



PM/ IS 6911/ 1/ Aug 2018

**PRODUCT MANUAL FOR
(Stainless Steel Plate, Sheet and Strip)
According to IS 6911:2017**

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 6911:2017
	Title	:	Stainless Steel Plate, Sheet and Strip
	No. of amendments	:	2
2.	Sampling Guidelines		
a)	Raw material	:	No specific requirement for raw material
b)	Grouping Guidelines	:	Please refer Annex - A
c)	Sample Size	:	5 pieces of 5 cm x 5 cm for chemical tests 0.5 m x 0.5 m for mechanical tests (Prepared tests for pieces for thickness > 4 mm)
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 6911:2017 with the following scope:		
	Name of the product	Stainless Steel Plate, Sheet and Strip	
	Grade designation	301, 302, 304S1..	
	Condition	Hot rolled/cold rolled	
	Heat treatment	Annealed with air or water quenching	
	Size	Nominal width from... to ... mm Thickness from ... to ... mm	
	Surface finish	Mill Finish – 2D, 2B etc. Polish Finish – 3, 4 etc.	

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 Series	Remarks
1	400-Ferritic	One sample each from the group, of hot rolled and cold rolled conditions, of any heat treatment process if so followed by the manufacturer, of any one of the grade designations, of Stainless Steel Plate, Sheet and Strip, as applied for licence/inclusion may be drawn and to be tested for all requirements of the specification applicable to the variety tested.
2	400-Martensitic	One sample each from the group, of hot rolled and cold rolled conditions, of any heat treatment process if so followed by the manufacturer, of any one of the grade designations, of Stainless Steel Plate, Sheet and Strip, as applied for licence/inclusion may be drawn and to be tested for all requirements of the specification applicable to the variety tested.
3	200-Austenitic	One sample each from the group, of hot rolled and cold rolled conditions, of any heat treatment process if so followed by the manufacturer, of any one of the grade designations, of Stainless Steel Plate, Sheet and Strip, as applied for licence/inclusion may be drawn and to be tested for all requirements of the specification applicable to the variety tested.
4	300-Austenitic	One sample each from the group, of hot rolled and cold rolled conditions, of any heat treatment process if so followed by the manufacturer, of any one of the grade designations, of Stainless Steel Plate, Sheet and Strip, as applied for licence/inclusion may be drawn and to be tested for all requirements of the specification applicable to the variety tested.
5	900-Austenitic	One sample each from the group, of hot rolled and cold rolled conditions, of any heat treatment process if so followed by the manufacturer, of any one of the grade designations, of Stainless Steel Plate, Sheet and Strip, as applied for licence/inclusion may be drawn and to be tested for all requirements of the specification applicable to the variety tested.
5	Low Nickel-Austenitic (i.e. N1, N2, N3)	One sample each from the group, of hot rolled and cold rolled conditions, of any heat treatment process if so followed by the manufacturer, of any one of the grade designations, of Stainless Steel Plate, Sheet and Strip, as applied for licence/inclusion may be drawn and to be tested for all requirements of the specification applicable to the variety tested.

6	Duplex	One sample each from the group, of hot rolled and cold rolled conditions, of any heat treatment process if so followed by the manufacturer, of any one of the grade designations, of Stainless Steel Plate, Sheet and Strip, as applied for licence/inclusion may be drawn and to be tested for all requirements of the specification applicable to the variety tested.
<p>Note: 200-Austenitic grade designation series refers to all austenitic type grades bearing numerical symbol of the type 2xxx.. such as 201, 201A, 204Cu1 etc., Similarly for 400-Ferritic, 400-martensitic, 300-austenitic, 900-austenitic etc.</p>		

2. During preliminary inspection, before drawing samples for independent testing, it shall be ensured by IO that samples to be drawn for independent testing have to be tested at factory for Dimensions as per cl.17 of IS 6911:2017. In case of inclusion, factory test report for Dimensions as per cl.17 of IS 6911:2017 may be accepted and conformity of the grades included to the same has to be verified during next surveillance visit.

3. Surface Finish: Certain surface finishes get converted to superior surface finishes based on further processing. Further, some surface finishes are independent of each other. Hence, recommendation on polished finishes shall be restricted depending upon the manufacturing facility available with the firm.

Note: If no heat treatment is involved while changing the appearance to superior surface finish then test requirements of previous finish is to be made applicable for superior finish as well.

4. A declaration shall be obtained from the applicant on each heat treatment process (Annealing, Hardened and tempered or any other treatment), based on the manufacturing capabilities, exercised for each group.

5. 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 Sheet and Strip to be included in the licence.

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.

