



उत्पाद मानुयल
चुंबकीय सामग्रियाँ – वैयक्तिक सामग्रियाँ
की विशिष्टि अर्ध प्रक्रमित
अवस्था में दिए गए लौहा आधारित अमोर्फस स्ट्रिप
IS 16585:2023/IEC 60604-8-11:2018, MOD के अनुसार

PRODUCT MANUAL FOR
Magnetic Materials — Specification for Individual Materials
— Fe-Based Amorphous Strip
Delivered in the Semi-Processed State as per IS 16585:2023/IEC 60604-8-11:2018, MOD

भारतीय मानक ब्यूरो अनुरूपता मूल्यांकन विनियम की स्कीम-I के तहत यह उत्पाद मानुयल प्रमाणीकरणके प्रचलन में रीति और पारदर्शिता के सुसंगत सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों एवं लाइसेन्स धारियों द्वारा संदर्भ सामग्री के रूप में उपयोग किया जाएगा। बीआईएस लाइसेन्स/प्रमाण पत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज़ का उपयोग किया जा सकता है।

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.	उत्पाद Product	:	IS 16585:2023/IEC 60604-8-11:2018, MOD
	शीर्षक Title	:	Magnetic Materials — Specification for Individual Materials — Fe-Based Amorphous Strip Delivered in the Semi-Processed State
	संशोधन संख्या No. of amendments	:	NIL
2.	नमूनाकरण दिशा निर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	No specific raw material requirement
b)	समूहिकरण दिशा निर्देश Grouping Guidelines	:	Please see Annex-A

c)	नमूने का परिमाण Sample Size	:	a) For Magnetic Polarization and Specific Total Loss:- 1 Sheet of Length from 280 mm to 300 mm and Width equal to the delivery width of the strip b) For Thickness:- Rectangular specimen having a width of atleast 20 mm, a length of atleast 20 mm and a surface area of atleast 5000 mm² c) For Width:- Strip of a length of atleast 250 mm and width equal to the delivery width of the strip d) Edge Wave (wave factor) and Edge Camber:- Strip of length 2 m e) Residual Curvature: Strip of Length (500 ^{+2.5, - 0} mm), Width equal to the delivery width of the strip d) Stacking Factor:- 20 strips of width equal to the delivery width of the strip and length within the range of 75 mm to 125 mm within tolerance of ± 0.5 mm. e) Strip Tear Ductility:- Strip of a length corresponding to two times the casting roll circumference (If exact circumference is not known it can be assumed to be 1.2 m)
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer Annex – B
4.	निरीक्षण व परीक्षण स्कीम Scheme of Inspection and Testing	:	Please refer Annex - C
5.	एक दिन में संभावित परीक्षण Possible tests in a day	:	All tests are possible to be carried out in a day
6.	लाइसेन्स का कार्यक्षेत्र /Scope of the Licence :		
	IS 16585:2023 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेन्स निम्नलिखित कार्यक्षेत्रके लिए प्रदान किया जाता है Licence is granted to use Standard Mark as per IS 16585:2023 with the following scope:		
	Name of the product	Magnetic Materials — Specification for Individual Materials — Fe-Based Amorphous Strip Delivered in the Semi-Processed State	
	Steel Name	AM08-25S5-90, AM10-25P5-90, AM12-25S588.....	

		<i>In case of thickness other than 0.25 mm (0.020 to 0.030 mm), Grade Designation as per cl.5. of IS 16585:2023 shall be followed. For example: for a conventional grade of Fe-based Amorphous Strip of thickness 0.023 mm, Max specific total loss at 1,3 T of 0.08 W/kg and Min Stacking Factor 0.90, the Material Name shall be designated as AM-08-23S5-90</i>
	Nominal Thickness	0.020 mm, 0.021 mm, 0.022 mm,....., 0.030 mm
	Nominal Width	142.2 mm, 170.2 mm, 213.4 mm or any other nominal width as per agreement between manufacturer and purchaser

BUREAU OF INDIAN STANDARDS
 Manak Bhawan, 9, Bahadur Shah Zafar
 Marg, New Delhi – 110002

ANNEXURE A
TO PRODUCT MANUAL FOR
Magnetic Materials — Specification for Individual
Materials — Fe-Based Amorphous Strip Delivered in the
Semi-Processed State According to IS 16585:2023/IEC 60604-8-11:2018, MOD

