

AEROSPACE MATERIAL SPECIFICATIONS

AMS 7272C

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc.

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RINGS, SEALING, SYNTHETIC RUBBER Synthetic Lubricant Resistant, NBR Type 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, primarily for static seals, where resistance to diester synthetic lubricants at temperatures up to 165 C (329 F) 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 the issue of specified ASTM methods listed in the latest issue of AMS 2350, insofar as practicable. Tensile strength testing is not required on rings which are too small to permit assembly on rollers for testing and are, after cutting, too short to permit testing as a single strand. 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 ID of the ring.
 - 4.2.1 **As Received:**

4.2.1.1	Hardness, Durometer "A" or equiv.	70 ± 5	
4.2.1.2	Tensile Strength, psi, min	1500	See 4.2.1.5
4.2.1.3	Elongation, %, min	250	See 4.2.1.5
4.2.1.4	Tensile Stress at 100% Elongation, psi, min	500	See 4.2.1.5
4.2.1.5	Use ASTM D1414 for "O" rings; use ASTM D412 for other rings.		
 - 4.2.2 **Synthetic Lubricant Resistance:**

∅ (Immediate Deteriorated Properties)		Medium:	See 4.2.2.6 ASTM Service Fluid No. 101
4.2.2.1	Tensile Strength Change, %, max	Temperature:	(ASTM D471) 150 C ± 3 (302 F ± 5.4)
		Time:	70 hr
4.2.2.2	Elongation Change, %, max		
4.2.2.3	Volume Change, %		

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4.2.2.4 Decomposition

None

4.2.2.5 Surface Tackiness

None

4.2.2.6 Procedure: Place 140 ml of test fluid in 38 mm OD x 300 mm long test tubes at room temperature. Immerse test tubes in the heating medium so that 2 in. of each tube extends above the level of the heat transfer oil in oil bath heaters or so that 1 in. of each tube extends above the top insulation of aluminum block or air well heaters. Heat the test fluid to $150\text{ C} \pm 3$ ($302\text{ F} \pm 5.4$). For rings 1 in. and under in ID, hang three rings in each tube from corrosion resistant steel wire or wires so that the top points of the rings will be 1, 2-1/2, and 4 in. below the surface of the test fluid. For rings over 1 in. but not over 3 in. ID, cut segments from each of three rings, form to 1 in. ID rings, securing the ends of the segments with corrosion resistant steel wire, and hang as for complete rings. For rings over 3 in. ID, cut 5 in. long segments from each of three rings. Hang each segment by a corrosion resistant steel wire so that the segments do not touch each other or the walls of the test tube and so that the mid-length of each segment is at the approximate mid-depth of the test fluid. Stopper the test tubes with new, bare cork stoppers 1-1/2 in. thick having two 8 mm OD glass tubes through the cork, one 3 in. long extending 1 in. below the bottom of the cork and one 5-1/2 in. long extending 3-1/2 in. above the top of the cork. Force the wire or wires from which the rings are hung into the bottom of the cork before inserting in the test tube. After the immersion period, suspend the rings in fresh test fluid at room temperature and allow to cool in this fluid for approximately 30 min., remove the rings, rinse them briefly in acetone, and blot lightly with filter paper. Determine changes in properties, using the water displacement method for measuring volume change. Record results as the average of the properties for the three specimens.

4.2.3 Aromatic Fuel Resistance:

ASTM D471

∅ (Immediate Deteriorated Properties)

Medium: ASTM Ref. Fuel B

Temperature: 20 - 30 C

(68 - 86 F)

Time: 70 hr

Prepare specimens as in 4.2.2.6

4.2.3.1 Tensile Strength Change, %, max -60
(based on area before immersion)

4.2.3.2 Elongation Change, %, max -55

4.2.3.3 Volume Change, % 0 to +35

4.2.3.4 Volume Change, %, max -10
(after 70 hr immersion in 30%
aromatic fuel followed by 48 hr
drying at $70\text{ C} \pm 1$ ($158\text{ F} \pm 1.8$)) (based
on unimmersed volume)

∅ 4.2.4 Dry Heat Resistance:

ASTM D573

Temperature: $125\text{ C} \pm 2$ (257 F \pm 3.6)

Time: 70 hr

4.2.4.1 Tensile Strength Change, %, max -25

4.2.4.2 Elongation Change, %, max -50

4.2.4.3 Bend (flat) No cracking
or checking

∅ 4.2.5 Compression Set:

ASTM D395, Method B

Temperature: $125\text{ C} \pm 2$ (257 F \pm 3.6)

Time: 70 hr

4.2.5.1 Per cent of Original Deflection, max
Ring Cross Section Diameter, Inch
0.066 to 0.110, incl 85
Over 0.110 75

See 4.2.5.3