



उत्पाद मैनुअल
स्टेनलैस इस्पात के तार
IS 6528:2024 के अनुसार

**PRODUCT MANUAL FOR
Stainless Steel Wire
According to IS 6528:2024**

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 6528:2024
	शीर्षक Title	:	Stainless Steel Wire
	संशोधनों की संख्या No. of amendments	:	0
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	No specific requirement for raw material 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	:	1, For chemical tests: i) For instrumental chemical analysis - 5 pieces of 5 cm ii) For mechanical tests- 2 pcs of 500mm length 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)
d)	परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर Parameters to be Declared in Test Request		1) Steel Designation (Grade/Numerical Symbol) 2) Condition of Supply 3) Shape /Size 4) With or Without Optional Requirements of Reverse Bend Test (cl.10.2), Torsion test (Cl.10.3.), Wrapping Test (cl.10.4), Corrosion Resistance (cl.15.) Note: Apart from the above, any other requirements/parameters may also be declared as per the standard, as applicable.
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 except Corrosion Resistance tests. 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:		
	Licence is granted to use Standard Mark as per IS 6528:2024 with the following scope:		
	Name of the product	Stainless Steel Wire	
	Steel designation (Grade/Numerical Symbol)	X02Cr19Ni10 (304L), X02Cr23Ni4N (2304).....	
	Condition of supply	+ A (Annealed), +AT (Solution Annealed), + C (Cold Drawn)	
	Size/Shape/Type	Round wires of Diameter fromxx...mm to up to and includingxx... mm Square, Hexagonal and Octagonal Wires of Size (Distance across Flats) fromxx...mm to up to and includingxx... mm Flat Wires of Thickness fromxx...mm to up to and includingxx... mm, Width from fromxx...mm to up to and includingxx... mm Wire for Which the Final Operation is Surface Treatment for the purpose of Removing Scale or Drawing Lubricant of size fromxx...mm to up to and includingxx... mm Any other shape of wire of size fromxx...mm to up to and includingxx... mm	

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

ANNEXURE A

GROUPING GUIDELINES

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

a) **Grouping based upon Steel Designation (Grade/Numerical Symbol):**

i) Manufacturer shall declare the Stainless Steel Designations intended to be covered in the Scope of Licence

Group	Steel Designations (Grade/Numerical Symbol)	Grouping
1	Austenitic steels: 301 304L 303 304LN 304Cu 303Cu 304N 304 321 347 304LNi 305 308 204Cu 201Cu 202 201 202S1 X13Mn13Cr18N 309 310L 310LN 310 310S 314	One sample of any Steel Designation shall be drawn and tested to cover all Steel Designations within the group (Also See a(ii))
2	Austenitic Steels with Mo: 316L 316 316Ti 316Cu X02Cr17Ni12Mo3 X03Cr17Ni12Mo3 316LN 316LNi 317 X02Cr18Ni12Mo3N X02Cr17Ni13Mo4 312 X01Cr25Ni22Mo2	One sample of any Steel Designation shall be drawn and tested to cover all Steel Designations within the group (Also See a(ii))

	X01Cr24Ni22Mo4CuNW 326 345	
3	Austenitic Steels with Ni as major alloying element: 904L 904LN X8NiCrAlTi32-21 X01Ni31Cr27Mo4Cu	One sample of any Steel Designation shall be drawn and tested to cover all Steel Designations within the group (Also See a(ii))
4	Austenitic-ferritic steels (Duplex): X02Cr22Ni2N 2101 2304 2205 X02Cr21Mn5Ni3MoN 2441 X03Cr27Ni5Mo2N X02Cr25Ni6Mo3CuN 2507 2760	One sample of any Steel Designation shall be drawn and tested to cover all Steel Designations within the group (Also See a(ii))
5	Ferritic Steels: 409Nb X04Cr13 410S 410L 430 430F 430Nb 439 434 446 X02Cr18Mo2TiS	One sample of any Steel Designation shall be drawn and tested to cover all Steel Designations within the group (Also See a(ii))
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 to cover all Steel Designations within the group (Also See a(ii))
7	Precipitation Hardening Steels: 630 631	One sample of any Steel Designation shall be drawn and tested to cover all Steel Designations within the group (Also See a(ii))

- ii) Evidence of manufacturing capability, in the form of Mill Test Certificates (MTCs) etc., 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 IS 6528:2024 shall be ensured before endorsing all Steel Designations in the Scope of Licence. In case of non-availability of MTCs, samples of all those Steel Designations shall also be drawn and tested.

b) Grouping based upon Conditions of Supply:

- i) Manufacturer shall declare the Conditions of Supply of Wires in which each of the Steel Designations are intended to be supplied in.

