AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 3223B

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

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 ± 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 ± 5 secs. at 100°F Aniline Point 157°F ± 2
Temperature	300°F ± 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°F ± 2
Temperature	300°F ± 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°F ± 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°F ± 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.

6. SAMPLING: (continued)

(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 the 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 the vendor and the 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

(b) Tubing and Molded Hose.-

Nominal Wall Thickness	Tolerance Plus and Minus
Less than 1/16	0.005
1/16 and over	10%

(c) Extrusions and Molded Parts.- Sections may be as much as plus and minus 0.005 inch outside of drawing limits provided the cross-sectional area is within the limits given by the drawing dimensions.

8. REPORTS: Unless otherwise specified, the vendor shall furnish three copies of a notarized report of the results of tests to determine conformance to this specification. This report shall include the purchase order number, material specification number, vendor's compound number, percentages and specific type of synthetic or synthetics used, part number and quantity.

9. IDENTIFICATION: Unless otherwise agreed between the purchaser and the vendor, all material shall be identified and marked in accordance with the latest revision of AMS 2810.

10. PACKAGING: Packaging shall be accomplished in such a manner as to insure that the materials being shipped will not be permanently distorted or compressed, or be exposed to undue weathering, or harmful materials of any kind.