

*For comments only***BUREAU OF INDIAN STANDARDS**

*Draft* **AMENDMENT No. 2**  
**TO**  
**IS 3024:2006 GRAIN ORIENTED ELECTRICAL STEEL SHEET AND STRIP**  
**(SECOND REVISION)**

ICS 77.140.40

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Last date for receipt of  
 comments is **15 March 2010**

(Page 1, clause 3.14) -- Substitute the following for the existing:

'**Side Trimmed Coil** –Material is side trimmed on both edges condition in the range of widths produced by suppliers' manufacturing process.'

[Page2 clause 5.2, a)] -- Substitute the following for the existing:

'a) Conventional grain oriented electrical steel tested at 1.7 Tesla values of maximum specific core losses are given in table 1 and the values of maximum specific core losses at 1.5 Tesla given in table 1 are for information only.'

(Page 3, Table 1) - Substitute the following table for the existing:

**Table 1 Magnetic Properties of Conventional Grain Oriented (CGO) Electrical Steel  
 Tested at 1.7 Tesla and 50 Hz**

(Clauses 4.2,5.2, 8.1 and 8.2 of IS 3024 : 2006)

Grade	Nominal Thickness in mm	Maximum Specific Core Loss (W/kg) Polarization at 1.5 T and 50 Hz	Maximum Specific Core Loss (W/kg) Polarization at 1.7 T and 50 Hz	Minimum Polarization in Tesla at a Field Strength of 800 Aim	Minimum Stacking Factor
23CG110	0.23	0.73	1.10	1.78	0.945
23CG120	0.23	0.77	1.20	1.78	0.945
23CG127	0.23	0.80	1.27	1.75	0.945
27CG120	0.27	0.80	1.20	1.78	0.950
27CG130	0.27	0.85	1.30	1.78	0.950
27CG140	0.27	0.89	1.40	1.75	0.950
30CG130	0.30	0.85	1.30	1.78	0.955
30CG140	0.30	0.92	1.40	1.78	0.955
30CG150	0.30	0.97	1.50	1.75	0.955
35CG145	0.35	1.03	1.45	1.78	0.960
35CG155	0.35	1.07	1.55	1.78	0.960
35CG165	0.35	1.11	1.65	1.75	0.960

**NOTES**

1 The above samples are sheared longitudinal to the rolling direction and then stress relief annealed in a neutral or reducing atmosphere to develop magnetic property at 780°C to 820°C.



2 The values of Maximum Specific Core Loss (W/Kg) at 1.5 T are for information only.

Doc: MTD 4 (5008)

(Page 4, Table 2) -- Substitute the following table for the existing:

**Table 2 Magnetic Properties of High Permeability Grain Oriented (HPGO) Electrical Steel Tested at 1.7 Tesla and 50 Hz**  
(Clauses 5.2, 8.1 and 8.2 of IS 3024 : 2006)

Grade	Nominal Thickness in mm	Maximum Specific Core Loss (W/kg) Polarization at 1.7 T and 50 Hz	Minimum Polarization in Tesla at a Field Strength of 800 Aim	Minimum Stacking Factor
(1)	(2)	(3)	(4)	(5)
23HP85 <sup>d</sup>	0.23	0.85	1.85	0.945
23HP90 <sup>d</sup>	0.23	0.90	1.85	0.945
27HP90 <sup>d</sup>	0.27	0.90	1.85	0.950
27HP95 <sup>d</sup>	0.27	0.95	1.85	0.950
27HP100	0.27	1.00	1.88	0.950
27HP110	0.27	1.10	1.88	0.950
30HP105	0.30	1.05	1.88	0.955
30HP110	0.30	1.10	1.88	0.955
35HP115	0.35	1.15	1.88	0.960
35HP125	0.35	1.25	1.88	0.960
35HP135	0.35	1.35	1.88	0.960

NOTES 1<sup>d</sup> This grade may be delivered in domain refined condition. The magnetic properties of some domain refined material may deteriorate when the material is subjected to heat treatment.

2 The domain refined grades needs to be checked by single sheet method as in clause 14.3

(Page 4, Table 3, column 4, heading) -- Substitute 'ohm – cm<sup>2</sup> / Lamination' for 'ohm – cm<sup>2</sup>'

(Page 5, clause 10.2) -- Substitute the following for the existing:

**10.2 Ductility**

This test can be carried out by one of two methods described below:

**10.2.1** The ductility shall be (*same as present form*).....the width to 610 mm.

**10.2.2** This alternate test method consists of bend test , following the method/apparatus described in IS 649 section 8, clause xx. at room temperature

The minimum number of bends is one. The value applies to the parallel to the direction of rolling.

(Page 5, clause 11.2) – Insert the following in the last :

' , for widths up to & including 1000mm. For materials supplied with as rolled edges and /or widths above 1000 mm the tolerances on nominal width should be the subject of agreement while ordering.'



(Page 6, Table 5) -- Substitute the following table for the existing:

**Table 5 Width Tolerance**  
(Clause 11.2)

SI No.	Nominal Width, /	Tolerances
(1)	(2)	(3)
i)	≤150	+0.2 -0.0
ii)	150 ≥300	+0.3 -0.0
iii)	300 ≥600	+0.5 -0.0
iv)	600 ≥1000	+1.0 -0.0
v)	1000 ≥1250	+1.5 -0.0

NOTE- As per agreement, width Tolerance can be -ve or +ve or both -ve and +ve subject to tolerance band as above table.

(Page 6, clause 14) --- Insert the following as new subclauses:

**14.3** In the case where the measurement of magnetic polarization and specific core loss shall be made using single sheet method as specified in IS 649 : 1997 (this has been added as an Amendment), the test specimen for the single sheet taster shall consist of one sheet having the following dimensions.  
- length 500 mm to 530mm Note the value of 500 mm is recommended.  
- Width 500 mm + 0 / - 5 mm.

All the test specimen shall be cut parallel to the direction of rolling. The permitted tolerance for the angle between the direction of rolling and the direction of cutting is ± 1 degree.

**14.4** In case of measurements of specific core loss on aged test pieces, these shall be aged by heating at 225° C ± 5° C for duration of 24 hours and shall be cooled to ambient temp. `

(Page 6, clause 15) -- Insert the following as new subclause:

**15.4** The required tests for domain refined grades, core loss to determine the core loss type (and for exciting current and peak permeability, when determined) shall be made accordance with the test method described in IS 649, by means of a single sheet tester.



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Sl.No.	Clause / Subclause / Para No. commented	Comments / Suggestions
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