Conditions of Supply	Grouping
+ A (Annealed)	Samples drawn for different Grade Designations from different Groups , as at a) above, shall be drawn in such a way (combination) so that samples of Steel Designations having the minimum and maximum Tensile Strength (as specified at Table 7) are tested.
+AT (Solution Annealed)	

- ii) For Steel Designations to be supplied in the Cold Drawn/Hard-Drawn Condition, manufacturer shall declare the Tensile Levels/Tensile Strength Range for each of the Steel Designations intended to be supplied within each Group.

Conditions of Supply	Grouping
+ C (Cold Drawn)	Samples drawn for different Grade Designations from different Groups , as at a) above , shall be drawn in such a way (combination) so that samples of Steel Designations having the lowest and highest Tensile Strength Levels are tested.

c) Grouping based upon Size/Shape:

Size/Shape	Grouping
Round Wires	Samples drawn of different Steel Designations and different Conditions of Supply/Tensile Strength Levels , as at a) and b) above, shall be drawn in such a way (combination) so that all samples of all Shapes of Wires, intended to be covered in the Scope of Licence, are tested.
Square, Hexagonal and Octagonal Wires	
Flat Wires	
Wire for Which the Final Operation is Surface	

Treatment for the purpose of Removing Scale or Drawing Lubricant	Samples drawn for each Shape may be of any Size. However, while drawing samples of different Conditions of Supply (Also refer b) Grouping based upon Conditions of Supply), samples of all requisite sizes of wires ,as per the corresponding Tensile Strength Level/Range, shall be drawn.
Any other Shape of Wire	

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

ANNEXURE B
LIST OF TESTING EQUIPMENT

(INDICATIVE LIST, FOR GUIDANCE ONLY)

S.no	Tests Used Clause Reference	Test Equipment/Chemicals
1	Chemical Composition as per CI 7	Device for instrumental chemical analysis such as Optical Spectrometer with all requisite channels OR • Carbon Sulphur (Strohlein's type) Apparatus – Complete set consisting of glass parts, combustion furnace, oxygen cylinder , combustion tubes/ boats etc. • Porcelain boat (capable of withstanding 1150 deg. C) • Weighing Balance • Hot plate • Muffle furnace • Induction Furnace • Barometer, Thermometer • Burette, Pipette and Full Range of Lab. Glassware like : Conical Flasks ,Beakers, Funnel, Pipettes Glass rod, watch Glass, Brush etc. • Standard Reference Material • Platinum Crucible for Silicon Test • Dessicator • Filter paper, Whatman Filter Paper & Ash less clippings • Arrangements for nitrogen testing • Drilling machine Chemicals and reagents as applicable (Indicative element wise list of test apparatus, chemicals and reagents is enclosed)
2	Tensile Test(CI 10.1)	Tensile Testing Machine with Strain Rate/Stress Rate Control with Extensometer
3	Reverse Bend Test (CI 10.2)	Bend Testing Machine
4	Torsion Test(CI 10.3)	Torsion Testing Machine
5	Wrapping Test(CI 10.4)	Wrapping Testing Machine
6	Dimension as per CI 10.1)	Vernier Calipers, Micrometer, Steel Scale, Measuring Tape

7	Corrosion Resistance as per Cl.15	Apparatus for corrosion resistance test <u>BY HUEY TEST (IS 10461 (Part1):1994)</u> Oven (0-700Deg C), Stop Watch Corrosive Solution (Aqueous solution of 65+/-2% (m/m) reagent grade HNO₃, 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 <u>By Money Penny Strauss Test (IS 10461 (Part2):1994)</u> Single use corrosive solution prepared by dissolving 100 g of copper sulphate pentahydrate in 700 ml of distilled water. Then add 184 g (100ml) of sulphuric acid and made up to 1000 ml with distilled water Conical flask of one litre fitted with four ball rising condenser weigh balance, Hot Plate, test piece support, copper filings Mechanical/chemical preparation and degreasing apparatus and reagents including Grade 120 Abrasive Paper or cloth, Hydrochloric Acid, Nitric Acid, Trichloroethylene or any other suitable solvent Apparatus for bend test, flattening test
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ANNEXURE B

LIST OF TESTING EQUIPMENT

INDICATIVE LIST OF TEST APPARATUS, CHEMICALS AND REAGENTS FOR CHEMICAL ANALYSIS THROUGH CHEMICAL METHODS AS PER IS 228

1.	Cl.7.1, 7.2 – C & S (chemical method, alternative to instrumental method)	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
2.	Phosphorus content Cl 7.1,7.2 (chemical method, alternative to instrumental method)	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
3.	Manganese content Cl 7.1,7.2 (chemical method, alternative to instrumental method)	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

4.	Silicon content CI 7.1,7.2 (chemical method, alternative to instrumental method)	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
5.	Cu content CI 7.3 (chemical method, alternative to instrumental method)	Plate, Muffle Furnace, porcelain or silica crucible, Reagents: HotWash 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
6.	Ni content CI 7.1,7.2 (chemical method, alternative to instrumental method)	ashless paper pulp, paper pulp pad, hot plate, dessicator, Reagents: ammonium nitrate, methyl red, dilute ammonium hydroxide, Concentrated hydrochloric acid Concentrated nitric acid, Perchloric acid, Hydrofluoric Acid
7.	Cr content CI 7.1,7.2 (chemical method, alternative to instrumental method)	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.

