

**PRODUCT MANUAL FOR  
Cold-Reduced Tinmill Products -- Electrolytic Tin Plate  
according to IS 1993:2018**

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 1993:2018</b>
	<b>Title</b>	:	Cold-Reduced Tinmill Products -- Electrolytic Tin Plate
	<b>No. of amendments</b>	:	0
2.	<b>Sampling Guidelines</b>		
a)	<b>Raw material</b>	:	No specific requirement
b)	<b>Grouping Guidelines</b>	:	Please refer Annex – A
c)	<b>Sample Size</b>	:	For mechanical test: 1 metre 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>	:	All tests
6.	<b>Scope of the Licence :</b>		
	Licence is granted to use Standard Mark as per IS 1993:2018 with the following scope:		
	<b>Name of the product</b>	Cold-Reduced Tinmill Products -- Electrolytic Tin Plate	
	<b>Designations</b>		
	<b>Thickness Range</b>		
	<b>Width range</b>		
	<b>Mass of tin coating range</b>		
	<b>Finish</b>		

**ANNEX A**  
**TO PRODUCT MANUAL FOR**  
**Cold-Reduced Tinmill Products -- Electrolytic Tin Plate**  
**According to IS 1993:2018**

**GROUPING GUIDELINES**

The following procedure to be adopted towards grant of licence and inclusion of additional varieties:

1. Grouping has been done on the basis of mechanical properties and degree of cold working for designations defined on hardness values and on the basis of proof strength for designations defined on tensile properties as under:

<b>Group</b>	<b>Product</b>	<b>Designations covered in the group</b>
1	Designations of Single cold-reduced tinplate classified on basis of hardness values(HR30Tm)	T49, T53, T55, T57, T59, T61 , T65.
2	Designations of Double cold-reduced tinplate classified on basis of hardness values(HR30Tm)	T71, T72, T73, T75, T76.
3	Designations of Single/Double cold-reduced tinplate classified on tensile property and requiring Batch Annealing(BA) or Continuous Annealing(CA)	TS200,TS230,TS245,TS260,TS275,TS290,TS340,TS480,TS520,TS550, TS 580, TS620  TH230,TH245,TH260,TH275,TH300,TH330,TH350,TH385,TH400,TH415,TH435,TH450,TH480,TH520,TH550,TH580.

2. In case of GOL/inclusion for group-1 or group-2, one sample of any thickness but of higher hardness shall be drawn and tested to cover all the designations of the product within the group.

3. In case of GOL/inclusion for group-3, one sample each of higher proof strength and of lower proof strength shall be drawn and tested to cover all the designations of the product within the group. The samples drawn shall be of any thickness and of BA or CA.

4. In addition, the above samples drawn from each group, as applicable, shall be of higher tin coating mass regardless of equal coating or differential coating. In case of differential coating, the higher tin coating mass forms the criterion for specifying range of tin coating mass for the group in the scope of licence.

5. For testing of imperfections and tolerances on Dimensions and shapes such as feather edge, width, length, edge camber, out of squareness (for sheets), Joints within a coil one sample of any size, of each group intends to be covered in the licence may be tested in the factory. Separate samples are not required to be tested for physical parameters for each size/designation.

6. However, while considering inclusion of a new variety (designation), licensee shall submit factory test report for physical parameters if the physical parameters are different from the ones already tested.

7. While drawing samples for independent testing, applicable declaration as per cl. 7.1(Annex-C), 7.2 and 7.3 of IS 1993:2018 may be obtained and reflected in the test request appropriately.

8. If the samples drawn passes, licence may be granted/inclusion be done for the Designations of the Group. However, it shall be ensured that the firm is having all necessary manufacturing capabilities and testing facilities for the Designations against the range of thickness, range of width, finish and type of annealing intended to be included in the licence.

9. During the operation of license, BO shall ensure that all Grades & Designations covered in the license are drawn for independent testing on rotation over a period of time

**ANNEX 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	Test Used in With Clause Reference
1	Digital Vernier	Tolerances on dimensions and shape(10)
2	Steel Scale	
3	Measuring tape	
4	Wedge Scale	
5	Digital Micrometer	
6	Measuring Table	
7	Flatness table	
9	Stannometal ( method for fast estimation) Make: Quality By Vision	Tin coating mass(8)
10	Rockwell Hardness tester	hardness measurement (9.2)
11	Springback Test apparatus/ Tensile testing machine/ Oven	Tensile Property requirement (9.3)
13	Hydrochloric acid, Iron(III) chloride, Potassium Iodate, Starch, Diethyl ether, Platinum wire, Al Foil, Carbon Dioxide(oxygen free), cellulose Lacquer, 500 ml wide-neck conical flask fitted with a rubber bung containing a bent gas inlet tube, a small Liebig-type condenser and a rubber-sealed tube for burette entry at the titration stage, hot plate.	Tin Coating mass (8) as per Annex-F.3
14	Hydrochloric acid(5%), Distilled Water Apparatus: Cell and electrodes- a platinum gauze or platinized titanium cathode and a suitable reference electrode, power supply- current in the range 3 mA to 100 mA, voltmeter- 0 V to $\pm 2$ V, and from which an output can be taken to a y-t recorder	Tin Coating mass (8) as per Annex-F.2

