal) of Nominal Size fromxx mm to up to and including ...xx mm, Wires of Nominal Size from ...xx... mm toxx... mm Bars (Round, Square, Hexagonal) of Nominal Size fromxx mm to up to and including ...xx mm, Hot Rolled Flats of Thickness fromxx... mm to ...xx.... Mm, Width fromxx... mm to ...xx... mm, Hot Rolled Round Cornered Squares (RCS) Billets of Nominal Size fromxx... mm to ...xx... mm, Bright Bars (Round, Square, Hexagonal) of Nominal Size fromxx mm to up to and including ...xx mm, Bright Drawn Flats of Thickness fromxx... mm to ...xx.... Mm, Width fromxx... mm to ...xx... mm
	Any other aspect required as per standard	Including/Excluding Aptitude to Cold Forming

Annexure A

GROUPING GUIDELINES

- 1) IS 11169 Part 2:2023 covers the requirements for stainless steels intended for cold heading or cold extrusion and are delivered as wires, wire rods or bars.
- 2) These sections can be supplied in a combination of delivery conditions and product forms as given in Table -9 as agreed at the time of enquiry and order.
- 3) Mechanical Properties for each group of steels are specific to the delivery condition and the type of steel.
- 4) Shapes, Dimensions and Tolerances have been specified at cl.13 for Wire Rods/Bars/Wires. For Bright Steel Products, separate tolerances classes (h6 to h12) have been specified in accordance with IS 919 (part 2) with h6 being the most stringent tolerances class.
- 5) In view of above, the following Grouping Guidelines shall be considered for the purpose of GoL/CSoL:

a) Grouping based upon Grades/Designation:

Manufacturer shall declare the Grades/Designations of Stainless Steel intended to be covered in the scope of licence.

Group	Category and Designations	Grouping
1	Austenitic Steels: X10Cr18Ni8 X02Cr19Ni9 X04Cr18Ni9Cu X02Cr18Ni9Cu3 X02Cr18Ni8Cu X04Cr19Ni10 X04Cr18Ni10Ti X02Cr19Ni11 X04Cr18Ni11 X02Ni18Cr16	One sample of any Grade/ Designation shall be drawn and tested
2	Austenitic Steels with Mo: X02Cr17Ni12Mo2 X04Cr17Ni12Mo2 X04Cr17Ni12Mo2Ti X02Cr17Ni12Mo3 X03Cr17Ni12Mo3 X02Cr17Ni12Mo3N X02Cr17Ni11Cu3Mo2 X04Ni25Cr15Ti2Mo1VB	One sample of any Grade/ Designation shall be drawn and tested
3	Austenitic-ferritic steel: X02Cr22Ni5Mo3N	One sample of any Grade/ Designation shall be drawn and tested
4	Ferritic steels X04Cr17 X04Cr17Mo1	One sample of any Grade/ Designation shall be drawn and tested
5	Martensitic steel X12Cr13	One sample of any Grade/ Designation shall be drawn and tested

Evidence of manufacturing capability of all Grades/Designations such as Mill Test Certificates (of earlier consignments), intended to be covered in the scope of licence within each Group, shall be submitted by the manufacturer and their conformity to the requirements of IS 11169 (Part 2) shall be established before endorsing all Grades/Designations in the Scope of Licence. In case of non-availability of MTCs, samples of all those Grades/Designations shall also be drawn and tested within each Group.

b) Grouping based upon Heat Treatment Condition at Delivery/Finished Condition (in case of Bright Bars):

Manufacturer shall declare the Heat Treatment Condition at Delivery for all Grades/Designations of Stainless Steel intended to be covered in the scope of licence.

Heat Treatment Condition at Delivery	Symbol	Grouping
Solution annealed or solution annealed + peeled	+AT or AT + PE	Samples of Grades/Designations, drawn at a) above, shall be drawn in such combination so that samples of all Heat Treatment Condition at Delivery, intended to be covered in the scope of the licence, are tested.
Solution annealed + cold drawn	+AT + C	
Solution annealed+ cold drawn + solution annealed	+AT + C + AT	
Solution annealed + cold drawn +solution annealed + skin passed	+AT + C + AT + LC	
Soft annealed or soft annealed + peeled	+A or +A + PE	
Soft annealed +skin passed	+A +LC	
Soft annealed +cold drawn +soft annealed	+A + C + A	
Soft annealed + cold drawn + soft annealed +skin passed	+A + C + A + LC	
Others	Others Other delivery conditions may be agreed at the time of enquiry and order	

Finished Condition (in case of Bright Bars/Drawn Flats)	Grouping
Drawn	If Bright Bars/Drawn Flats are intended to be covered in the scope of licence, separate samples of Bright Bars/Drawn Flats shall be drawn in such combination so that samples of each Finished Condition are drawn and tested.
Turned	
Turned and Reeled	
Ground	

c) Grouping based upon Product Form/Shape and Size:

Product Form/Shape	Grouping
Bars (Round, Square, Hexagonal, Flat Bars, RCS Billets)	Samples, drawn at a) and b) above, shall be of any size and of any Product Form/Shape.
Wire Rods (Round, Square, Hexagonal, Rectangular)	
Bright Bars (Round, Square, Hexagonal), Drawn Flats	However, efforts shall be made to draw samples of all Product Forms/Shapes intended to be covered in the scope of licence.
Wires	Separate Samples for each Size are not required to be drawn and tested. However, scope of licence with regards to Sizes shall be restricted based upon manufacturing capability.

