

PRODUCT MANUAL FOR
Grain Oriented Electrical Steel Sheet and Strip
according to IS 3024:2015

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 3024:2015
	Title	:	Grain Oriented Electrical Steel Sheet and Strip
	No. of amendments	:	1
2.	Sampling Guidelines		
a)	Raw material	:	No specific requirement
b)	Grouping Guidelines	:	Please refer Annex – A
c)	Sample Size	:	1. 40 pieces Epstein test strips (of 280-300 mm length & 30 mm width) 2. 500mm x 500 mm piece (for Single Sheet Tester) 3. 250 mm x 100 mm piece (10 pieces) 4. 20 pieces (280-300mm length & 30 mm width) 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	:	All Physical, Mechanical and Magnetic properties excluding specific core loss (on aged test pieces)
6.	Scope of the Licence :		
	Licence is granted to use Standard Mark as per IS 3024:2015 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)	
	Grade	23CG110,..	
	Condition	NF..	

ANNEXURE A
TO PRODUCT MANUAL FOR
Grain Oriented Electrical Steel Sheet and Strip
According to IS 3024:2015

GROUPING GUIDELINES

PAGE 1 OF 1

1. Grain Oriented Electrical Steel Sheet and Strip according to IS 3024: 2015 is classified on the basis of the following:

- Conventional grade or High permeability grade
- Nominal Thickness
- Maximum Specific Total Loss
- Domain Refinement (in case of High permeability grades)
- Delivery Condition

2. Accordingly, following grouping based on quality of product, shall be followed for considering grant of licence/inclusion as per IS 3024:2015 :-

A. Conventional Grades

Group	Grades	Remarks
1	23CG110,23CG120 23CG127	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	27CG120, 27CG130	
3	30CG130, 30CG140 30CG150	
4	35CG145, 35CG155 35CG165	
		If sample with higher insulation characteristic is tested eg F , then the samples with lower insulation characteristics eg NF, PQ may also be included in scope of licence.

B. High Permeability Grades

Group	Grades	Remarks
1	23HP75,23HP80 23HP85,23HP90 23HP95,23HP100	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	23HP75 ^d ,23HP80 ^d 23HP85 ^d ,23HP90 ^d 23HP95 ^d ,23HP100 ^d	
3	27HP85, 27HP90 27HP95, 27HP100 27HP110	If sample with higher insulation characteristic is tested eg F , then the samples with lower insulation characteristics eg NF, PQ may also be included in scope of licence.
4	27HP85 ^d , 27HP90 ^d 27HP95 ^d	
5	30HP95, 30HP100 30HP105, 30HP110 30HP120	
6	35HP110, 35HP115 35HP125, 35HP135	

3. In case insulation characteristics are substantially different than those listed in Table 3 of IS 3024:2015, declaration on specific requirement including procedure for evaluating them shall be obtained from the manufacturer.

4. 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.

5. 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
Grain Oriented Electrical Steel Sheet and Strip
According to IS 3024:2015

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, lab stress relieving furnace (reducing or neutral atmosphere) with Temp indicator, Weighing balance	Core Loss (8.1) & Magnetic Polarization(8.2), 14.1(using 25cm Epstein frame)
2.	Single Sheet tester, 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, lab stress relieving furnace (reducing or neutral atmosphere) with Temp indicator, Weighing balance	Core Loss (8.1) & Magnetic Polarization(8.2), 14.5 (For domain refined grades)
3.	Franklin tester with Test Head, Press, Pressure Gauge , Ammeter, Voltmeter Hot Plate, Weighing machine, Vernier callipers, thermometer	Surface Insulation characteristics (9)
4.	Compression device/CTM Pressure gauge Vernier caliper/dial gauge, Weighing machine Rigid metal plates	Stacking factor (10.1)
5.	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)
6.	Bend tester/Thinner brake with apron brake & with hand folder Measuring tape	Ductility (10.2)
7.	Weigh Bridge	Packaging(18)

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

ANNEXURE C
TO PRODUCT MANUAL FOR
Grain Oriented Electrical Steel Sheet and Strip
According to IS 3024:2015

SCHEME OF INSPECTION AND TESTING

Page 1 of 4

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 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 General requirements relating to the supply of material shall conform to IS 8910 and cl 7 of IS 3024:2015.

6. TEST CERTIFICATE-For each consignment of BIS Certified material conforming to IS 3024:2015 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 re-salable be sheared or cut or deformed in such a manner that it cannot be used for the construction of transformer core . 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
 Grain Oriented Electrical Steel Sheet and Strip
According to IS 3024:2015

SCHEME OF INSPECTION AND TESTING

Page 2 of 4

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	General Requirements and surface conditions	7.1	IS 3024: 2015	S	As agreed between manufacturer and purchaser		Records shall be maintained.
		7.2 to 7.5	IS 3024: 2015	R	Each Coil/Sheet	Each Coil/Sheet	
8	Magnetic Properties						
	Core loss	8.1,13, 14, 17	IS 3024: 2015 IS 649	R	One	Each control unit	
	Magnetic Polarization	8.2, 13, 14, 17		R	One	Each control unit	
9	Surface Insulation Resistivity	9.1 to 9.4,13, 17 Table-3	IS 3024: 2015 IS 649	R	One	Each control unit	
10	Physical & Mechanical Properties						
	Stacking Factor	10.1 , 13, 17 Table-4	IS 3024: 2015 IS 649	R	One	Each control unit	
	Ductility	10.2 to 10.2.2, 13, 17		R	One	Each control unit	

(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				
11	Dimensions & Tolerances	11.1 to 11.7,13, 17 Table-5	IS 3024: 2015	R	One	Each control unit	Whenever Setting of the machine is changed
12	Workmanship, Finish and Appearance	12.1 to 12.1.2	IS 3024: 2015	R	Each Coil/Sheet	Each Coil/Sheet	

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 4 of 4

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



TEST CERTIFICATE FOR Grain Oriented Electrical Steel Sheet and Strip

TEST CERTIFICATE No. _____

DATE _____

TO M/s _____

We certified that the material described below fully conforms to IS 3024:2015 Magnetic, Physical and Mechanical 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 3024:2015 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order No. & Date	Nominal Thickness and Size	Control Unit No.	grade	Qty in tonnes	No. of coils	Core loss at 50 Hz / 60Hz, 1.7 T (W/Kg)	Polarization in Tesla at a field strength of 800 A/m	IR (Ohm.-cm ² /La)	Stacking factor	Ductility	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