GROUPING GUIDELINES

1. IS 16585:2023 covers both conventional and high permeability grades of Fe-based amorphous strip supplied in the semi-processed state, that is without final heat treatment, of nominal thickness 0.025 mm.
2. In addition to nominal thickness of 0.025 mm, the specified values given in Table 1 and Table 2 at 50 Hz also holds applicable to other sizes of nominal thicknesses in the range 0.020 mm to 0.030 mm .
3. Grouping has been done on the basis of grade and designation. Grouping has been considered based on permeability levels. i.e. the magnetic material is conventional or high permeability grade.
2. Grades corresponding to conventional Fe-based Amorphous Strip of Table 1 (IS 16585:2023) are considered in one group and the grades corresponding to High Permeability Grades of Fe-Based Amorphous Strip of Table 2 (IS 16585:2023) are considered in another group. In case of magnetic properties, the tests shall be made using a single sheet method in accordance with IS 16586:2023/IEC 60404-16 MOD.
3. One sample from each group as under, having the lowest specific total loss at 1.3T and 50 Hz and with highest stacking factor of any nominal width, of each nominal thickness in the range from 0.020 mm to 0.030 mm, and subjected to a magnetic annealing in accordance with the reference condition (see 7.1.1) shall be tested for all requirements of IS 16585:2023, for considering GOL/inclusion of the grades, nominal thicknesses and nominal widths within the group:

Group 1 Conventional Grades	Group 2 High Permeability Grades
AM-08-25S5-90	AM08-25P5-90
AM08-25S5-88	AM08-25P5-88
AM08-25S5-86	AM08-25P5-86
AM08-25S5-84	AM08-25P5-84
AM10-25S5-90	AM10-25P5-90
AM10-25S5-88	AM10-25P5-88
AM10-25S5-86	AM10-25P5-86
AM10-25S5-84	AM10-25P5-84
AM12-25S5-90	AM12-25P5-90
AM12-25S5-88	AM12-25P5-88
AM12-25S5-86	AM12-25P5-86
AM12-25S5-84	AM12-25P5-84
AM16-25S5-90	AM16-25P5-90
AM16-25S5-88	AM16-25P5-88
AM16-25S5-86	AM16-25P5-86
AM16-25S5-84	AM16-25P5-84

4. While considering Grant of licence/inclusion of additional varieties, it shall be ensured that the applicant/licensee has got complete manufacturing facilities and testing equipment for all the material names/nominal thicknesses/widths applied.
5. During the operation of license, BO shall ensure that all the material names/nominal thicknesses/widths covered in the licence are drawn for independent testing on rotation over a period of time.

ANNEXURE B
TO PRODUCT MANUAL FOR
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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.	Electronic Weighing Balance (L.C. 0.1 g), Steel Tape, Steel Ruler	Form of Supply, cl.6.2., Surface Condition, cl.6.4
2.	Single Sheet Tester with a mutual indicator for air flux compensation, non-inductive precision resistor for current measurement, Yoke, Windings, Magnetic Shield, Arbitrary Waveform Generator (Power Supply), Power Amplifier, Digitizer, Analog/Digital Convertors (A/D), Digital Signal Calculator, Signal Channels of Calibrated Pre-Amplifiers, Sample and Hold Circuits (S/H) Continuous Annealing Furnace with provision of application of Magnetic Field of at least 1600 A/m Strip Cutting Machines (Sample Preparation)	Magnetic Properties cl.7.1.,cl.7.1.1.,cl.7.1.2, cl.7.1.3
3.	Micrometer (L.C. 0.001 mm), Thickness Tester (L.C. 2 μ m), Electronic Weighing Balance (L.C. 0.01 g), Steel Tape, Steel Ruler	Thickness, cl.7.2.1
4.	Micrometer (L.C. 0.01 mm), Vernier Caliper (L.C. 0.01 mm)	Width, cl.7.2.2
5.	Stacking Factor Tester with arrangement of a ram and press, Weighing Balance (L.C. 1 g)	Stacking Factor, cl.7.3.2
6.	Arrangement for tearing of strip in 5 locations across width	Strip Tear Ductility, cl.7.3.3

Note 1: The above is an indicative list for the purpose of guidance only and may not be treated as exhaustive

ANNEXURE C
TO PRODUCT MANUAL FOR
Magnetic Materials — Specification for Individual Materials — Fe-Based Amorphous Strip Delivered in the Semi-Processed State
according to IS 16585:2023/IEC 60604-8-11:2018, MOD

