PRODUCT MANUAL FOR
Hot Rolled Steel Narrow Width Strip for Welded tubes and Pipes According to IS 15647:2006

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

1.	**Product**	**:**	**IS 15647:2006**
	Title	**:**	**Hot Rolled Steel Narrow Width Strip for Welded tubes and Pipes**
	No. of amendments	**:**	0
2.	**Sampling Guidelines**		
a)	**Raw material**	**:**	No specific requirement
b)	**Grouping Guidelines**	**:**	Please refer Annex – A
c)	**Sample Size**	**:**	For physical tests: 1.5 m For chemical tests : 50 gm drillings or 5pcs each of length 5 cm for OES (ref: CL/OES dated:15 07 2019)
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 Physical tests and Chemical Composition
6.	**Scope of the Licence :**		
	Licence is granted to use Standard Mark as per IS 15647:2006 with the following scope:		
	Name of the product	Hot Rolled Steel Narrow Width Strip for Welded tubes and Pipes	
	Dimensions	Thickness from …mm upto and including …mm Width from …mm upto and including …mm	
	Grade	1, 2,..	

BUREAU OF INDIAN STANDARDS
Manak Bhawan, 9, Bahadur Shah Zafar Marg,
New Delhi – 110002

ANNEXURE A
TO PRODUCT MANUAL FOR
HOT ROLLED STEEL NARROW WIDTH STRIP
FOR WELDEDTUBES AND PIPES
According to IS 15647:2006

GROUPING GUIDELINES

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Hot rolled steel strip for welded tubes and pipes according to IS 15647: 2004 are classified on the basis of minimum yield stress and tensile strength. The arrangement of grades in increasing order of superiority is mentioned below:

YS(Min) & UTS(Min) ↓	Grade
	1
	2
	3

The following guidelines shall be followed for considering grant of licence/inclusion as per IS 15647:2006 :

One sample of any size, mode of de-oxidation of hot rolled steel narrow width strip of the Highest Yield Strength, among grades applied for, shall be drawn and tested. On testing of the sample, grades including the Highest Yield Strength and those with lower strength limits may also be covered in scope of licence.

In case of testing for Dimensions and Tolerances, coils from which samples are drawn for independent testing, may be tested in the factory. Under such circumstances, samples drawn for independent testing may not required to be tested for the above physical parameters.

Theappropriate undertaking/declaration as per Notes given under Table-1 of IS 15647:2006 may be obtained. In addition, micro-alloying contents as applicable alongside mode of deoxidation may be reflected in the test request for samples drawn for independent testing.

While considering grant of licence/inclusion of additional varieties, it shall be ensured that complete manufacturing facilities, testing equipments for all requirements are available with manufacturer.

ANNEXURE B
TO PRODUCT MANUAL FOR
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LIST OF TEST EQUIPMENTS

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Major test equipment essentially 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.	Rough Polishing Machine, Abrasive Cutting Machine, Fine Polishing Machine, Grinding Machine, Molding machine, Longitudinal cutting machine	Preparation of specimen
2.	Vernier Callipers, Micrometer	Cl.12 & 13 (Dimensions and Tolerances)
3.	Steel Scale, Measuring tape, Weighing Balance, flat table, Straight Edge, cord	Cl.12 , 13 & 15 (Dimensions and Tolerances)
4.	Universal Tensile Testing Machine	Cl.8(Tensile Test)
5.	Bending Device with Supports, Steel Mandrels of suitable Internal Diameters for different thicknesses, UTM attachments, Magnifying glass	Cl.9(Bend Test)
6.	**Instrumental methods** Spectrometer: atomic-absorption spectrometry, inductively coupled plasma atomic emission, inductively coupled plasma mass spectrometry techniques, spark source optical emission spectrometry. Spectrophotometer	Cl 7.1,7.2 (C,S,P,Mn,Si,Al elements content) Mn,S,P,Si
7.	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.7.1, 7.2 (chemical method for C& S, alternative to instrumental method)
8.	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 (Na_2NO_3), Ammonium Molybdate [$(NH4)_2$ Mo_2O_7],	Cl 7.1,7.2 (chemical method for Phosphorus content, alternative to instrumental method)

	Ammonium Phosphate [$(NH4)_3$ 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	
9.	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 7.1,7.2 (chemical method for Manganese content, alternative to instrumental method)
10.	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 hydroflouric acid	Cl 7.1,7.2 (chemical method for Silicon content, alternative to instrumental method)
11.	Determination of Nitrogen by Thermal Conductivity Method/By Inert gas fusion followed by thermal conductivity detection/ By Steam Distillation Method	Cl 7.1,7.2 (N content)
12.	Vision-based inspection system	Cl 11 (Freedom from defects)

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

ANNEXURE C
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FOR WELDEDTUBES AND PIPES
According to IS 15647:2006

SCHEME OF INSPECTION AND TESTING

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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 equipments.

