

AERONAUTICAL MATERIAL SPECIFICATION

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

AMS3223B

Issued 12-1-42

Revised 7-1-45

SYNTHETIC RUBBER Hot Oil Resistant - High Swell (55-65)

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1. **ACKNOWLEDGMENT:** Vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. **FORM:** Sheet, strip, tubing, extrusions, molded shapes, or as ordered.
3. **APPLICATION:** The compound shall be suitable for seals.
4. **QUALITY:** (a) It shall be uniform in quality, free from foreign materials or imperfections, tough and not easily torn by hand. It shall resist the solvent and swelling actions of hot lubricating oils and coolants.
(b) Parts shall be smooth and free from flash.
(c) If products have a vulcanized joint, the joint section shall have the same strength and size as the solid section.
5. **REQUIREMENTS:** (a) Physical Properties.- This material shall possess the following physical properties as received:

Shore Durometer "A" hardness	60 $\pm$ 5
Tensile Strength, psi	1400 min
Elongation, %	300 min

All tensile tests required by this and succeeding paragraphs shall conform to ASTM D412-41, except that tensile strengths after all aging tests shall be based on the original unaged cross-sectional area.

(b) Oil Aging.- Tests shall be conducted in accordance with ASTM D471-44T, Immediate Deteriorated Properties. Test conditions shall be as follows:

Medium	Petroleum Base Lubricating Oil No. 3
	Viscosity 155 $\pm$ 5 secs. at 100°F
	Aniline Point 157°F $\pm$ 2
Temperature	300°F $\pm$ 2
Time	70 hours

After aging, the surface shall neither be tacky nor show signs of decomposition. The elongation shall have decreased by not more than 75% from the value found for the material as received. The volume change shall be within the limits of +50 to +150%.

(c) Oil Aging.- Tests shall be conducted in accordance with ASTM D471-44T, Immediate Deteriorated Properties. Test conditions shall be as follows:

Medium	Petroleum Base Lubricating Oil No. 1 (Aircraft Engine Lubricating Oil) Viscosity 98 ± 5 secs. at 210°F Viscosity Index 95 min Aniline Point $253^{\circ}\text{F} \pm 2$
Temperature	$300^{\circ}\text{F} \pm 2$
Time	70 hours

After aging, the surface shall neither be tacky nor show signs of decomposition. The Shore Durometer "A" hardness shall be within the limits of -15 to +10 points. The tensile strength shall have decreased by not more than 60% and the elongation by not more than 60% from the values found for the material as received. The volume change shall be within the limits of +15 to +40%.

(d) Oven Aging.- Tests shall be conducted in accordance with ASTM D573-42 for 70 hours at $212^{\circ}\text{F} \pm 2$. After aging, the surface shall be neither hard nor brittle, and the specimens shall withstand bending 180° flat. The Shore Durometer "A" hardness change shall be within the limits of 0 to +10 points. The tensile strength shall have decreased by not more than 25% and the elongation by not more than 40% from the values found for the material as received.

(e) Compression Set.- Tests shall be conducted in accordance with ASTM D395-40T, Method B, under the following conditions:

Time	70 hours
Temperature	$250^{\circ}\text{F} \pm 2$
Compression, To	70% of original thickness

- (1) The maximum compression set shall be 50% when expressed as a percentage of the original deflection.
- (2) The maximum compression set shall be 15% when expressed as a percentage of the original thickness.

(f) Low Temperature Brittleness.- Tests of the material after aging in Petroleum Base Lubricating Oil No. 1 as in paragraph (c), and of the material as received, shall be conducted in accordance with ASTM D736-43T for 5 hours at -40°F . The compound shall pass the brittleness test.

6. **SAMPLING:** (a) Sampling procedures shall conform to ASTM D15-41. The vendor shall furnish sufficient material for such specimens from production run materials which he guarantees to be of equal quality to the material supplied, except where the purchaser desires specimens from production run parts, in which case the procedure in paragraph (b) shall be followed.