SAE The Engineering Society For Advancing Mobility Land Sea Air and Space

400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 3685A

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Superseding AMS 3685

ADHESIVE, SYNTHETIC RUBBER
Buna N Type

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of April 15, 1986. It is recommended that this specification not be specified for new designs.

This cover sheet should be attached to the "A" revision of the subject specification.

Noncurrent refers to those materials which have previously been widely used and which may be required on some existing designs in the future. The Aerospace Materials Division does not recommend these as standard materials for future use in new designs. Each of these "Noncurrent" specifications is available on request.

This specification is under the jurisdiction of AMS Committee "CE".

AERONAUTICAL MATERIAL SPECIFICATION

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

AMS 3685A

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ADHESIVE, SYNTHETIC RUBBER
Buna N Type

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

2. APPLICATION: Primarily for effecting elastic bonds between fabric or ø synthetic rubber and plastics or metal. Bonds have good resistance to lubricating oil but only fair resistance to aromatic fuels.

3. MATERIAL: Shall consist of Buna N synthetic rubber base stock dispersed or ø dissolved in suitable solvents to form a homogeneous product, ready for use without additions other than solvents for thinning.

4. TECHNICAL REQUIREMENTS:

4.1 General:

4.1.1 Brushing Characteristics: Adhesive shall be suitable for application by ø brushing after addition of not more than 7.5% by volume of suitable solvent.

4.1.2 Weathering: When specified, the adhesive shall have weather resistance acceptable to the purchaser as determined by a procedure agreed upon by purchaser and vendor.

4.1.3 Corrosion: The adhesive shall not have a corrosive effect on other materials with which it is normally used.

4.1.4 Skinning: Shall be absent in a one-quarter filled closed container after 48 hours.

4.1.5 Package Stability: Adhesive shall not be deleteriously affected by storage for six months at room temperature in unopened containers.

4.1.6 Toxicity: Application of the adhesive under normal shop conditions shall ø not create a health hazard.

4.2 Properties: Adhesive, thinned as in 4.1.1 if necessary, shall conform to ø the following requirements; tests shall be performed in accordance with ASTM D816-46T except as noted for individual requirements.

4.2.1 Adhesion Strength in Tension: Shall be not lower than 125 psi, reported as the average of 5 determinations. Test specimen materials shall be ø AMS 4120 aluminum alloy and AMS 3208 synthetic rubber; rubber buttons shall be 0.062 in. ± 0.005 thick. Aluminum alloy cylinders shall be sanded to a fresh surface before each use, using No. 120 grit, and shall be given a final cleaning with carbon tetrachloride. Rubber buttons shall be cut to size, buffed on a powered wire wheel to roughen 100% of the bond area and cleaned with carbon tetrachloride. Apply one coat of adhesive to each surface to be bonded, allow to air dry for approximately 15 min., place parts together and apply pressure of 150-200 psi for 1 min., remove load and allow joints to condition for 48 hr at room temperature with no pressure, before testing.

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4.2.2 Adhesion Strength in Shear, Aluminum to Synthetic Rubber: Shall be not lower than 75 psi, reported as the average of 5 determinations. Type 2 (sandwich) ø specimens shall be used. Test specimen materials shall be AMS 4041 clad aluminum alloy, 0.064 in. thick, and AMS 3208 synthetic rubber. Aluminum alloy strips shall not have roughened surfaces, but shall be cleaned with carbon tetrachloride. Rubber blocks shall be cut to size, buffed on a powered wire wheel to roughen 100% of the bond area and cleaned with carbon tetrachloride. Apply one coat of adhesive to each surface to be bonded, allow to air dry for approximately 15 min., place parts together and apply pressure of 150-200 psi for 1 min., remove load and allow joints to condition for 48 hr at room temperature with no pressure, before testing.

4.2.3 Adhesion Strength in Shear, Aluminum to Cotton Webbing: Shall be not lower than 150 psi, reported as the average of 5 determinations. Type 1 (lap) ø specimens shall be used. Test specimen materials shall be AMS 4041 clad aluminum alloy, 0.064 in. thick, and MIL-W-5665, Type II cotton webbing. Aluminum alloy strips shall not have roughened surfaces, but shall be cleaned with carbon tetrachloride. Webbing shall be free from dirt, grease and oil in the area to be bonded but shall not be cleaned. Apply one or more coats of adhesive to the webbing as necessary to impregnate the webbing thoroughly, allowing each coat to air dry for 15-30 min. before applying the next coat. Apply one coat of adhesive to the aluminum and a final coat to the webbing, allow to dry for approximately 15 min., place parts together and apply pressure of 250-450 psi for 1 min., remove load and allow joints to condition for 48 hr at room temperature with no pressure, before testing.

4.2.4 Adhesion Strength, Stripping Method: Shall be not lower than 3 lb, reported as the average of 5 determinations. Use the same materials for test specimens and prepare in the same manner as in 4.2.3.

4.2.5 Bonding Range: The open drying time required to produce a bond strength not lower than 30 psi shall be not over 20 min., reported as the average of 5 determinations. Type 2 (sandwich) specimens shall be used. Test specimen materials, preparation of these materials, and preparation of specimens shall be the same as in 4.2.2, except that the application of adhesive shall be so scheduled that specimens may be dried for various intervals before bonding under pressure and tested 3 min. after making the bond.

4.2.6 Aromatic Fuel Resistance: The average adhesion strength in shear of aluminum-to-cotton-webbing specimens after immersion for 24 hr in ASTM Reference Fuel ø No. 2 at 70-85 F shall be not less than 40% of the average found for similar specimens not immersed in fuel. Test specimen materials, preparation of these materials, and preparation of specimens shall be the same as in 4.2.3. Specimens shall be immersed in fuel after the 48-hr conditioning period and shall be tested immediately after removal from the fuel.

4.2.7 Water Resistance: The average adhesion strength in shear of aluminum-to-cotton-webbing specimens after immersion for 48 hr in distilled water at 205-212 F ø shall be not less than 50% of the average found for similar specimens not immersed in water. Test specimen materials, preparation of these materials, and preparation of specimens shall be the same as in 4.2.3. Specimens shall be immersed in water after the 48-hr conditioning period and shall be tested immediately after removal from the water.