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 and implement a calibration plan for the test equipment.
- 2. TEST RECORDS** - The manufacturer shall maintain test records for the tests carried out to establish conformity.
- 3. LABELLING, MARKING, PACKING** - The Standard Mark as given in schedule of the licence and Licence Number (i.e. CM/L) shall be incorporated on label/sticker/tag attached to each coil or on packaging of each coil and on the Test Certificate issued for each coil. The marking and packing shall be done as per the provisions of the Indian Standard, provided always that the product thus marked conform to all the requirements of the specification.
- 4. CONTROL UNIT** - For the purpose of this scheme each coil representing the same cast, grade (material name), nominal thickness and width shall constitute a 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.
- 6. TEST CERTIFICATE** - For each consignment of BIS certified material conforming to IS 16585:2023/IEC 60604-8-11:2018, MOD, there shall be a test certificate which shall contain the standard Mark, the coil number, grade, nominal thickness and width, delivery condition and the corresponding test results (as given in Annex I.)
- 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/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

Magnetic Materials — Specification for Individual Materials — Fe-Based Amorphous Strip Delivered in the Semi-Processed State
according to IS 16585:2023/IEC 60604-8-11:2018, MOD

(Para 5 of Scheme of Inspection and Testing)

(1)		(2)		(3)	(4)		(5)
Testing details		Test Method		Test equipment requirement R: required (or) S: Sub- contracting permitted	Levels of Control		Remarks
Cl	Requirements	Clause Ref.	IS No.		No. of samples	Frequency	
6	General Requirements	6.1 to 6.5	IS 16585/IEC 60404-8-11 MOD	R	Adequate inspection to ensure that each coil conforms to the requirements of the specification		
7.1	Magnetic Properties						
	Magnetic polarization	7.1.1 7.1.2 8.2,8.3.1 Table-1 & 2	IS 16586/IEC 60404-16 MOD	R	One	Each control Unit	----
	Specific total loss	7.1.1 7.1.3 8.2,8.3.1 Table-1 & 2	IS 16586/IEC 60404-16 MOD	R	One	Each control Unit	
7.2			Geometric Characteristics and Tolerances				
	Thickness	7.2.1 8.3.2 8.4.3.1	IS 16585/IEC 60404-11-8 MOD	R	One	1) On every change in width 2) On every change of grade (material name) 3) Every 500 th Coil irrespective of 1) and 2)	-----
	Width	7.2.2 8.3.2 8.4.3.2	IS 16585/IEC 60404-11-8 MOD	R	One	Each control Unit	
	Edge Camber	7.2.4 8.3.2 8.4.3.3	IS 16585//IEC 60404-11-8	R	One	Each control Unit	As agreed to between manufacturer and purchaser at the time of

			MOD IEC 60404-9				enquiry and order
	Edge Wave (wave factor)	7.2.5 8.4.3.4	8.3.2 IS 16585/IEC 60404-11-8 MOD IEC 60404-9	R	One	Each control Unit	As agreed to between manufacturer and purchaser at the time of enquiry and order
	Residual Curvature	7.2.6 8.4.3.5	8.3.2 IS 16585/IEC 60404-11-8 MOD IEC 60404-9	R	One	Each control Unit	As agreed to between manufacturer and purchaser at the time of enquiry and order
7.3	Technological Characteristics						
	Stacking factor	IS 16585/IEC 60404-11-8	IS 16585/IEC 60404-11-8	R	One	Each control unit	-----
	Strip Ductility Tear	7.3.3 8.3.3.2 8.4.4.2	IS 16585/IEC 60404-11-8	R	One	Each control unit	-----

ANNEXURE 1
LEVELS OF CONTROL
(Para 6 of Scheme of Inspection and Testing)

XYZ IRON AND STEEL COMPANY
(Registered office Address and works address)

TEST CERTIFICATE FOR Magnetic Materials — Specification for Individual Materials — Fe-Based Amorphous Strip Delivered in the Semi-Processed State
according to IS 16585:2023/IEC 60604-8-11:2018, MOD

TEST CERTIFICATE No. _____ DATE _____

TO M/s _____

It is certificated that the material described below fully conforms to IS 16585:2023/IEC 60604-8-11:2018, MOD Properties of the product, as tested in accordance with the Scheme of Testing and Inspection contained in the ISI Certification Marks Licence No. CM/L are as indicated against each order no etc.

Magnetic annealing condition is _____

(PLEASE REFFER TO IS 16585:2023 FOR DETAILS OF SPECIFICATION REQUIUREMENTS)

TEST RESULTS

Coil/ Spool Number	Nominal width & Thickness (mm)	Quantity (Tonne)	Stacking Factor	Ductility Code	Specific total loss (W/kg)		Magnetic Polarization at 80A/m (T)	Designation
					1.3T,50Hz	1.4T,50Hz		
							50Hz	

REMARKS

SIGNATURE:
DESIGNATION:
FOR XYZ IRON AND STEEL COMPANY