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Superseding AMS7510/1A	

Magnets, Rare-Earth/Cobalt, Permanent  
Samarium-Cobalt, 33/67 - 15 (119) 250

#### RATIONALE

AMS7510/1B has been reaffirmed to comply with the SAE five-year review policy.

#### 1. SCOPE

##### 1.1 Form

This specification covers one type of samarium-cobalt permanent magnet.

##### 1.2 Application

This product has been used typically for components of electrical, electronic, and magnetic devices requiring an energy level of 15 MGOe (119 kT·A/m) for use at service temperatures up to 250 °C, but usage is not limited to such applications.

##### 1.3 Classification

Nominal composition of 33% samarium and 67% cobalt with an energy level of 15 MGOe (119 kT·A/m) with 250 °C maximum service rating.

#### 2. APPLICABLE DOCUMENTS

See AMS 7510.

#### 3. TECHNICAL REQUIREMENTS

##### 3.1 Basic Specification

The complete requirements for procuring the magnets described herein shall consist of this document and the latest issue of the basic specification, AMS 7510.

##### 3.2 Composition

Shall be nominally 33% samarium and 67% cobalt. Composition variations will be permitted if the magnetic properties are met.

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### 3.3 Condition

Shall be unmagnetized.

### 3.4 Magnetic Characteristics

Hysteresis data, determined at  $25^{\circ}\text{C} \pm 5$ , shall be as follows:

3.4.1	Required magnetizing field, $H_s$ , minimum	20 kOe	1592 kA/m
3.4.2	Energy product level, $(BH)_m$ , nominal	15 MGOe	119 kT·A/m
3.4.3	Residual flux density (induction), $B_r$	7.8 - 8.2 kG	0.78 - 0.82 T
3.4.4	Induction coercive force, $H_c$	6.8 - 7.2 kOe	541 - 573 kA/m
3.4.5	Intrinsic coercive force, $H_{ci}$ , minimum	15 kOe	1194 kA/m

### 3.5 Permanent Magnet Performance as a Function of Temperature

Shall be as follows:

#### 3.5.1 Reversible coefficient, nominal, when $B/H = 1.0$

25 to 100 °C	0.040% per degree C
25 to 250 °C	0.048% per degree C

#### 3.5.2 Irreversible loss after exposure to temperature noted, nominal

100 °C, when $B/H = 1.0$	0.8%
100 °C, when $B/H = 0.25$	1.8%
250 °C, when $B/H = 1.0$	3.0%
250 °C, when $B/H = 0.25$	10.0%

### 3.6 Individual Magnetic Component Evaluation

Shall be as specified on the applicable drawing or product specification.

### 3.7 Physical, Thermal, and Electrical Properties

Nominal properties shall be as follows:

3.7.1	Tensile Strength	5 ksi (34.5 MPa)
3.7.2	Hardness	500 HV/10/30
3.7.3	Density	8.2 g/cm <sup>3</sup>
3.7.4	Resistivity, at 25°C	50μΩ · cm
3.7.5	Thermal Conductivity	0.025 (cal·cm)/(°C·sec·cm <sup>2</sup> )