PRODUCT MANUAL FOR
SPECIFICATION FOR SPIRAL WELDED PIPES
according to IS 5504:1997

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 5504:1997**
	Title	:	Specification for Spiral Welded Pipes
	No. of amendments	:	4
2.	**Sampling Guidelines**		
a)	**Raw material**	:	No specific requirement
b)	**Grouping Guidelines**	:	Please refer Annex – A
c)	**Sample Size**	:	Chemical composition – 5 pcs of 5cm x 5cm Physical tests - one full length pipe or 6 mtrs In case of larger diameters, for FS drawn, tests for Dimensions and Hydraulic test shall be carried out in factory itself. Testing of Market samples is subsided, complementing the revised MF for the product.
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 5504:1997 with the following scope:		
	Name of the product		Specification for Spiral Welded Pipes
	Dimensions (OD and Thickness)		OD from …mm to …mm Thickness upto and including …mm
	Welding Process		SAW,…

BUREAU OF INDIAN STANDARDS
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New Delhi – 110002

ANNEXURE A
TO PRODUCT MANUAL FOR
Specification for Spiral Welded Pipes
According to IS 5504:1997

GROUPING GUIDELINES
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1. Specification for Spiral Welded Pipes according to IS 5504: 1997 is classified on the basis of the following:

- Welding Process
- Size range

2. Accordingly, following grouping based on quality of product, shall be followed for considering grant of licence/change in licence scope as per IS 5504: 1997: -

Three samples preferably of minimum, intermediate and maximum size (One from each Welding process, if applicable) intended to be covered under the licence shall be tested for all the requirements of the specification.

3. Tests for dimensions and hydrostatic test for larger diameters shall be carried out in factory since it is difficult to draw and transport pipes of larger diameter.

4. 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.

5. 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.	**Instrumental methods** Spectrometer: atomic-absorption spectrometry, inductively coupled plasma atomic emission, inductively coupled plasma mass spectrometry techniques, spark source optical emission spectrometry. Spectrophotometer	5.1,5.2 (C,S,P elements content)
3.	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 acetoneStandard 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	5.1, 5.2 (C& S, chemical method, alternative to instrumental method)
4.	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)2 Mo2O7], 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	5.1, 5.2 (Phosphorus content, chemical method, alternative to instrumental method)

5.	Universal Testing Machine (UTM), Class-1 accuracy or better as per IS 1608	Tensile Test (6.1)
6.	Hydraulic Press or UTM with two parallel platens, which can be subjected to compressive loading to flatten pipes	Flattening Tests (for ERW pipes) (6.2)
7.	Hydraulic Press or UTM with guided bend test Jig having roller shoulders	Submerged Arc Weld Tests (for SAW pipes) (6.3)
8.	Hydrostatic testing machine Fitted with calibrated pressure gauges, sealing devices for each end of the pipe of various dia, water injecting/pumping system.	Hydrostatic Test (Clause 7)
9.	Vernier Calipers, Steel scale, Micrometer (screw) gauge or other suitable device, Measuring Tape	Length (8.1), Thickness and Diameter (8.2), Ovality (8.2.3) & Finish (9)

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

ANNEXURE C
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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. MARKING, PACKING – 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.

4. CONTROL UNIT – For the purpose of this scheme, 200 lengths of pipes or part thereof of same size & thickness manufactured in a shift shall constitute 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.

5.2 General requirements relating to the supply of material shall conform to IS 1387 and manufacture of pipes shall be as per Cl 4 of IS 5504:1997.

6. TEST CERTIFICATE - For each consignment of BIS Certified material conforming to IS 5504:1997 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.

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SCHEME OF INSPECTION AND TESTING
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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						
	Ladle analysis	5.1	Relevant parts of IS 228	R	One	Each Heat	Applicable only for manufacturers with steel making facilities
	Product analysis	5.2	IS 5504	R	One	Each Heat	No product analysis is required for identified material received with BIS standard mark and test certificate.
6.1	Tensile tests	6.1 6.1.1 6.1.2 6.1.3, 6.1.3.1	IS 5504 IS 1608 Pt.1	R	One	Each Control Unit	

6.2	Flattening test (for ERW Pipes)	6.2, 6.2.1, 6.2.2	IS 5504	R	Two (for single lengths) Four (for multiple lengths)	One sample for each end of each single length One each from starting and finishing ends and 2 intermediate rings for every multiple lengths	
6.3	Submerged Arc Weld Tests (For submerged Arc welded pipes)	6.3, 6.3.1.1 6.3.1.2, Fig.1,2	IS 5504	R	Four	Each Control Unit	
7	Hydrostatic test	**7,** 10	IS 5504	R	Each Pipe	Each pipe	Records of pipes repaired shall be maintained.
8	Permissible Variation in Dimensions i) Lengths, Diameters ii) Thickness and Ovalities	8.1, 8.2, 8.2.1, 8.2.2, 8.2.3	IS 5504	R	One	Every Hour (for pipes of each size)	In case the sample fails in further retesting then each pipe shall be checked for conformance before marking.
9	Finish	9.9.1	IS 5504	R	Each Pipe	Each Pipe	
11	Protective Coating to outside surface (if provided)	11	IS 5504	R	Each Pipe	Each Pipe	If specified by the purchaser.

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

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 Specification for Spiral Welded Pipes

TEST CERTIFICATE No._____ DATE_____

TO M/s_____

We certified that the material described below fully conforms to IS 5504:1997 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 LicenceNo.CM/L_____ are as indicated below against each order No.

(PLEASE REFER TO IS 5504:1997 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order No. & Date	Nominal OD and Thickness	Control Unit No.	Qty in tonnes	Length, Ovality	No. of pipes	Mechanical Properties			Chemical composition	Bend Test[#]	Hydrostatic test	Flattening[@]	Coating*	Optional*
						YS	%EL	UTS						

[#] SAW Pipes. [@]ERW Pipes

* as required by purchaser

REMARKS

WAGON NO.

TRUCK NO.

FOR XYZ IRON AND STEEL COMPANY

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