



PM/ IS 10748/ 1/ June 2018

**PRODUCT MANUAL FOR**  
**Hot rolled steel strip for welded tubes and pipes**  
**According to IS 10748:2004**

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.	<b>Product</b>	:	<b>IS 10748:2004</b>
	<b>Title</b>	:	<b>Hot rolled steel strip for welded tubes and pipes</b>
	<b>No. of amendments</b>	:	2
2.	<b>Sampling Guidelines</b>		
a)	<b>Raw material</b>	:	No requirement is specified in the standard.
b)	<b>Grouping Guidelines</b>	:	Please refer Annex - A
c)	<b>Sample Size</b>	:	For mechanical test: 0.5 Sq.m For chemical test : 5 pieces of 50 mm length/50 g drilling
3.	<b>List of Test Equipment</b>	:	Please refer Annex - B
4.	<b>Scheme of Inspection and Testing</b>	:	Please refer Annex - C
5.	<b>Possible tests in a day</b>	:	Freedom from defects, Dimensions, Tensile test , Bend test, Condition of Coil, Chemical Composition: By chemical method -- C, S, Mn or By instrumental method –all required elements.
6.	<b>Scope of the Licence :</b>		
	Licence is granted to use Standard Mark as per IS 10748:2004 with the following scope:		
	<b>Name of the product</b>	Hot rolled steel strip for welded tubes and pipes	
	<b>Type</b>	[Grade]	
	<b>Size</b>	[Width and Thickness]	

**ANNEXURE A**  
**TO PRODUCT MANUAL FOR**  
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**GROUPING GUIDELINES**

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Hot rolled steel strip for welded tubes and pipes according to IS 10748: 2004 is classified on the basis of increasing minimum yield stress and decreasing % elongation as mentioned below:

YS(Min)	Grade	% Elongation(Min)
↓	1	↑
	2	
	3	
	4	
	5	
	6	

The following guidelines shall be followed for considering grant of licence/inclusion as per IS 10748:2004 :

One sample each of any size/mode of de-oxidation of carbon steel strip of Highest and Lowest Yield Stress shall be drawn for testing. On testing of the two samples, grades including and in between those strength limits may be covered in scope of licence.

e.g: Alongside one sample of highest grade 6, sample of lowest grade 1 is also to be drawn for covering carbon steel strips of grades 1 to 6.

In case of testing for Dimensions (width), tolerance on edge camber and width(cl.13), freedom from defects, telescopicity (if required), coils from which samples are drawn for independent testing, may be tested in the factory. Under such circumstances, samples drawn for independent testing are not required to be tested for above physical parameters.

The appropriate undertaking/declaration as per Notes given under Table-1 of IS 10748:2004 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**  
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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.	Vernier Callipers, Micrometer	Cl.12 ,13 & 15
2.	Steel Scale(0-1000mm) ,Measuring tape(0-15mtr), Weighing Balance (Range and Least Count- as per the scope required and Mass Requirements given in Table 7 of IS 1730)	Cl. 12,13&15
3.	Universal Tensile Testing Machine Range - 400KN(Minimum) with facility for sample preparation	Cl.8
4.	Bending Device with Supports and a Mandrel or Bending Device with a V-Block or Bending Device with a Clamp , Internal Diameter of Bending mandrels for different Grades and Thickness shall be as per Table 3 of IS 10748, UTM attachments, Magnifying glass	Cl.9
5.	Steel Coil Weigh Bridge	cl.14
6.	Laser Shapemeter or Measuring Tape	cl.15.5
7.	<b>Instrumental methods</b> Spectrometer: atomic-absorption spectrometry, inductively coupled plasma atomic emission, inductively coupled plasma mass spectrometry techniques, spark source optical emission spectrometry.  Spectrophotometer	Cl8.1,8.2 for C,S,P,Mn,Si,Al, Cu, Microalloying and alloying elements content  Mn,S,P,Si
8.	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.8.1, 8.2 –C& S (chemical method, alternative to instrumental method)
9.	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	Phosphorus content Cl8.1,8.2 (chemical method, alternative to instrumental method)

