



उत्पाद मैनुअल
सामान्य इंजीनियरी अनुप्रयोगों के लिए मृदु इस्पात की तार
IS 280: 2006 के अनुसार

Product Manual for
Mild Steel Wire for General Engineering Purposes
According to IS 280: 2006

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.	भारतीय मानक संख्या IS No.	:	IS 280:2006
	शीर्षक Title	:	Mild Steel Wire for General Engineering Purposes
	संशोधनों की संख्या No. of amendments	:	02
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	Wires shall be drawn from Wire rods conforming to IS 7887 or any other specifications which meet the requirements of IS 7887. 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 mechanical test: 10 meters For chemical test: 5 meters 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	:	Size, Condition, Finish, Coating Class 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 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 Tests can 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 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: IS 280:2006 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेंस निम्नलिखित कार्यक्षेत्र के लिए प्रदान किया जाता है □Licence is granted to use Standard Mark as per IS 280:2006 with the following scope:		
7.	उत्पाद का नाम Name of the product		Mild Steel Wire for General Engineering Purposes
	Size		0.125 mm to 12.5mm Diameter
	Condition		Annealed,...
	Finish		Galvanized,..
	Coating Class		A, AB, B, C, D

ANNEX-A
TO PRODUCT MANUAL FOR
Mild Steel Wire for General Engineering Purposes
According to IS 280:2023

GROUPING GUIDELINES

Mild Steel Wire for General Engineering Purposes according to IS 280:2006 are designated as per the following:

- Diameter from 0.125mm to 12.5mm (Cl 7)
- Condition (Cl 9.1)
- Finish (Cl 10)
- Coating Class (Cl 11.1)

1. Samples to be drawn for independent testing are as under:

i) For Size (Cl-7):- For covering wires of all sizes in the range, samples of lowest and highest sizes of wires intended to be covered under the scope of licence is to be drawn and tested.

ii) For Finish (Cl-10):- For covering finishes for coated wires such as galvanized, Zn-Al coated, coppered, tinned, and any other metallic coating, samples of any of the finish galvanized/ Zn-Al coated/coppered/tinned/ any other metallic coating is to be drawn and tested. If samples of coated wires are drawn and tested, other finishes involving uncoated wires (Annealed, bright drawn/dry drawn) may also be covered. For covering other finishes alone, involving uncoated wires (Annealed, bright drawn/dry drawn), samples of any of these finishes is to be drawn and tested.

Note: The coating weight and test method for finishes other than galvanized (Zn) and Zn-Al alloy coated wires, declaration, as applicable, is to be obtained for test method followed for testing the coating requirements against the agreed upon values between the purchaser and the manufacturer.

iii) For Condition (Table-2):- For covering the conditions annealed & soft drawn one sample of either annealed or soft drawn is to be drawn and tested. For covering the conditions hard, ½ hard & ¼ hard one sample of hard is to be drawn and tested. If the sample drawn is of ½ hard then both ½ hard & ¼ hard can be covered.

iv) For Coating Class (Cl 11.1)- For coating class of wires, a sample of the highest class in terms of 'coating mass per unit area' shall be drawn and tested, to cover all lower coating classes intended to be covered under the scope of licence. For instance, if a sample of Class A is drawn & tested, then Class AB, B, C & D to be covered in the scope of licence.

2. While considering Grant of licence/inclusion of additional varieties, it shall be ensured that the applicant/licensee has got complete manufacturing and testing facilities for all the sizes/finishes/conditions applied.

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

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

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

Sl. No.	Test Equipment/Chemicals and Identification Numbers (Where applicable)	Tests Used in with Clause Reference
1.	Micrometer	Cl 7,8 (Diameter & Tolerances)
2.	Tensile Testing Machine	Cl 9.1 (Tensile Strength)
3.	Wrapping Test Machine, 10X magnifying glass, mandrels of suitable sizes (8 times diameter of wire)	Cl 9.2 (Wrapping Test)
4.	Any testing machine or arrangement to bend the wire through an angle of 90° round a former of diameter equal to twice of diameter of wire being tested, Angle Protractor	Cl 9.3(Bend Test)
5.	Rough Polishing Machine Cutting Machine, Fine Polishing Machine Grinder Machine	Cl 5 (chemical composition) Preparation of specimen
6.	Weighing balance, Clean soft cotton cloth, Vernier Caliper, micrometer	Cl 11 (Coating Test)
7.	Stripping method: Antimony trioxide / Antimony tri chloride, Conc.HCl,soft cotton cloth, solvent naphtha, trichloroethylene, alcohol, Distilled Water.	
8.	100 ml glass burette with stopcock, rubber tube, reservoir (for Volumetric method for using below 5mm nominal dia) and other glassware as applicable in addition to the reagents mentioned above.	
9.	Copper carbonate (laboratory grade) or Copper hydroxide (laboratory grade), Copper Sulphate Crystals – Technical grade, Ammonium Hydroxide, Alcohol, Distilled water, Volatile organic solvent such as ether, trichloroethylene, carbon tetrachloride, etc. and other chemicals and reagents applicable	Cl 11.2 (Uniformity of Zinc Coating)
10.	Room Air conditioner with temperature control facility	
11.	Thermometer, hydrometer	
12.	Instrumental methods	Cl 5 for C,S,P,Mn,Si,Cu,Al

