



AEROSPACE MATERIAL SPECIFICATION

AMS7311™

REV. H

Issued	1948-05
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Noncurrent	2004-01
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Stabilized	2017-08

Superseding AMS7311G

Piston Rings, Centrifugally-Case Alloyed Iron
0.50Mo - 0.50Cu

RATIONALE

AMS7311H has been stabilized as mature technology.

STABILIZED NOTICE

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NOTE: In many cases, the purchaser may represent a sub tier supplier and not the cognizant engineering organization.

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Documents
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1. SCOPE:

1.1 Type:

This specification covers a centrifugally-cast, alloyed iron in the form of sleeves for the fabrication of piston rings.

1.2 Application:

Primarily for use as top compression rings in aircraft piston engines. Rings usually require chromium plating for compatibility with the cylinder barrel material.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The applicable issue of referenced publications shall be the issue in effect on the date of the purchase order.

2.1 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM A 247	Evaluating the Microstructure of Graphite in Iron Castings
ASTM E 8	Tension Testing of Metallic Materials
ASTM E 8M	Tension Testing of Metallic Materials (Metric)
ASTM E 18	Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E 351	Chemical Analysis of Cast Iron - All Types

2.2 U.S. Government Publications:

Available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, Pa 19111-5094.

2.2.1 Military Standards:

MIL-STD-794	Parts and Equipment, Procedures for Packaging and Packing of
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3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the following percentages by weight, determined on specimens as in 4.3.1 by wet chemical methods in accordance with ASTM E 351, by spectrochemical methods, or by other analytical methods acceptable to purchaser:

	min	max
Total Carbon	2.85	- 3.50
Manganese	0.50	- 1.00
Silicon	1.00	- 1.65
Phosphorus	- -	0.30
Sulfur	- -	0.12
Molybdenum	0.35	- 0.65
Copper	0.35	- 0.65

3.2 Condition:

Rings shall be supplied in the following condition:

3.2.1 Fabrication: Rings shall be machined from centrifugally-cast sleeves which have been annealed, hardened, and tempered.

3.2.2 Finish: Sides of rings shall be ground or lapped. Periphery shall be turned smooth.

3.3 Properties:

Shall conform to the following requirements:

3.3.1 Test Specimens: Shall be as follows, determined on specimens prepared as in 4.3.2:

3.3.1.1 Tensile Strength: Shall be not lower than 88,000 psi (607 MPa), determined in accordance with ASTM E 8 or ASTM E 8M.

3.3.1.2 Modulus of Elasticity: Shall be not lower than 20,000,000 psi (138 GPa), determined in flexure by applying a steadily increasing load to the 0.260 inch (6.60 mm) face of the specimen.

3.3.1.3 Hardness: Shall be 24 - 30 HRC, or equivalent, determined in accordance with ASTM E 18.

3.3.2 Finished Rings: Shall meet the following requirements:

3.3.2.1 Hardness: Shall be 24 - 30 HRC, or equivalent, determined in accordance with ASTM E 18.