



AEROSPACE MATERIAL SPECIFICATION

AMS7310™**REV. L**

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Superseding AMS7310K

Rings, Piston, Cast Iron
As Cast

RATIONALE

AMS7310L has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE

1.1 Form

This specification covers piston rings fabricated from cast iron.

1.2 Application

These rings have been used typically as compression rings, oil scraper rings, and dual oil control rings in aircraft engines, but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM A 247	Evaluating the Microstructure of Graphite in Iron Castings
ASTM E 18	Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E 351	Chemical Analysis of Cast Iron - All Types

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Documents

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3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 351, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - COMPOSITION

Element	min	max
Total Carbon	3.50	3.90
Silicon	2.20	3.10
Manganese	0.40	0.80
Phosphorus	0.30	0.80
Sulfur	--	0.13

3.1.1 Alloying elements may be added, with the approval of purchaser, to produce a high quality iron meeting the requirements of 3.3 and 3.4.

3.2 Fabrication

Rings shall be machined from castings in the as-cast condition.

3.2.1 Finish

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

3.3 Properties

Rings shall conform to the following requirements:

3.3.1 Finished Rings

3.3.1.1 Hardness

Shall be 77 to 91 HRG or equivalent (See 8.2), determined in accordance with ASTM E 18.

3.3.1.2 Microstructure

Shall be free from abnormal segregation. Matrices shall be essentially fine pearlite with no appreciable amounts of massive cementite, determined in accordance with ASTM A 247. Both phosphide eutectic and graphite shall be evenly distributed and the latter shall be present primarily in the form of randomly oriented flakes.

3.3.1.3 Circularity

The diameter through the gap shall exceed the diameter 90 degrees from the gap by not less than 0.0025 inch per inch (0.0025 mm/mm) of nominal ring diameter when finished ring is held around its periphery by a flexible steel band 0.0045 to 0.0055 inch (0.114 to 0.140 mm) thick and of a width approximately equal to that of the ring and whose inside circumference is equal to the nominal outside circumference of the ring ± 0.003 inch (± 0.08 mm).

3.3.1.4 Light-Tightness of Periphery

When finished ring is placed in a circular gage whose ID is equal to the nominal OD of the ring ± 0.0005 inch (± 0.013 mm), the portion of the periphery on each side of the gap equal to 20% of the nominal OD of the ring shall be light-tight. The space between the balance of the ring periphery and ID of gage shall be not greater than 0.0005 inch (0.013 mm) at any point and not less than 85% of the periphery of the ring shall be light-tight. Intermittent or fuzzy light shall be considered the same as light-tight.