

**PRODUCT MANUAL FOR
Hot-Dip Zinc Coating on Structural Steel Bars for Concrete Reinforcement
According to IS 12594:1988**

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 12594:1988
	Title	:	Hot-Dip Zinc Coating on Structural Steel Bars for Concrete Reinforcement
	No. of amendments	:	0
2.	Sampling Guidelines		
a)	Raw material	:	Steel bars for concrete reinforcement conforming to any of the grades among IS 2062, IS 432 Pt.1 & IS 1786. Zinc Ingots used for galvanizing shall conform to any of the grades specified in IS 209 or IS 13229.
b)	Grouping Guidelines	:	Please refer Annex - A
c)	Sample Size	:	For mechanical tests: 2 No.s of 2m length For chemical tests: 5 pieces of length 5 cm or 50 g drillings, 1 piece of length 1m for coating requirements
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	:	Mass of Zinc Coating, Freedom from defects, Adhesion of Zinc Coating, Chromating, Sheared Ends and Damaged Coating
6.	Scope of the Licence :		
	Licence is granted to use Standard Mark as per IS 12594:1988 with the following scope:		
	Name of the product	Hot-Dip Zinc Coating on Structural Steel Bars for Concrete Reinforcement	
	Coating Class	A, ...	
	Size	Thickness: from ...mm to ...mm	

ANNEXURE A
TOPRODUCT MANUAL FOR
Hot-Dip Zinc Coating on Structural Steel Bars for Concrete Reinforcement
According to IS12594:1988

GROUPING GUIDELINES

Grouping has been done on the basis of coating classes under:

1. From each Coating class of Hot-Dip Zinc Coating on Structural Steel Bars for Concrete Reinforcement, one sample of any size of higher coating class, shall be drawn for testing for covering the both coating classes
2. If a sample has been drawn and tested for higher durability class of material offered (e.g. class A), the recommendation shall include lower class (e.g. class B) also.
3. It shall be ensured that manufacturer is having complete manufacturing and testing arrangements required for the varieties to be covered in the licence.
4. During operation of licence, samples shall be drawn during surveillance visits on rotation basis so as to cover all grades included in the licence.
5. For change in scope of existing licence same procedure as mentioned above, for grant of licence holds applicable.

ANNEXURE B
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LIST OF TEST EQUIPMENTS

Major test equipment 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.	Weighing balance, Clean soft cotton cloth, Vernier Caliper, micrometer, Stripping method: Antimony trioxide / Antimony tri chloride, Conc.HCl, soft cotton cloth, solvent naphtha, trichloroethylene, alcohol, Distilled Water, 100 ml glass burette with stopcock, rubber tube, reservoir (for Volumetric method for using below 5mm nominal dia) and other glassware as applicable in addition to the reagents mentioned above.	Mass of Zinc coating(5.1)
2.	Vision-Based Inspection System	Freedom from Defects(5.2)
3.	Pivoted riveting hammer test set-up, stout knife	Adhesion of galvanized coating(5.3)
4.	Copper carbonate (laboratory grade) or Copper hydroxide (laboratory grade), Copper Sulphate Crystals – Technical grade, Ammonium Hydroxide, Alcohol, Distilled water, Volatile organic solvent such as ether, trichloroethylene, carbon tetrachloride, etc. and other chemicals and reagents applicable, brush, hydrometer, Room Air conditioner with temperature control facility, Thermometer.	Uniformity of zinc Coating(4.3)

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

ANNEXURE C
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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 PACKING & 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 and packing 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. 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, a control unit is defined as bars of one size furnished to same hot rolled bar specification that have been galvanized in a single production shift from one bath under essentially similar conditions.

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. TEST CERTIFICATE-For each consignment of BIS Certified material conforming to IS 12594:1988 there shall be a test certificate which shall contain the Standard Mark clearly stating for Zinc coating requirements only, 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. 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)		(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				
4.1	Quality of concrete reinforcement bars	4.1	IS 12594:1988 IS 1786, IS 2062, IS 432(Pt.1)	R	1	Each Cast	For a manufacturer with in-house facilities for producing bars and carrying out galvanizing.
				S	1	Each consignment	The bars shall necessarily be ISI marked and accompanied with test certificate. In such cases no further testing is required.
4.2	Quality of Zinc Coating	4.2	IS 12594:1988	S	1	Each Consignment	In case material is BIS certified or received with test certificate of the suppliers own lab or test certificate from NABL accredited lab indicating its conformity to relevant specification no further testing is required.
4.3	Uniformity in Thickness	4.3	IS 12594:1988 IS 2629 IS 2633	R	5	50 Tonnes or part thereof from each control unit	
5.1	Mass of Zinc Coating	5.1 6.2, Table-1	IS 12594:1988 IS 6745	R	-do-	-do-	
5.2	Freedom from defects	5.2	IS 12594:1988 IS 2629	R	Adequate inspection to ensure each item to be free from surface defects and Records of inspection shall be maintained.		

(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				
5.3	Adhesion of galvanized coating	5.3	IS 12594:1988 IS 2629	R	5	50 Tonnes or part thereof from each control unit	The coating shall be adherent and it shall not be affected /damaged by any reasonable process of handling or erection
8	Supplementary requirements of galvanized coating	8.1 8.2	IS 12594:1988	S	As agreed between manufacturer and 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 for approval by BO Head.

BIS STANDARD
MARK
(For Zinc
Coating Only)

ANNEXURE I

(Para 6 of the Scheme of Inspection and Testing)

XYZ STEEL COMPANY

(Registered office Address and works address)

TEST CERTIFICATE FOR Hot-Dip Zinc Coating on Structural Steel Bars for Concrete Reinforcement

TEST CERTIFICATE No. _____

DATE _____

To M/s _____ We certified that the material described below fully conforms to IS 12594:1988 Coating and Physical properties of the product, 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 12594:1988 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order No.	Dimensions	Reinforcement bar specification	Control Unit No.	Quantity (Tonnes)	class of coating	Galvanizing after or before fabrication	Coating requirements				Remarks
							Mass	Uniformity	Adhesion	Supplementary [#]	

[#]If required by purchaser

REMARKS

WAGON NO.

TRUCK NO.

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

FOR XYZ STEEL COMPANY