- 6) Scope of the licence shall be restricted based on the manufacturing and testing facilities available.
- 7) During the operation of the licence, samples of each variety covered in the scope of licence, shall be tested in rotation, to the extent possible.

ANNEXURE B

LIST OF TEST EQUIPMENT

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl. No.	Tests used in with Clause Reference	Test Equipment
1)	Chemical Composition, Ladle Analysis, Product Analysis, cl.7.1,cl.7.2	Device for instrumental chemical analysis such as Optical Spectrometer with all requisite channels, certified reference materials etc. OR Equipment, Apparatus and reagents as per as per the relevant parts of IS 228 in case of analysis as per IS 228
2)	Tensile Test, Cl 8.1, 8.1.1	Universal Testing Machine (UTM) as per IS 1608 (Part 1)
3)	Upsetting Test cl.10.1	Punch-Die arrangement with press for heading load
4)	Surface Quality Cl 11	Macro-etch test: Machine grinding unit with metallographic polish paper No. 00, 000 for finer finish, etchant (see Table-1 & 2 of IS 7739Pt.3), glycerin, photographic paper, 2 percent aqueous solution of sulphuric acid, hypo, ammonium molybdate (5g per 100 ml of water), nitric acid (r.d 1.2), developer-made up of 5 ml of saturated stannous chloride solution, 50 ml hydrochloric acid, 100 ml water and 1g alum, Caustic resistant filter paper, 5 percent caustic soda, 5 percent sodium sulphide solution, distilled water. Non-Destructive Tests: <u>Eddy Current Test:</u> Electronic Unit (Test Head with mounted probe), Signal Processing Circuitry, Audio visual alarms, Paint Marker, Strip Chart Recorder, Rotating Test Head <u>Magnetic Particle Test:</u> Magnetic Particle Test Setup, Bars of various diameters of solid copper, brass or aluminum rod, Rigid coil, Copper gauge faced C-Clamps, Heavy duty welding cables, Wooden Blocks, Jigs and Fixtures, Magnetic Field Indicators, Demagnetizer, White or Black Light source <u>Surface Defects:</u> Magnifying glass, Stereo Microscope, Acid Etching Chamber
5)	Shape, Dimensions and Tolerances, cl.13	i) Vernier Caliper ii) Measuring Tape iii) Ruler iv) Steel Scale v) Micrometer vi) Straight Edge

		vii) viii) Radius Gauge Cord
--	--	--

ANNEXURE 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: steel wires/wire rods/bars manufactured from same cast/heat having same dimensions and processed to same delivery condition under uniform conditions of production on the same line.

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/empaneled 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 legibly marked on tag attached to each package of bars, coil of wire rods/wires provided always that steels so marked conform to requirements of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

4. TEST CERTIFICATE- For each consignment of BIS Certified material conforming to IS 11169 Part 2:2023 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 Clause Reference		No. of Sample	Frequency	Remarks
7.1	Ladle Analysis	IS 228 or any other established instrumental /chemical methods	R	One	Each Heat	Applicable for primary producers only
7.2 9.1	Product analysis	IS 228 or any other established instrumental /chemical methods IS/ISO 14284	R	1) NIL 2) One	1) NIL 2) Each Cast	1) Applicable for primary producers only 2) For manufacturers other than primary producers. No further testing is required if the material procured is ISI marked and received with test certificate.
8	Mechanical properties	IS 11169 (Part 2) IS 1608 (Part 1) IS 3711	R	One	Each Control unit	
10	Aptitude to Cold Forming i) Upsetting Test	IS 11169 (Part 2)	S	---	----	If agreed at the time of enquiry and order
11	Surface Quality					
11.1.1 11.1.2	Internal Soundness	IS 11169 (Part 2) IS 11371	R	Firm shall exercise adequate in-process controls to ensure that the material remains free from harmful internal/microscopic defects. A macroetch test as per IS 11371 shall be performed to ensure freedom from such defects		

11.1.3	Non-Destructive Test	IS 11169 (Part 2)	S	As and if agreed at the time of enquiry and order The bars, wire rods and wires may be normally subjected to any non-destructive test capable of revealing all the surface defects which would lead to rejection of the material on the basis of mutually agreed standard of acceptance
11.1.4,11.2,11.3, 11.4,11.5	Surface Defects	IS 11169 (Part 2) Table 2 ,3,4	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.
13.1	Shape, Dimensions and Tolerances (Bars/Wire Rods/Wire)	IS 11169 (Part 2) IS 3739 IS/ISO 16124	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
13.2	Shape, Dimensions and Tolerances (Bright Products)	IS 11169 (Part 2) IS 919 (Part 2)	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

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 11169 (Part 2):2023 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 11169 (Part 2):2023 FOR DETAILS OF SPECIFICATION REQUIREMENTS)
TEST RESULTS

Order no and date	Size/ Shape /Type	Designation/ Condition	Heat Treatment	Quantity	Chemical Composition										Mechanical Properties		Aptitude to Cold Upsetting#	Surface Quality
					C	Si	Mn	P	S	Ni	Cr	Mo	Cu	Cr	N	Others		

if required by purchaser

REMARKS
WAGON NO.
TRUCK NO.

FOR XYZ IRON AND STEEL COMPANY