PRODUCT MANUAL FOR
Stainless Steel Wire Rods
According to IS 6527:1995

1.	**Product**	**:**	**IS 6527:1995**
	Title	**:**	**Stainless Steel Wire Rods**
	No. of amendments	**:**	**1**
2.	**Sampling Guidelines**		
a)	**Raw material**	**:**	**No specific requirement for raw material**
b)	**Grouping Guidelines**	**:**	Please refer Annex - A
c)	**Sample Size**	**:**	1, For chemical tests: i) For instrumental chemical analysis - 5 pieces of 5 cm ii) For Wet Chemical analysis- 50 gm drillings 2, For mechanical tests- 2 nos x 500mm
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**	**:**	All except Corrosion Resistance tests
6.	**Scope of the Licence :**		
	Licence is granted to use Standard Mark as per IS 6527:1995 with the following scope:		
	Name of the product	Stainless Steel Wire Rod	
	Grade designation	X04Cr13, X12Cr13 etc..	
	Condition of delivery	Hot rolled, Annealed etc.	
	Size	Diameter from… to … mm	

ANNEXURE A
TO PRODUCT MANUAL FOR
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GROUPING GUIDELINES

Grouping of different grade designations of stainless steel has been done on the basis of phase of iron and chemical composition/alloying elements. Guidelines for drawing of samples for each group are as under:

Group	Grade Designation	Remarks
1	X04Cr13 Ferrritic	Two samples (Minimum diameter and Maximum diameter) each from the group, of any one of the grade designations, of Stainless Steel Wire Rod, as applied for licence/inclusion may be drawn and to be tested for all requirements of the specification applicable to the variety tested.
2	X12Cr13 X20Cr13 X30Cr13 Martensitic	Two samples(Minimum diameter and Maximum diameter) each from the group, of any one of the grade designations, of Stainless Steel Wire Rod, as applied for licence/inclusion may be drawn and to be tested for all requirements of the specification applicable to the variety tested
3	X02Cr18Ni11 X04Cr18Ni10 X08Cr18Ni9 X04Cr17Ni12Mo2 X02Cr17Ni12Mo2 X10Cr17Mn6Ni4 Austenitic	Two samples(Minimum diameter and Maximum diameter) each from the group, of any one of the grade designations, of Stainless Steel Wire Rod, as applied for licence/inclusion may be drawn and to be tested for all requirements of the specification applicable to the variety tested

1. A declaration shall be obtained from the applicant on each heat treatment process, based on the manufacturing capabilities, exercised for each group.
2. If the above sample passes, then licence may be granted/inclusion be done for the Grades designations, for all sizes and varieties of the Group. However, it shall be ensured that the firm is having all the necessary manufacturing and testing facilities for the manufacture and testing of the sizes/grade designations /varieties of Stainless Steel Wire Rod to be included in the licence.
3. During the operation of license, BO shall ensure that all the sizes/grade designations/ varieties covered in the license are drawn for independent testing on rotation over a period of time.

ANNEXURE B
TO PRODUCT MANUAL FOR
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LIST OF TESTING EQUIPMENT

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

S.no	Test Equipment/Chemicals	Tests Used Clause Reference
1	**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, chemcials and reagents is enclosed)**	Chemical Composition as per Cl 7
2	Tensile Testing Machine	Tensile Test as per Cl 9.1
3	Hardness Tester (Vickers/Brinell/Rockwell)	Hardness as per Cl 9.2
4	Vernier Calipers, Micrometer, Steel Scale, Measuring Tape	Dimension as per Cl 10

5	**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 Moneypenny 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, Tricholoroethylene or any other suitable solvent Apparatus for bend test, flattening test	Corrosion Resistance as per Cl.13

ANNEXURE B
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LIST OF TESTING EQUIPMENT

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

1.	Strohlein or Leco apparatus with all attachments Barometer with chart, Hot plate, Muffle furnace, Complete range of glass wares, measuringcylinders, 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 certificateReagents for C: tin granules or pure iron fillings, acidulated water/brine water, methyl red, caustic potashReagents for S: Ceramic boats/crucibles – desiccators, Fluxes -Low sulphur copper, tin or iron, Dilute hydrochloric acid, Starch Iodide solution, Potassium iodate	Cl.7.1, 7.2 – C & S (chemical method, alternative to instrumental method)
2.	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 ($KMnO_4$), Sodium Nitrite (Na_2NO_3), Ammonium Molybdate [$(NH_4)_2 Mo_2O_7$], Ammonium Phosphate [$(NH_4)_3 PO_4$], Potassium Nitrate (K_2NO_3), Phenolphthalein Solution, Rectified spirit or methyl alcohol, Sodium Hydroxide (NaOH), Hydrofluoric Acid (HF), Perchloric Acid ($HClO_4$), Sulphurous Acid, ,Hydrobromic Acid (HBr) , other chemicals and reagent as applicable	Phosphorus content Cl 7.1,7.2 (chemical method, alternative to instrumental method)
3.	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 Cl 7.1,7.2 (chemical method, alternative to instrumental method)