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

**ANNEX C**  
**To Product Manual for**  
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**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 & MARKING** – The Standard Mark as given in the 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 requirement of the specification.

**4. CONTROL UNIT** – For the purpose of this scheme, a control unit shall be taken as a single coil of one cast plated together under uniform conditions of production and upto a maximum of 10000 kg (10 tonnes).

**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 1993:2018 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. 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)		(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	Choice of a suitable physical or chemical analytical method for the analysis shall be at the discretion of the manufacturer. In cases of dispute, the method for analysis used shall be agreed considering the relevant Indian Standards					
	Cast Analysis	7.1, Annex-C	IS 1993: 2018	R	One	Each Heat	Applicable for manufacturers having steel making facilities. The chemical composition as declared by the manufacturer.
	Product Analysis	-do-	-do-	R	One	Each Cast	Applicable for manufacturers without steel making facilities. However, no testing is required if non-alloy quality steel used is ISI marked.
	Purity of Tin	7.1	IS 1993: 2018	R	Purity of tin used to produce coating shall not be less than 99.85%(mass fraction).		
7.3	Finish	7.3	IS 1993: 2018 IS 15263	S	One	Each coil/ package of sheets	As mutually agreed to between manufacturer and purchaser.
7.4	Passivation and Oiling	7.4	IS 1993: 2018	S	Requirements, Test method and frequency, etc as agreed to between manufacturer and purchaser		
7.5	Imperfections	7.5.1 7.5.2 3.6	IS 1993: 2018	R	Adequate inspection in the line of production and in the stacks to ensure freedom from defects. For verification of grades by random selection of samples as per Cl. 13 of the specification & examination of the surface as per Cl. 3.6 of Specification to be resorted to.		

8	Tin Mass coating	8,13, 14.1, Table-2	IS 1993: 2018	R	One	Each Control Unit	
9	Mechanical Properties						
	Hardness Requirement	9.2, 14.2 and Table A.1, A.2	IS 1993: 2018 IS 1586(Pt.1)	R	One	Each Control Unit	
	Tensile property requirement	9.3,14.3 & Table-B.1	IS 1993: 2018 IS 1608 (Pt.1)	R	One	Each Control Unit	
10	Tolerances on Dimensions and shape	10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, 14.4	IS 1993: 2018	R	Adequate measurement to ensure each coil/ package of sheets will conform to the various requirements and specified tolerances but in no case frequency will be less than two samples from the production of each coil/package of sheets.		
11	Joint within a coil	11.1 to 11.4	IS 1993: 2018	R	Adequate measurement to ensure that coils conform to the various requirements and specified tolerances.		
12	Marking of differentially coated cold-reduced tinplate	12.1 to 12.4	IS 1993: 2018	R	Unless otherwise agreed tinplate with equal coatings shall be marked on the two surfaces, differentially coated tinplate shall be marked on one surface only.		

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.

**ANNEXURE I**

(Para 6 of the Scheme of Inspection and Testing)

XYZ STEEL COMPANY

(Registered office Address and works address)

**TEST CERTIFICATE FOR COLD-REDUCED TINMILL PRODUCTS --ELECTROLYTIC TIN PLATE  
According to IS 1993:2018**



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

DATE \_\_\_\_\_

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

We certified that the material described below fully conforms to 1993:2018, for Physical properties of the product and with Chemical composition as declared below, as tested in accordance with the Scheme of Inspection and Testing contained in the BIS Certification Marks Licence No. CM/L \_\_\_\_\_ are as indicated below against each order No.

(PLEASE REFER TO IS 1993:2018 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

**TEST RESULTS**

Order No. & Date	(nom Size)	Control Unit No.	designation	Quantity in tonnes	CHEMICAL COMPOSITION <sup>#</sup>					Dimensional Tolerances					Mechanical properties		Mm. avg of tin mass coating	Surface finish	
					C %	S %	P %	Si %	Mn %	thickness	width	length	Edge camber	flatness	Out of squareness	Proof stress			hardness

<sup>#</sup> as agreed between

REMARKS

WAGON NO.

TRUCK NO.

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

FOR XYZ STEEL COMPANY