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 , Stainless Steel Wires of the same Steel Designation, same Condition of Supply, same shape and size and produced from the same cast of raw material on the same line in one go constitute a control unit.

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 Schedule of the license and Licence Number (i.e. CM/L...) shall be incorporated on each coil or bundle of wires and on the Test Certificate issued for each consignment, provided always that the product thus marked conforms to all the requirements of the specification. In addition, details of BIS website shall be marked as follows: “For details of BIS certification please visit www.bis.gov.in”

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 6528:2024, there shall be a test certificate which shall contain the Standard Mark, the lot/cast 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.

							wire rods procured are ISI marked and are received with Test Certificate, no further testing is required.
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9	Dimensional Tolerances	Table 3 to Table 6	IS 6528	R	Firm to have adequate in-process controls to check compliance of this parameter as per the requirements given in the Indian Standard. Wherever required, appropriate records shall be maintained by the manufacturer for evidence of conformity.	Unless otherwise agreed, dimensional tolerances for steels shall be as given in Table 3 to Table 6. Also, the purchaser may specify restricted tolerance (R) instead of normal tolerance (N) given in Table 3. For other shaped or sized wires, for which tolerances are not covered in Table 4 to Table 6, the tolerances shall be agreed upon at the time of ordering. The cross section shall be perpendicular to the longitudinal wire axis. The out-of-roundness shall not exceed half the total diameter tolerance specified for round wires. Length tolerances shall be mutually agreed to between the manufacturer and the purchaser.
10	Mechanical Properties					

10.1,1 0.1.1, 10.1.2	Tensile test: a) Tensile Strength b) Percentage Elongation	Table 7, Table 8	IS 1608 (Part 1)	R	One	Each Control Unit	Tensile properties for grades/sizes other than that mentioned in Table 7 shall be mutually agreed to between the purchaser and the supplier. Properties for non-round wire to be agreed upon at the time of ordering. As the mechanical properties of hard-drawn wire given in Table 8 will depend on the degree of work hardening, the specific type of steel, and the processing of the material and not that all the tensile strength levels can be achieved for all grades, the required tensile-strength level as per Table 8 shall be agreed between the manufacturer and the purchaser at the time of ordering.
10.2	Reverse Bend Test	10.2	IS 6528 IS 1716	S	----	----	If required by the purchaser, reverse bend test for steel wire shall be carried out in accordance with IS 1716.
10.3	Torsion Test	10.3	IS 6528 IS 1717	S	----	----	If required by the purchaser, torsion test shall be carried out in accordance with IS 1717.

10.4	Wrapping Test	10.4	IS 6528 IS 1755	S	----	----	If required by the purchaser, the wrapping test shall be carried out in accordance with IS 1755.
13	Conditions of Supply	Table 7, Table 8	IS 6528	R	Firm to have adequate in-process controls to ensure that the material is supplied in the Condition as specified in the Order.		The stainless steel wire may be supplied in any one of the conditions (+A), (+AT) or (+C) as per the tensile strength levels given in Table 7 and Table 8.
14	Finish	14.1 14.2 14.3 Table 6	IS 6528	R	Firm to have adequate in-process controls to ensure that the material is supplied in the Finish as specified in the Order.		----
15	Corrosion Resistance	---	IS 10461 (Part 1) IS 10461 (Part 2)	S	----	-----	If required by the purchaser, the material shall be tested for corrosion resistance in accordance with IS 10461 (Part 1) and IS 10461 (Part 2) or any other method as agreed to between the manufacturer and the purchaser.

ANNEXURE I
TO SCHEME OF INSPECTION AND TESTING TEST CERTIFICATE FORMAT
XYZ IRON AND STEEL COMPANY
TEST CERTIFICATE FOR Stainless Steel Wire According to IS 6528:2024

TEST CERTIFICATE NO. _____ DATED _____
TO M/s _____

It is certified that the material described below fully conforms to IS 6528:2024. Chemical composition of the product, as tested in accordance with the Scheme of Inspection and Testing contained in the BIS Certification Marks Licence No. CM/Lare as indicated below against each order no. etc.

(PLEASE REFER TO IS 6528:1995 FOR DETAILS OF SPECIFICATION REQUIREMENTS) TEST RESULTS

The material supplied conforms to specified tolerances REMARKS
SHIPPING ADVICE NO.
WAGON NOS.

FOR XYZ IRON AND STEEL COMPANY
(It is suggested that size A-4 paper be used for this test certificate)