

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AMS 7274A

Issued 3-1-49

Revised 12-1-51

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 is not 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. 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. The cross-section of rings (or of specimens from rings) to be used for all fluid resistance tests shall be not over 1/8 in. and, if over, shall be reduced to 1/8 in. or less before immersion in the fluid media.

Property	Value	Test Method
4.2.1 As Received:		
Hardness, Durometer "A" or equivalent	70 + 5	ASTM D412-49T
Tensile Strength, psi, min	1500	
Elongation, %, min	150	
4.2.2 Lubricating Oil Resistance: (Immediate Deteriorated Properties)		ASTM D471-49T
Hardness Change, Durometer "A" or equivalent	-5 to +10	Medium: ASTM Oil No. 1 Temperature: 300 F + 2 Time: 96 hr
Tensile Strength Reduction, %, max (based on area before immersion)	60	
Elongation Reduction, %, max	50	
Volume Change (Method A), %	0 to +10	
Decomposition	None	
Surface Tackiness	None	

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- 4.2.2.1 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.

Property	Value	Test Method
4.2.3 <u>Processing Oil Resistance:</u> (Immediate Deteriorated Properties)		ASTM D471-49T
Hardness Change, Durometer "A" or equivalent	-20 to 0	Medium: ASTM Oil No. 3
Volume Change (Method A), %	+25 to +45	Temperature: 300 F + 2
Decomposition	None	Time: 70 hr
Surface Tackiness	None	

4.2.4 <u>Dry Heat Resistance:</u>		ASTM D573-48
Hardness Change, Durometer "A" or equivalent	0 to +10	
Tensile Strength Reduction, %, max	25	Temperature: 212 F + 2
Elongation Reduction, %, max	40	Time: 70 hr
Surface Hardening	None	
Bend (flat)	No cracks	

- 4.2.4.1 Reduction of section is not required for conditioning and testing.

4.2.5 <u>Compression Set:</u>		ASTM D395-49T, Method B
Per cent of original deflection, max	50	Temperature: 250 F + 2
		Time: 70 hr
Per cent of original thickness, max	15	Compressed to 70% original thickness

- 4.2.5.1 Reduction of section is not required for conditioning and testing.

- 4.2.5.2 Rings over 2 in. nominal ID may be cut for testing. The cut specimen shall be not less than 1 in. in length.

- 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 $-40\text{ F} + 2$ 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.

- 4.2.6.1 Should the testing schedule be such as to make it inconvenient to place the specimen in the refrigerator as soon as it has cooled to room temperature, the specimen may be allowed to rest in air until such time as it is convenient to resume the test.