



Standard Classification of Insulating Coatings for Electrical Steels by Composition, Relative Insulating Ability and Application¹

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1. Scope

1.1 This document classifies insulating coatings for electrical steels according to their composition, relative insulating ability, and functionality. The purpose of this classification is to assist users of insulating coatings by providing general information about the chemical nature and use of the coatings, as well as to provide important data concerning limits to their use, that is, relative insulating ability, punchability, temperature stability, weldability, and fabricability. Specific surface insulation resistivity values for each coating are not included in this classification. The user is referred to the flat-rolled electrical steel specifications noted in 1.2 should more detailed information concerning surface insulation resistivity values be required.

1.2 This classification is to be used in conjunction with the various specifications for flat-rolled electrical steels under the jurisdiction of Committee A06, including Specifications A345, A677, A683, A726, A840, and A876. However, in those instances in which the coating descriptions and characteristics differ between this classification and any of the specifications, this classification shall supersede the specification.

1.3 The values stated in customary (cgs-emu and inch-pound) units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units which are provided for information only and are not considered standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

¹ This classification is under the jurisdiction of ASTM Committee A06 on Magnetic Properties and is the direct responsibility of Subcommittee A06.02 on Material Specifications.

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2. Referenced Documents

2.1 *ASTM Standards:*²

- A340 Terminology of Symbols and Definitions Relating to Magnetic Testing
- A345 Specification for Flat-Rolled Electrical Steels for Magnetic Applications
- A677 Specification for Nonoriented Electrical Steel Fully Processed Types
- A683 Specification for Nonoriented Electrical Steel, Semi-processed Types
- A717/A717M Test Method for Surface Insulation Resistivity of Single-Strip Specimens
- A726 Specification for Cold-Rolled Magnetic Lamination Quality Steel, Semiprocessed Types
- A840 Specification for Fully Processed Magnetic Lamination Steel (Withdrawn 2011)³
- A876 Specification for Flat-Rolled, Grain-Oriented, Silicon-Iron, Electrical Steel, Fully Processed Types
- A937/A937M Test Method for Determining Interlaminar Resistance of Insulating Coatings Using Two Adjacent Test Surfaces

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *interlaminar resistance, n*—the average resistance of two adjacent insulating surfaces in contact with each other, in accordance with Test Method A937/A937M.

3.1.2 *stress-relief anneal, n*—heat treatment that improves the magnetic properties of electrical steel by relieving internal stresses which are introduced during fabrication of magnetic cores.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For Annual Book of ASTM Standards volume information, refer to the standard's Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.