	Potassium Permanganate (KMnO <sub>4</sub> ), Sodium Nitrite (Na <sub>2</sub> NO <sub>3</sub> ), Ammonium Molybdate [(NH <sub>4</sub> ) <sub>2</sub> Mo <sub>2</sub> O <sub>7</sub> ], Ammonium Phosphate [(NH <sub>4</sub> ) <sub>3</sub> PO <sub>4</sub> ], Potassium Nitrate (K <sub>2</sub> NO <sub>3</sub> ), Phenolphthalein Solution, Rectified spirit or methyl alcohol, Sodium Hydroxide (NaOH), Hydrofluoric Acid (HF), Perchloric Acid (HClO <sub>4</sub> ), Sulphurous Acid, Hydrobromic Acid (HBr), other chemicals and reagent as applicable	
10.	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 Cl8.1,8.2 (chemical method, alternative to instrumental method)
11.	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	Silicon content Cl8.1,8.2 (chemical method, alternative to instrumental method)
12.	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	Cu content Cl8.1,8.2 (chemical method, alternative to instrumental method)
13.	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 Cl8.1,8.2 (chemical method, alternative to instrumental method)
14.	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.	Cr content Cl8.1,8.2 (chemical method, alternative to instrumental method)

**Nitrogen content shall be occasionally tested.**

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

**ANNEXURE C**  
**TO PRODUCT MANUAL FOR**  
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**According to IS 10748:2004**

**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 under uniform conditions to same dimensions in a day in the same place shall be considered as one 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 10748:2004 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**

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**TABLE 1: LEVELS OF CONTROL**

(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				
7	Chemical Composition						
	Ladle Analysis	7.1 & 10	IS 10748 & IS 228 (Various Parts) Or any established Chemical/ Instr. method	R	One	Each Heat	Applicable for manufacturers with steel making facilities
	Product Analysis	7.2 & 10	-do-	R	i) Nil  ii)One	i)Nil  ii) Each Cast	i)Applicable for manufacturers with steel making facilities.  ii)*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 10748 , IS 1608& IS 3803 (Pt.1)	R	2 (cast size < 100 tonnes)  3(cast size 100-200 tonnes)  4 (cast size> 200 tonnes)	Every Control Unit	
9	Bend Test	9.1,9.2, 9.2.1,9.2.2, 9.2.3,9.2.4 &10	IS 10748 & IS 1599	R	1	Every Control Unit	
11	Freedom from Defects	11	IS 10748	R	Adequate inspection to ensure each item to be free from defects which are detrimental to subsequent processing and ultimate use.		
12	Dimensions	12	IS 10748 IS 1730	R	Adequate inspection to ensure that each coil conforms to nominal dimensions specified or as agreed between manufacturer and supplier.		
13	Tolerances	13.1,13.2, 13.3 & 10	IS 10748, IS 1852 IS 1079	R	Adequate inspection to ensure that each coil conforms to tolerances stipulated in relevant standard.		
14	Coil Mass and Diameter	14	IS 10748	R	As agreed between purchaser and manufacturer.		
15	Condition of Coil	15.1, 15.2,15.2,15.3, 15.4	IS 10748	R	Each coil to be checked for condition. Unless otherwise specified by purchaser coil shall be supplied in as-rolled condition. Coil Edges and cropping outer edge of coil may be as agreed between purchaser and manufacturer.		
		15.5	IS 10748	S	Telescopicity in coils should not be more than 100mm.		

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 empaneled 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.

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

**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 STRIP FOR WELDED TUBES AND PIPES**

TEST CERTIFICATE No. \_\_\_\_\_

DATE \_\_\_\_\_

To M/s \_\_\_\_\_

We certified that the material described below fully conforms to 10748:2004 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 Licence No. CM/L \_\_\_\_\_ are as indicated below against each order No.

(PLEASE REFER TO IS 10748:2004 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

**TEST RESULTS**

Order No. & Date	Section (nom Size)	Control Unit No.	Grade	Quantity in tonnes	CHEMICAL COMPOSITION							MECHANICAL PROPERTIES				Condition of coils	Remarks		
					C %	S %	P %	Si %	Mn %	*Cu %	@Micro Alloying Elements %	Al %	CE	Tensile strength	Elongation			Yield Stress	Bend test

\* For copper-bearing quality

@ Micro-alloying element present should be indicated

REMARKS

WAGON NO.

TRUCK NO.

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

FOR XYZ IRON AND STEEL COMPANY