

PRODUCT MANUAL FOR

Cold rolled Non - Oriented Electrical steel sheet and strip - Semi-processed type
according to IS 15391:2003

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 15391:2003 |
| | Title | : | Cold rolled Non - Oriented Electrical steel sheet and strip - Semi-processed type |
| | No. of amendments | : | 3 |
| 2. | Sampling Guidelines | | |
| a) | Raw material | : | No specific requirement |
| b) | Grouping Guidelines | : | Please refer Annex – A |
| c) | Sample Size | : | 1. 20 pieces Epstein test strips (of 280-300 mm length & 30 mm width) 2. Sheet of 2m length Dimensional requirements on full width sample are usually tested in factory testing. |
| 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 | : | Dimensions and Tolerances, Surface condition. Magnetic Properties (in case samples subjected to reference condition in advance are available). |
| 6. | Scope of the Licence : | | |
| | Licence is granted to use Standard Mark as per IS 15391:2003 with the following scope: | | |
| | Name of the product | Grain Oriented Electrical Steel Sheet and Strip | |
| | Dimensions | Width upto ...mm Length upto ...mm (in case of sheets) Thickness: 0.50mm, 0.65mm. | |
| | Steel Designation | | |

ANNEXURE A
TO PRODUCT MANUAL FOR
Cold Rolled Non-Oriented Electrical Steel Sheet and Strip
Semi-Processed Type
According to IS 15391:2003

GROUPING GUIDELINES

PAGE 1 OF 1

1. Non-Grain Oriented Electrical Steel Sheet and Strip according to IS 15391: 2003 is classified on the basis of the following:

- Alloyed or Non-alloyed
- Nominal Thickness
- Maximum Specific Total Loss

2. Accordingly, following grouping based on quality of product, shall be followed for considering grant of licence/inclusion as per IS 15391:2003 :-

| Group | Grades | Remarks |
|-------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | 50-SP-500 D5, 50-SP-560 D5, 50-SP-660 D5, 50-SP-890 D5 & 50-SP-1050 D5 | One sample of grade with lower Maximum Specific Total Loss is drawn and tested, all other grades within the group having higher Maximum Specific Total Loss alongside the grade of lower Maximum Specific Total Loss, can also be covered in scope of licence. |
| 2 | 65-SP-800 D5, 65-SP-1000 D5 & 65-SP-1200 D5 | |
| 3 | 50-SP-340 E5, 50-SP-390 E5, 50-SP-450 E5, 50-SP-500 E5 & 50-SP-560 E5 | |
| 4 | 65-SP-390 E5, 65-SP-450 E5, 65-SP-520 E5 & 65-SP-630 E5 | |

3. It shall however be ensured that firm has necessary manufacturing capabilities and testing facilities for the entire grades/conditions proposed to be covered under scope of BIS Certification.

4. During the operation of license, BO shall ensure that all sizes / grades covered in the license are drawn for independent testing on rotation over a period of time.

ANNEXURE B
TO PRODUCT MANUAL FOR
Cold Rolled Non-Oriented Electrical Steel Sheet and Strip
Semi-Processed Type
According to IS 15391:2003

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. | Epstein Test Frame, Tesla meter (0-2.0T), Timer, Vernier Calipers, Frequency meter, Flux Volt meter, RMS Volt meter, Watt meter, RMS Ammeter, Ageing oven, Micrometer, Thermometer, Air conditioner with Heater, Shearing machine, Punching m/c, Weighing balance lab annealing furnace: with decarburizing atmosphere, with Temp indicator, heating rate not exceeding 200 ⁰ C, Cooling rate not exceeding 120 ⁰ C | Specific Total Loss (9.3) & Magnetic Polarization(9.2), 10.1(using 25cm Epstein frame) |
| 2. | Measuring tape, measuring scale, Micrometer, Long arm digital gauge, Straight edge, Depth gauge, Steel scale Taper Gauge, Surface plate, vernier callipers, | Dimensions and Tolerances(11) |
| 3. | Roughness Tester | Surface Condition(12) |

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

ANNEXURE C
TO PRODUCT MANUAL FOR
Cold Rolled Non-Oriented Electrical Steel Sheet and Strip
Semi-Processed Type
According to IS 15391:2003

SCHEME OF INSPECTION AND TESTING

Page 1 of 3

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. In addition, on top of package of Sheets and Strips, 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), shall be taken as single charge of the product of one or more casts heat-treated together with similar quality grading up to maximum weight of 5 tonnes or one mother coil whichever is higher.

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 Delivery Condition relating to the supply of material shall conform to cl 7 of IS 15391:2003.

6. TEST CERTIFICATE-For each consignment of BIS Certified material conforming to IS 15391:2003 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. Any rejected material which is potentially resalable 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.

ANNEXURE C
TO PRODUCT MANUAL FOR
Cold Rolled Non-Oriented Electrical Steel Sheet and Strip
Semi-Processed Type
According to IS 15391:2003
SCHEME OF INSPECTION AND TESTING

Page 2 of 3

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 | | | | |
| 8 | Dimensions and Tolerances | 8.1 to 8.7, 10.2, 11, Table-1 | IS 15391: 2003 IS 649 | R | One | Each control unit | |
| 9 | Magnetic Properties | | | | | | |
| | Specific Total Loss | 9.1 to 9.1.4, 9.3, 10 to 10.1.1, 11 Table-2&3 | IS 15391: 2003 IS 649 | R | One | Each control unit | |
| | Magnetic Polarization | 9.1 to 9.2, 10 to 10.1.1, 11 Table-2&3 | | R | One | Each control unit | |
| 12 | Surface Condition | 12 | IS 15391: 2003 | R | Adequate inspection to ensure each sheet/strip to be uniform and clean | | |
| | Roughness of the material | 12.1 | IS 15391: 2003 | R | One | Each 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: The control unit and levels of control as decided by the Bureau are obligatory to which the licensee shall comply with.

ANNEXURE I

Page 3 of 3

(Para 6 of the Scheme of Inspection and Testing)
XYZ IRON AND STEEL COMPANY
(Registered office Address and works address)

BIS
STANDARD
MARK

TEST CERTIFICATE FOR Cold Rolled Non-Oriented Electrical Steel Sheet and Strip Semi-Processed Type

TEST CERTIFICATE No. _____

DATE _____

TO M/s _____

We certified that the material described below fully conforms to IS 15391:2003 Magnetic and Physical properties of the product, as tested in accordance with the Scheme of Testing and Inspection contained in the BIS Certification Marks Licence No. CM/L _____ are as indicated below against each order No.

(PLEASE REFER TO IS 15391:2003 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

| Order No. & Date | Nominal Thickness and Size | Control Unit No. | grade | Qty in tonnes | No. of coils | Specific loss at 50 Hz, 1.5 T (W/Kg) | Magnetic Polarization in Tesla | Delivery Condition | Optional | Remarks |
|------------------|----------------------------|------------------|-------|---------------|--------------|--------------------------------------|--------------------------------|--------------------|----------|---------|
| | | | | | | | | | | |

REMARKS

WAGON NO.

TRUCK NO.

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

FOR XYZ IRON AND STEEL COMPANY