

AERONAUTICAL MATERIAL SPECIFICATION

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RINGS, SEALING, SYNTHETIC RUBBER Oil Resistant (65-75)

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. **FORM:** Molded rings.
3. **APPLICATION:** Sealing rings for use at temperatures as low as -65 F, where resistance to hot lubricating oil is required. The cross-section of such rings is usually not over 3/16 in. in diameter or thickness.
4. **TECHNICAL REQUIREMENTS:**
 - 4.1 **Corrosion:** The product shall not have a corrosive effect on other materials when exposed to conditions normally encountered in service. Discoloration of metal shall not be considered objectionable.
 - 4.2 **Properties:** The product shall conform to the following requirements; tests shall be performed on the product supplied and in accordance with listed ASTM methods, insofar as practicable. The ASTM methods for manufacturing specimens do not apply, except for compression set discs. Tensile strength testing is not required on rings which, after cutting, are too short to permit testing. Eliminating tensile testing does not eliminate testing for elongation; elongation test can be made by stretching a ring over a mandrel of a size which will stretch the ring sufficiently to produce the required elongation when figured on the inside diameter of the ring.
 - 4.2.1 **As Received:**

4.2.1.1 Hardness, Durometer "A" or equiv.	70 $\pm$ 5	
4.2.1.2 Tensile Strength, psi, min	1500	ASTM D412-51T
4.2.1.3 Elongation, %, min	150	ASTM D412-51T
4.2.2 Lubricating Oil Resistance: (Immediate Deteriorated Properties)		ASTM D471-52T
		Medium: ASTM Oil No. 1
		Temperature: 300 F $\pm$ 2
		Time: 96 hr
4.2.2.1 Hardness Change, Durometer "A" or equiv.	-5 to +10	
4.2.2.2 Tensile Strength Reduction, %, max (based on area before immersion)	60	
4.2.2.3 Elongation Reduction, %, max	50	
4.2.2.4 Volume Change (Method A), %	0 to +10	
4.2.2.5 Decomposition	None	
4.2.2.6 Surface Tackiness	None	

4.2.2.7 If impracticable to determine tensile strength of rings 0.5 in. and less nominal ID after oil immersion, the rings shall withstand, without cracking, closing flat.

4.2.3 Processing Oil Resistance:
(Immediate Deteriorated Properties)

ASTM D471-52T

Medium: ASTM Oil No. 3

Temperature: 300 F $\pm$ 2

Time: 70 hr

4.2.3.1 Hardness Change, Durometer "A"
or equiv.

-20 to 0

4.2.3.2 Volume Change (Method A), %

+25 to +45

4.2.3.3 Decomposition

None

4.2.3.4 Surface Tackiness

None

4.2.4 Dry Heat Resistance:

ASTM D573-52

Temperature: 212 F $\pm$ 2

Time: 70 hr

4.2.4.1 Hardness Change, Durometer "A"
or equiv.

0 to +10

4.2.4.2 Tensile Strength Reduction, %, max

25

4.2.4.3 Elongation Reduction, %, max

40

4.2.4.4 Bend (flat)

No cracking
or checking

4.2.5 Compression Set:

ASTM D395-52T, Method B

Temperature: 250 F $\pm$ 2

Time: 70 hr

Compressed to 0.350 in. thick

Ø 4.2.5.1 ASTM Discs:

4.2.5.1.1 Per cent of original deflection,
max

50

4.2.5.1.2 Per cent of original thickness,
max

15

4.2.5.2 Parts: Compression set shall be determined on parts except that rings over 2 in. ID may be cut for testing. Cut specimens shall be approximately 1 in. long. Rings or specimens shall be compressed to 70% of the nominal original thickness. Compression set on parts or specimens may differ from that on ASTM discs but values determined on production rings shall be approximately the same as those on approved samples.

4.2.6 Low Temperature Brittleness:
(After Aging in Lubricating Oil)

The specimen for rings 2 in. and less nominal ID shall be a complete ring; the specimen for rings over 2 in. nominal ID shall be a piece 3 in. long cut from a ring. The specimen shall be immersed in lubricating oil in accordance with 4.2.2 and, after cooling in air to room temperature, shall be placed in a refrigerator at -40 F $\pm$ 2 and held at that temperature for 5 hours. At the end of the refrigeration time, the specimen, while in the refrigerator or within 10 sec after removal from the refrigerator, shall withstand, without cracking, bending as follows: The complete ring shall be ovalized until the minor axis is equal to 50% of the original ID, and the 3-in. specimen shall be bent around to form a circle.