AERONAUTICAL MATERIAL SPECIFICATION

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

AMS 3222B

Issued 12-1-42
Revised 7-1-45

SYNTHETIC RUBBER
Hot Oil Resistant - High Swell (45-55)

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 which may be in contact with hot oil.

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.

(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	50 ± 5
Tensile Strength, psi	1500 min
Elongation, %	400 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. 1 (Aircraft Engine Lubricating Oil) Viscosity 98 ± 5 secs. at 210°F Viscosity Index 95 min. Aniline Point 253°F ± 2
Temperature	300°F ± 2
Time	24 and 70 hours

After the 24 hour aging period, the surface shall neither be tacky nor show signs of decomposition. The Shore Durometer "A" hardness change shall be within the limits of -5 to +5 points. The tensile strength shall have decreased by not more than 50% and the elongation by not more than 50% from the values found for the material as received. The volume change shall be within the limits of +15 to +30%. Samples aged for 70 hours shall show a Shore Durometer "A" hardness change of -10 to +10 points. The surface shall neither be tacky nor show signs of decomposition. Samples shall withstand bending 180° flat without cracking. The volume change shall be within the limits of +15 to +40%.

5. REQUIREMENTS: (cont'd)

(c) Oven Aging.- Tests shall be conducted in accordance with ASTM D573-42 for 70 hours at 212° ± 2°F. After aging, the surface shall be neither hard nor brittle, and specimens shall withstand bending 180° flat without cracking. 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 40% and the elongation by not more than 50% from the values found for the material as received.

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

Time	70 hours
Temperature	212° ± 2°F
Compression, to	70% of original thickness

(1) The maximum compression set shall be 85% when expressed as a percentage of the original deflection.

(2) The maximum compression set shall be 26% when expressed as a percentage of the original thickness.

Note: In lieu of the compression set above, the tension set may be determined in accordance with ASTM D412-41. The permanent set shall not exceed 10%.

(e) Low-Temperature Brittleness.- Tests of the material after aging in Petroleum Base Lubricating Oil No. 1 as in paragraph (b), 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. 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 purchaser desires specimens from production run parts, in which case the procedure in paragraph (b) shall be followed.

(b) When the form in which the material is furnished is unsuitable for the proper preparation of the required test specimens, the size of the test specimens shall be modified for adaptation to the finished part. This modification of the sampling procedure shall be agreed upon by both vendor and purchaser. If the requirements of the specification cannot be met using the modified test specimens, the modified test requirements shall be agreed upon by both vendor and purchaser.

7. TOLERANCES: Unless otherwise specified on the drawing or purchase order, the following tolerances apply; all dimensions are in inches:

(a) Sheet and Strip.-

Nominal Thickness	Tolerance Plus and Minus
1/8 and less	1/64
Over 1/8 to 1/2, incl.	1/32
Over 1/2	3/64