	Spectrometer: atomic-absorption spectrometry, inductively coupled plasma atomic emission, inductively coupled plasma mass spectrometry techniques, spark source optical emission spectrometry. Spectrophotometer	Mn,S,P,Si
13.	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	Cl 5 for C& S (chemical method, alternative to instrumental method)
14.	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	Cl 5 Phosphorus content (chemical method, alternative to instrumental method)
15.	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	Cl 5 Manganese content (chemical method, alternative to instrumental method)

16.	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	Cl 5 Silicon content (chemical method, alternative to instrumental method)
17.	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	Cl 5 Cu content (chemical method, alternative to instrumental method)
18.	Vision-based inspection system	13(freedom from defects)

Note: The above is an indicative list for the purpose of guidance only

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: All coils of mild steel wires for general engineering purposes manufactured from same cast of wire rod in a day under uniform conditions of production shall be considered as one 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/empanelled 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 license and Licence Number (i.e. CM/L...) shall be suitably incorporated on the product and on the Test Certificate issued along with each consignment, provided always that the product thus marked and packed conforms to all the requirement of the specification.

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

3.2 **Additional Marking requirements:** The material shall also be marked with the following additional requirement:

- a) “For BIS certification details please visit www.bis.gov.in”
- b) Any other requirement not specified in the Indian Standard

4. TEST CERTIFICATE – For each consignment of BIS Certified material conforming to IS 280:2006 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)		(4)
TEST DETAILS					LEVELS OF CONTROL		REMARKS
Clause	Requirements	Test Method		Test equipment requirement R: required (or) S:Sub-contracting permitted	No. of Samples	Frequency	
		Clause	Reference				
5 & 6	Manufacture &Chemical Composition	5 & 6	IS 280, IS 228 (Various Parts), IS 7887 or any established Chemical/Instrumental method	R	One	Each Cast	No testing is required in case each consignment of material used for wire drawing is ISI marked and received with test certificate.
7 & 8	Dimension & Tolerances	7.1, 7.2, 8 & Table-1	IS 280	R	One	Each Coil	
9	MECHANICAL PROPERTIES						
9.1	Tensile Test	9.1, Table-2	IS 280	R	One	1 in every 5 coils or part thereof for each control unit	
9.2	Wrapping test	9.2	IS 280	R	One	-do-	Applicable for wires smaller than 5mm dia
9.3	Bend test	9.3	IS 280	R	One	-do-	Applicable for wires of dia 5mm and above

11	Coating Test						
	Mass of Zinc Coating	11.1	IS 6745	R	One	-do-	
	Tinned /Coppered/Any other metallic coating	11.2	IS 280	R	As agreed between the manufacturer and the purchaser.		
13	Freedom from defects	13	IS 280	R	Adequate inspection to ensure that finished wires are sound and free from defects.		

Annexure-I
(Para 4 of the Scheme of Inspection and Testing)
XYZ IRON AND STEEL Company
(Registered office Address and works address)

ISI Mark
With IS No.
and CM/L
no.

Test Certificate for Mild Steel Wire for General Engineering Purposes
TEST CERTIFICATE NO. _____

To M/s _____

Dated _____

We certified that the material described below fully conforms to IS 280:2006 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 Licence No. CM/L _____ are as indicated below against each order No.

(PLEASE REFER TO IS 280:2006 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order No. & Date	Nom Dia)	Control unit No.	Finish	Qty	Chemical Composition (in %)						Coating Test	Tensile Test	Wrapping test	Bend test
					C	S	P	Si	Mn	Cu *	Al			
												Mass of coating		

* if required by purchaser

Remarks

Wagon No.

Truck No.

FOR XYZ IRON AND STEEL COMPANY

(It is suggested that size A4 paper be used for this test Certificate)