PRODUCT MANUAL
FORSTAINLESS STEEL TUBES FOR THE FOOD AND BEVERAGE INDUSTRY ACCORDING TO IS 6913:1973

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 6913:1973
	Title	:	Stainless Steel Tubes For The Food And Beverage Industry
	No. of Amendments	:	Nil
2.	**Sampling Guidelines:**		
a)	**Raw material**	:	No specific requirement
b)	**Grouping guidelines**	:	Please refer ANNEX-A
c)	**Sample Size**	:	1m x 2 pcs, 5cmx5cm(prepared flattened test pieces for chemical)/50g drillings
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 6913:1973 with the following scope		
	Name of the product	Stainless Steel Tubes For The Food And Beverage Industry	
	Grade	A,B,C,D	
	Finishing Type	Hot Finished/Cold Finished	
	Type of tube	Seamless/Welded	
	Optional requirement	With or without Corrosion Resistance	

ANNEX A

Grouping Guidelines

1. The grouping to be followed for GOL/CSoL of Stainless Steel Tubes for the Food And Beverage Industry is as given below:

Group	Grade	Finishing Type	Manufacturing Process
I	A,B	hot finished and cold finished	welded and seamless
II	C, D	-do-	-do-

2. The grouping has been done on the basis of chemical composition

3. Further there are two type of tubes on the basis of manufacturing process i.e Welded tubes and Seamless tubes and on the type of finishing: hot finished and cold finished.

4. One sample of any grade, highest size,of each type of manufacturing process (welded and seamless), type of finishing (hot finished and cold finished) from each group to be tested to cover lower sizes of tubes ofall other grades of the group.

5. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.

6. During the operation of the Licence, BO shall ensure that all the varieties covered in the Licence are tested in rotation, to the extent possible.

ANNEX B

List of Test Equipment

Major test equipment required to test as per the Indian Standard

S. No.	Tests used in with Clause Reference	Test Equipment
1.	Chemical Composition(Cl 5)	Device for instrumental chemical analysis such as Optical Spectrometer with all requisite channels OR •Carbon Sulphur (Strohlein'stype) 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 Chemicals and reagents as applicable (Indicative element wise list of test apparatus, chemicals and reagents is enclosed)
2.	Dimensionand tolerances(Cl 6 & 7) table - 2	Pie tape, Micrometer, Tape, Flat table
3.	Finish (Cl 8.3)	Roughness tester (Ra value measurement)as per IS 3073:1967
4.	Corrosion Resistance(Cl 9)	Facility as per agreement between manufacturer and purchaser
5.	Tensile Test(Cl 10)	Universal Testing Machine(UTM)

The above list is indicative only and may not be treated as exhaustive

	Reagents and chemicals	
1.	Strohlein or Leco apparatus with all attachments Barometer with chart, Hot plate, Muffle furnace, Complete range of glass wares, measuringcylinders, 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.5.1 – 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 (KMnO4),Sodium Nitrite (Na2NO3), Ammonium Molybdate [(NH4)2Mo2O7], 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	Phosphorus content Cl 5.1 (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 5.1 (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, concentrated sulphuric acid, Dilute Hydrochloric Acid, Dilute Sulphuric Acid, Perchloric Acid, Tartaric acid and hydroflouric acid	Silicon content Cl 5.1 (chemical method, alternative to instrumental method)
5.	ashless paper pulp, paper pulp pad, hot plate, dessicator, Reagents: ammonium nitrate, methyl red, dilute	Ni content Cl 5.1 (chemical method, alternative to instrumental

	ammonium hydroxide, Concentrated hydrochloric acid Concentrated nitric acid, Perchloric acid, Hydrofluoric Acid	method)
6.	Hot plate, stop watch Reagents: dilute sulphuric acid and phosphoricacid mixture, concentrated nitric acid, ammonium persulphate , silver nitrate, dilute hydrochloric acid, ferrous ammonium sulphate, standard potassium permanganate solution	Cr content Cl 8.1,8.2 (chemical method, alternative to instrumental method)
7.	Beaker, dropper, Hot Plate, Platinum crucible Reagents:Sulphuric acid, Nitric acid, Hydroflouric acid, Boric Acid, Potassium Bisulphite, Ferrous Sulphate,Alpha Benzoinoxime, Bromine water,Ammonium Hydroxide, tartaric acid, Hydrogen Sulphide, Cinchonine solution,	Mo content Cl 5.1(chemical method, alternative to instrumental method)

The above list is indicative only and may not be treated as exhaustive

ANNEX C

Scheme of Inspection And Testing

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 equipments.

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 licence and Licence Number (i.e. CM/L.....) shall be incorporated on each length of tube/pipe, 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.

3.1 BIS website details may also be marked as follows on the pipe or on an attached tag or on the test certificate: “For details of BIS certification please visit www.bis.gov.in”

4. CONTROL UNIT – For the purpose of this scheme, all the tubes of same size and grade, finishing type (hot finished/cold finished) , sametype (welded/seamless) producedunder similar conditions in a shift on same tube mill 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.

6. HYGIENIC CONDITIONS – Proper care shall be taken to see that non-ferrous metals and allows that are joined with stainless steel tubes during fabrication do not leave any harmful deposits affecting either the assembly or the food or beverage being manufactured.

7. **TEST CERTIFICATE**: For each consignment of BIS Certified material conforming to IS 6913:1973 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)

8. 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.

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**				
5	Chemical Composition	5.1	IS 6913	R	One	Each Cast of raw material	If the material is Standard marked /accompanied by test certificate. No further testing is required.
6& 7	Dimensions & Tolerances	6.1,7.1&7.2	IS 6913	R	One	Every hour	In case of failure testing to be done for each length of pipe till five consecutive samples are found passing
8	Finish	8.1 to 8.3	IS6913 &IS3073	R	One	Each control unit	
9	Corrosion Resistance	9.1	IS 6913	S	As per agreement between manufacturer and purchaser		The material shall be testedfor corrosion resistance if andas required by the purchaser.
10	Tensile test	10	IS 1608 (Pt 1)	R	Two	One control unit	

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: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit / batch / lot and submit his own levels of control in column 3 with proper justification for approval by BO Head.

ANNEX I

XYZ IRON AND STEEL COMPANY
TEST CERTIFICATE FOR STAINLESS STEEL TUBES FOR THE FOOD AND BEVERAGE INDUSTRY
(Registered office Address and works address)

TEST CERTIFICATE FOR **STAINLESS STEEL TUBES FOR THE FOOD AND BEVERAGE INDUSTRY**

TEST CERTIFICATE No._____ DATE_____

To M/s_____

We certified that the material described below fully conforms to 6913:1973

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 6913:1973 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order no.	**Control Unit No./Cast No.**	**OD**	**Grade/Type/Finishing/with or without corrosion resistance**	**Chemical Composition (%)**								**Mechanical properties**	
				C	**Si**	**Mn**	**S**	**P**	**Ni**	**Cr**	**Mo**	**Tensile Strength, N/mm^2**	**Elongation (%)**

REMARKS
WAGON NO
TRUCK NO

FOR XYZ IRON AND STEEL COMPANY