Sno	Test Equipment/Chemicals	Tests Used Clause Reference
1	<p>Device for instrumental chemical analysis such as Optical Spectrometer with all requisite channels</p> <p>OR</p> <ul style="list-style-type: none"> • 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 <p>Chemicals and reagents as applicable</p> <p>(Indicative element wise list of test apparatus, chemicals and reagents is enclosed)</p>	Chemical Composition as per Cl 7
2	Tensile Testing Machine	Tensile Test as per Cl 10.1
3	Hardness Tester (Vickers/Brinell/Rockwell)	Hardness as per Cl 10.2
4	Erichsen cupping Test apparatus	As per Cl 11
5	Vernier Calipers, Micrometer, Steel Scale, Surface Table, Measuring Tape, Feller Gauge	Dimension as per Cl17
11	Bend Test Equipment/ Mandrels/Templates/ UTM attachments/ clamps/vice/Magnifying	Bend Test as per Cl 10.1

	Glass.	
12	<p>Apparatus for corrosion resistance test</p> <p><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</p> <p><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, Trichloroethylene or any other suitable solvent Apparatus for bend test, flattening test</p>	Corrosion Resistance as per Cl.12

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ANNEXURE B
TO PRODUCT MANUAL FOR
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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, 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)
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 ₂ NO ₃), Ammonium Molybdate [(NH ₄) ₂ Mo ₂ O ₇], Ammonium Phosphate [(NH ₄) ₃ PO ₄], Potassium Nitrate (K ₂ NO 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 8.1,8.2 (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 8.1,8.2 (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 8.1,8.2 (chemical method, alternative to instrumental method)

	concentrated sulphuric acid, Dilute Hydrochloric Acid, Dilute Sulphuric Acid, Perchloric Acid, Tartaric acid and hydrofluoric 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 CI 8.1,8.2 (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 CI 8.1,8.2 (chemical method, alternative to instrumental method)
7.	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 CI 8.1,8.2 (chemical method, alternative to instrumental method)

Nitrogen content shall be occasionally tested.

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
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**SCHEME OF INSPECTION AND TESTING
FOR CERTIFICATION OF IS 6911:2017**

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, 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 nominal thickness and same surface finish, 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.

**SCHEME OF INSPECTION AND TESTING
FOR CERTIFICATION OF IS 6911:2017**

Table 1: Levels of Control

(In addition to the test requirements given below, there may be other requirements in the Standard for example clause 5 (Manufacture) for which compliance is to be ensured and demonstrated to BIS)

(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	6.1 6.2	IS 6911:2017	R	Each Plate/sheet/strip	Each Plate/sheet / strip	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 9.1.1 Table1	IS 6911:2017 IS 228	R	One	Each Heat	Applicable for primary stainless steel producers only
	Product analysis	7.2 9.1.2 Table1	IS 6911:2017 IS 228	R	As agreed between purchaser and supplier refer Cl.9.1.2 of IS 6911: 2017		Applicable for primary producers.
				R	One	Each Cast	Applicable for Re-rollers. (No testing is required if the material is ISI marked and received with test certificate)
10	Tensile test: a)0.2 Percent proof Stress b) Tensile Strength c)	10.1 10.4 10.5	IS 6911:2017 IS 1608 Table 4 & Table 6	R	*One	Each Control unit	*refer Cl 9.2 of IS 6911:2017

	Percentage Elongation d) Hardness e) Bend Test(if required)	10.2 10.4 10.3& 10.3.1	Table 4, Table 5 & Table 6 IS 1500(part 1) IS 1586 (part1) IS 1501(part 1) IS 1599 Table 4		*One One	Each Control unit Each control unit	
11	Erichsen Cupping Test	9.2 11.1 & 11.2 Table 7	IS 10175	R	Refer Cl.11 of IS 6911:2017		Subject to agreement between Purchaser and supplier
12	Corrosion Resistance	12	IS 6911:2017 IS 10461(part 1) IS 10461(part 2)	R	Refer Cl.11 of IS 6911:2017		The material shall be tested for corrosion resistance if and as required by the purchaser.
15	Surface Finish	15.1 15.2,15.3 Table 8	IS 6911:2017	R	EachPlate/ Sheet/Strip	EachPlate/ Sheet/ Strip	If found defective item shall be rejected and not be marked
17	Dimensions and Tolerance	17.1 17.2 Table 9 to 19	IS 6911:2017	R	Adequate inspection to ensure each item to be within the limits of specification		
13	Other Test	13	IS 6911:2017	R	Any test, other than those specified in this specification, may be conducted subject to mutual agreement between the purchaser and the supplier.		

Note 1: The control unit and levels of control as decided by the Bureau are obligatory to which the licensee shall comply with.