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

3. LABELLING, MARKING, PACKING- The Standard Mark as given in schedule of the licence and Licence Number (i.e. CM/L……..) shall be incorporated, and the marking and packing shall be done as per the provisions of the Indian Standard, provided always that the product thus marked conform to all the requirements of the specification.

4. CONTROL UNIT - For the purpose of this scheme material produced continuously from the same cast to same dimensions during one shift shall constitute a control unit.

5. LEVELS OF CONTROL - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

5.1 All the production which conforms to the Indian Standards and covered by the licence should be marked with Standard Mark.

6. TEST CERTIFICATE-For each consignment of BIS Certified material conforming to IS 15647:2006 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)

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.

ANNEXURE C
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SCHEME OF INSPECTION AND TESTING
TABLE 1: LEVELS OF CONTROL

(1)				(2)	(3)		
Test Details				**Test equipment requirement R:Required (or) S: Sub-contracting permitted**	**Levels of Control**		
Clause	**Requirements**	**Test Method**			**No. of Samples**	**Frequency**	**Remarks**
		Clause	**Reference**				
7	Chemical Composition	The method as specified in relevant ISO Standard may also be followed as an alternate method					
	a) Ladle Analysis	7.1, 10	IS 15647 IS 228 (in parts)	R	1	One heat / 20 tonnes or part thereof	Applicable for manufacturers with steel making facilities.
	b) Product analysis	7.2, 10		i) R	i) Nil	i) Nil	Applicable for manufacturers with steel making facilities and ensuring traceability to the cast.
				ii) R	ii) 1	ii) One heat / 20 tonnes or part thereof	Applicable for manufacturers feeding to rolling mills through reheating furnace (see Note-3)
8	Tensile Test	8.1,8.2 8.3, 8.3.1 10	IS 1608 Pt.1 IS 15647	R	1	20 tonne or part thereof per each Control Unit	
9	Bend test	9.1,9.2 9.2.1 to 9.2.4 10	IS 1599 IS 15647	R	1	20 tonne or part thereof per each Control Unit	
11	Freedom from defects	11	IS 15647	R	Adequate inspection as far as possible to ensure each strip to be free from defects such as segregation, lamination, surface flaws and other defects which are detrimental to subsequent processing.		

12	Dimensions & tolerances	12.1 12.2 12.3 12.4	IS 15647 IS 1730 IS 1852 IS 1079	R	Adequate inspection to ensure each strip to be within limits of specification.
13	Condition of narrow width strip	13.1 13.2 13.3 13.4	IS 15647 IS 2049	R	As agreed between manufacturer and purchaser. Adequate inspection to ensure each strip to be within limits of specification.

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.

Note-2: The control unit and levels of control as decided by the Bureau are obligatory to which the licensee shall comply with.

Note -3: No testing for product analysis is required if material fed to rolling mills is ISI marked and received with test certificate

BIS STANDARD MARK

ANNEXURE I

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(Para 6 of the Scheme of Inspection and Testing)

XYZ IRON AND STEEL COMPANY

(Registered office Address and works address)

TEST CERTIFICATE FOR HOT ROLLED STEEL NARROW WIDTH STRIP FOR WELDED TUBES AND PIPES

TEST CERTIFICATE No._____ DATE_____

To M/s_____We certified that the material described below fully conforms to 15647:2006 Chemical composition and Mechanical properties of the product, as tested in accordance with the Scheme of Testing and Inspection contained in the BIS Certification Marks LicenceNo.CM/L_____ are as indicated below against each order No.

(PLEASE REFER TO IS 15647:2006 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order No. & Date	Section (t X w) in mm	Control Unit No.	Grade	Quantity in tonnes	CHEMICAL COMPOSITION						MECHANICAL PROPERTIES				Condition of coils	Remarks
					C %	S %	P %	Si %	Mn %	Al %	Tensile strength	Elongation	Yield Strength	Bend test		

REMARKS

WAGON NO.

TRUCK NO.

FOR XYZ IRON AND STEEL COMPANY

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