4.	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,	Silicon content Cl 7.1,7.2 (chemical method, alternative to instrumental method)
	concentrated sulphuric acid, Dilute Hydrochloric Acid, Dilute Sulphuric Acid, Perchloric Acid, Tartaric acid and hydroflouric acid	
5.	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	Cu content Cl 7.3 (chemical method, alternative to instrumental method)
6.	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	Ni content Cl 7.1,7.2 (chemical method, alternative to instrumental method)
7.	Hot plate, stop watch Reagents: dilute sulphuric acid and phosphoricacid mixture, concentrated nitric acid, ammonium persulphate , silver nitrate, dilute hydrochloric acid, ferrous ammonium sulphate, standard potassium permanganate solution.	Cr content Cl 7.1,7.2 (chemical method, alternative to instrumental method)

Note:

1. This is an indicative list for the purpose of guidance only and may not be taken as exhaustive
2. In case of Test method as per IS 228 is followed, facility/alternate arrangement for Al(in case of Al-killed), Nitrogen testing and Microalloying elements to be verified, accordingly scope of licence to be defined.

ANNEXURE C
TO ANNEXURE C
TO PRODUCT MANUAL FOR
Stainless Steel Wire Rod According to IS 6527:1995

SCHEME OF INSPECTION AND TESTING

1. 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 equipment.

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

3 **LABELLING AND MARKING** : The Standard Mark as given in Schedule of the license and Licence Number (i.e. CM/L…….) shall be incorporated on each package/bundle of the product, and the marking shall be done as per the provisions of the Indian Standard, 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"

4 **CONTROL UNIT** For the purpose of this scheme the material or part thereof representing the same cast, condition and form processed to same diameter shall constitute a control unit.

5 **LEVELS OF CONTROL** - The test and inspection indicated in Table 1 attached and at the levels of control specified therein shall be carried out on the whole production covered under this scheme and appropriate records maintained in accordance with paragraph 2 above..

6. **TEST CERTIFICATE**-For each consignment of BIS Certified material conforming to this specification 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).

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.

TABLE 1
LEVELS OF CONTROL
(PARA 5 OF THE SCHEME OF INSPECTION AND TESTING)

(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				
6	Freedom from Defects	6	IS 6527:1995	R	Each wire rod	Each wire rod	If found defective, item shall be rejected and not be marked.
7	Chemical Composition	IS 228 or any other established instrumental/chemical method		R			
	Ladle Analysis	7.1,	IS 6527:1995	R	One	Each Heat	Applicable for primary stainless steel producers only
	Product analysis	7.2	IS 6527:1995	R	-	Each cast	For primary steel producers, if required by the purchaser. Refer Cl.11.1, Cl 12.1 of IS 6527:1995
				R	One	Each Cast	For re-rollers, in case of material procured from primary producers of stainless steel, no further testing is required if the material is ISI marked and received with test

							certificate.
9	Mechanical Properties						
9.1	Tensile test: a)0.2 Percent proof Stress b) Tensile Strength c) Percentage Elongation	9.1	IS 1608 (Part 1)	R	*One	Each Control unit	*Refer Cl.11.2, Cl.12.2 of IS 6527:1995
9.2	Hardness	9.2	IS 1500	R	*One	Each Control Unit	*Refer Cl.11.2, Cl.12.2 of IS 6527:1995
10	Dimensional Tolerances	10.1	IS 6527:1995	R	Adequate inspection to ensure each item to be within the limits of specification.		
13	Corrosion Resistance		IS 10461 (Part 1 and 2)	R	Refer Cl.11 of IS 6911:2017		The material shall be tested for corrosion resistance if and as required by the purchaser.

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 TO SCHEME OF INSPECTION AND TESTING
TEST CERTIFICATE FORMAT

XYZ IRON AND STEEL COMPANY

TEST CERTIFICATE FOR Stainless Steel Wire Rod According to IS 6527:1995

TEST CERTIFICATE NO. _____ DATED_____
TO M/s_____

It is certified that the material described below fully conforms to IS 6527:1995. 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/L_____ are as indicated below against each order no. etc.

(PLEASE REFER TO IS 6527:1995 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order no and date	Size	Designation/Condition of delivery	Cast No/heat No.	Quantity (in tonnes)	Chemical Analysis (in %)												Mechanical Properties				Corrosion tests/Other tests/Remarks
					C	Si	Mn	P	S	Ni	Cr	Mo	Cu	Cr	N	Others	Hardness	YS (Mpa)	TS (Mpa)	Elongation (%) Bend	

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)