



# Standard Test Method for Alternating-Current Magnetic Properties of Amorphous Materials at Power Frequencies Using Wattmeter-Ammeter- Voltmeter Method with Sheet Specimens<sup>1</sup>

This standard is issued under the fixed designation A 932/A932M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This test method covers tests for various magnetic properties of flat-cast amorphous magnetic materials at power frequencies (50 and 60 Hz) using sheet-type specimens in a yoke-type test fixture. It provides for testing using either single- or multiple-layer specimens.

NOTE 1—This test method has been applied only at frequencies of 50 and 60 Hz, but with proper instrumentation and application of the principles of testing and calibration embodied in the test method, it is believed to be adaptable to testing at frequencies ranging from 25 to 400 Hz.

1.2 This test method provides a test for specific core loss, specific exciting power and ac peak permeability at moderate and high flux densities, but is restricted to very soft magnetic materials with dc coercivities of 0.07 Oe [5.57 A/m] or less.

1.3 The test method also provides procedures for calculating ac peak permeability from measured peak values of total exciting currents at magnetic field strengths up to about 2 Oe [159 A/m].

1.4 Explanation of symbols and abbreviated definitions appear in the text of this test method. The official symbols and definitions are listed in Terminology A 340.

1.5 This test method shall be used in conjunction with Practice A 34/A 34M.

1.6 The values stated in either customary (cgs-emu and inch-pound) or SI units are to be regarded separately as standard. Within this standard, SI units are shown in brackets. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with this standard.

1.7 *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.*

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee A06 on Magnetic Properties and is the direct responsibility of Subcommittee A06.01 on Test Methods.

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## 2. Referenced Documents

### 2.1 ASTM Standards:

A 34/A 34M Practice for Sampling and Procurement Testing of Magnetic Materials<sup>2</sup>

A 340 Terminology of Symbols and Definitions Relating to Magnetic Testing<sup>2</sup>

A 343 Test Method for Alternating-Current Magnetic Properties of Materials at Power Frequencies Using Wattmeter-Ammeter-Voltmeter Method and 25-cm Epstein Frame<sup>2</sup>

A 804/A804M Test Methods for Alternating-Current Magnetic Properties of Materials at Power Frequencies Using Sheet-Type Test Specimens<sup>2</sup>

A 876/A 876M Specification for Flat-Rolled, Grain-Oriented, Silicon-Iron, Electrical Steel, Fully Processed Types<sup>2</sup>

A 901 Specification for Amorphous Magnetic Core Alloys, Semi-Processed Types<sup>2</sup>

A 912 Test Method for Alternating-Current Magnetic Properties of Amorphous Materials at Power Frequencies Using Wattmeter-Ammeter-Voltmeter Methods with Toroidal Specimens<sup>2</sup>

C 693 Test Method for Density of Glass by Buoyancy<sup>3</sup>

## 3. Terminology

3.1 The definitions of terms, symbols, and conversion factors relating to magnetic testing, used in this test method, are found in Terminology A 340.

### 3.2 Definitions of Terms Specific to This Standard:

3.2.1 *sheet specimen*—a rectangular specimen comprised of a single piece of material or parallel multiple strips of material arranged in a single layer.

3.2.2 *specimen stack*—test specimens (as in 3.2.1) arranged in a stack two or more layers high.

## 4. Significance and Use

4.1 This test method provides a satisfactory means of determining various ac magnetic properties of amorphous magnetic materials. It was developed to supplement the testing

<sup>2</sup> Annual Book of ASTM Standards, Vol 03.04.

<sup>3</sup> Annual Book of ASTM Standards, Vol 15.02.