

**PRODUCT MANUAL FOR
STRUCTURAL STEEL (ORDINARY QUALITY)
according to IS 15911:2010**

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 15911:2010
	Title	:	STRUCTURAL STEEL (ORDINARY QUALITY)
	No. of amendments	:	0
2.	Sampling Guidelines		
a)	Raw material	:	No specific requirement
b)	Grouping Guidelines	:	Please refer Annex – A
c)	Sample Size	:	For mechanical test: 1 metre For chemical test : 5 pieces of 50 mm length/50 g drilling
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 tests
6.	Scope of the Licence :		
	Licence is granted to use Standard Mark as per IS 15911:2010 with the following scope:		
	Name of the product	STRUCTURAL STEEL (ORDINARY QUALITY)	
	Grade Designation	E165,..	
	Form(Size)	<i>[Mention range of nominal sizes for various steel varieties (flat products/sections/Steel bars)</i>	

ANNEXURE A
TO PRODUCT MANUAL FOR
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GROUPING GUIDELINES

1. Specification for Structural Steel(Ordinary Quality) according to IS 15911: 2010 is classified on the basis of the following:

- Form (bars/sections/flat products)
- Yield Stress

2. The following grouping based on type of product, shall be followed for considering grant of licence/inclusion as per IS 15961:2010

Group Number	Group Description	Grouping guidelines
1	Flat Products: (1) Strips & Flats (2) Bulb Flats	One sample of any size/mode of de-oxidation of Higher Yield Stress (Minimum) shall be drawn and tested. On testing of the sample, all grades of higher to lower Yield Stress(Minimum) and sizes in the group can be covered in scope of licence.
2	Sections: (1) Beam, Column, Channels and Angles (2) Bulb Angles, (3) Channel sections (4) Tee Bars	
3	Bars : Round and Square Bars	

3. It shall however be ensured that firm has necessary manufacturing capabilities and testing facilities for the entire sizes/processes proposed to be covered under scope of BIS Certification.

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

ANNEXURE B
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LIST OF TEST EQUIPMENTS

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, Cutting Machine, Fine Polishing Machine, Grinder Machine	Preparation of specimen
2.	Vernier Callipers, Micrometer, Steel Scale ,Try-square, Radius gauges, Filler Gauges, Depth gauges, Straight edges, Magnetic V-block, Angle Protector (combination set), Protector outside and inside calliper, Carbon Paper ,Analytical balance (0-200g,Lc:0.1mg), Weigh M/c, Steel tape	Dimensions (12) Tolerances (13)
3.	UTM (0-1000 KN)	Tensile test (10)
4.	Steel Mandrels (for bend tests), Templates (for Bend test), UTM attachments/clamps/vice/Magnifying glass	Bend Test(11)
5.	Instrumental methods Spectrometer: atomic-absorption spectrometry, inductively coupled plasma atomic emission, inductively coupled plasma mass spectrometry techniques, spark source optical emission spectrometry. Spectrophotometer	C,S,P,Mn,Si,Al, Cu, Microalloying and alloying elements content (8) Mn,S,P,Si
6.	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	C& S (8) (chemical method, alternative to instrumental method)
7.	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 (8) (chemical method, alternative to instrumental method)

	Potassium Permanganate (KMnO ₄), Sodium Nitrite (NaNO ₂), Ammonium Molybdate [(NH ₄) ₂ MoO ₇], Ammonium Phosphate [(NH ₄) ₃ PO ₄], Potassium Nitrate (KNO 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	
8.	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 (8) (chemical method, alternative to instrumental method)
9.	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 (8) (chemical method, alternative to instrumental method)
10.	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 (8) (chemical method, alternative to instrumental method)
11.	Inert gas fusion followed by determination using thermal conductivity detector	Nitrogen Content (8)

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

ANNEXURE C
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SCHEME OF INSPECTION AND TESTING

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, PACKING & MARKING – The Standard Mark as given in Column (1) of the First Schedule of the license 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 and packed conforms to all the requirement of the specification. In addition, details of BIS website as follows: “For details of BIS certification please visit www.bis.gov.in” shall be marked on metal tags tied to bundles.

4. CONTROL UNIT – All structural steel hot rolled to same dimensions and form (Angle or Channel or Flat or Round etc.), representing the same cast & grade designation, manufactured under uniform conditions of production in a day in the same place.

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.

5.2 General requirements relating to the supply of material shall conform to IS 8910 and manufacture of structural steel shall be as per Cl 6 of IS 15911:2010.

6. TEST CERTIFICATE - For each consignment of BIS Certified material conforming to IS 15911:2010 there shall be a test certificate which shall contain the Standard Mark, the 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.

TABLE 1: LEVELS OF CONTROL

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
7	Freedom from defects	7.1 to 7.3	IS 15911: 2010	R			
8	Chemical Composition						
	Ladle analysis	8.1 Table-1	IS 15911: 2010 & IS 228 (Various Parts) Or any established Chemical/ Instr. method	R	One	Each Heat	Applicable only for manufacturers with steel making facilities
	Product analysis	8.2 Table-1,2		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)
10	Tensile Test	9,10.1 to 10.3.2 Table-3	IS 15911, IS 1608 Pt.1 IS 3803 Pt.1	R	2	Every Control Unit	
11	Bend Test	11.1 to 11.3.1 Table-3	IS 15911 IS 1599	R	2	Every Control Unit	
12 & 13	Dimensions & Tolerances	12 & 13 and Table 4	IS 15911, IS 1852, IS 808, IS 1173, IS 1730, IS 1732, IS 1863 IS 3954	R	Adequate inspection to ensure each item conforms nominal dimensions and tolerances stipulated in relevant standard.		

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

BIS
STANDARD
MARK

(Para 6 of the Scheme of Inspection and Testing)
XYZ IRON AND STEEL COMPANY
(Registered office Address and works address)
TEST CERTIFICATE FOR STRUCTURAL STEEL (ORDINARY QUALITY)

TEST CERTIFICATE No. _____ DATE _____
TO M/s _____

We certified that the material described below fully conforms to IS 15911:2010 Chemical, Physical 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 15911:2010 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order No. & Date	Section (nom Size)	Control Unit No.	Grade & Quality	Quantity in tonnes	CHEMICAL COMPOSITION								MECHANICAL PROPERTIES				Optional	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