AEROSPACE
MATERIAL SPECIFICATIONS
SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

AMS 2516

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Revised

POLYTETRAFLUOROETHYLENE RESIN COATING
High Build, 700 - 750 F (370 - 400 C) Fusion

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

2. APPLICATION: Primarily as a coating on metal parts to produce a fused polytetrafluoroethylene resin surface providing dry lubrication, high heat stability, and optimum corrosion protection. Applicable primarily to parts which operate at temperatures not higher than 525 F (275 C) for limited periods or 475 F (245 C) for extended periods. The preheating temperature for steels and the fusing temperature may result in some softening of metals which have been cold worked or have been given final heat treatment at temperatures lower than these temperatures. This coating is usually smoother than that of AMS 2515.

3. MATERIAL: The coating material shall be a dispersion of polytetrafluoroethylene resin solids with a small amount of a coalescing resin in a water medium and shall be unpigmented unless colored material is specified.

3.1 When multiple coatings are applied as in 4.3 and 4.4 to meet specified total dry film thickness, each coat shall be free from cracks after fusing at 700 - 750 F (371.1 - 398.9 C) when examined under 40x magnification.

4. PROCEDURE:

4.1 Surface Preparation: Surfaces to be coated shall be degreased and then shall be chemically cleaned or lightly abrasive blasted, cleaned to remove abrasive particles, and air dried.

4.2 Preheating: Immediately prior to coating, metals other than aluminum, magnesium, and copper shall be preheated to 750 F ± 10 (398.9 C ± 5.6) to produce a light oxide film and remove any organic contamination and then air cooled.

4.3 Coating:

4.3.1 Primer: A primer resin coat of 0.2 - 0.4 mil dry film thickness shall be applied to the oxidized metal surfaces and fused in accordance with 4.4.

4.3.2 Finish: The finish resin coating material shall be applied to the primed surfaces as required to yield the specified total dry film thickness; thickness of each coat shall be 2 - 3 mils for the first few coats but should gradually be decreased to approximately 1 mil as total coating thickness increases toward 40 mils. Each coat shall be fused before application of the succeeding coat. For best corrosion properties, coated surfaces shall be sanded and cleaned between coats.

4.3.3 The coating thickness shall be as specified on the drawing.

4.4 Fusing: The resin coating shall be air dried to a dry, non-glossy appearance or forced-heat dried at 180 - 200 F (82.2 - 93.3 C) for 5 - 10 minutes. The dried coating shall be fused at 700 - 750 F (371.1 - 398.9 C) until fusing is complete. Fusing is complete when the milk-white (for unpigmented material) air-dried film changes to a clear fused film. Fusing time will vary depending on the mass of metal being coated. For maximum coating toughness, the fused coating shall be quenched in cold water after the final fusing cycle. Adequate ventilation shall be provided in furnace areas to prevent inhalation of toxic fumes.

4.5 Repair of Damaged Areas: Damaged areas shall be sanded to a feather edge. If basis metal is exposed, a new primer application shall be used. As many coats as required to build the film to its original thickness shall be applied, observing the coating thickness requirements of 4.3.2. Care shall be taken to remove any overspray of primer from the original top coat and to apply the resin coating well beyond the perimeter of the damaged area. After air drying, repaired areas shall be fused by means of an open flame. In fusing, heating to a temperature above that at which the coating changes to a clear fused film shall be avoided; bright glowing spots in the film are evidence of overheating and decomposition of the resin. Flame fusing shall be performed only under a hood or forced draft ventilation.

5. TECHNICAL REQUIREMENTS:

5.1 Adhesion: A representative coated 0.250 in. diameter rod, processed with each lot of parts, shall show no evidence of chalking, blistering, or loss of adhesion of coating when cycled in accordance with the latest issue of MIL-STD-202, Method 102, Condition C, except that the cycling temperature range shall be -80 F (-62.2 C) to +500 F (260 C).

5.2 Coefficient of Friction: The coating shall have a coefficient of friction not higher than 0.1 when tested with a Timken Tester at a temperature of 77 F (25 C), a speed of 25 fpm, and a load of 10 pounds.

5.3 Corrosion Resistance: A representative part or test panel processed to a dry film thickness of 3.0 - 4.0 mils shall withstand 168 hr exposure to salt spray without evidence of deterioration of the coating or corrosion of the basis metal; salt spray test shall be conducted in accordance with the issue of ASTM B117 listed in the latest issue of AMS 2350.

5.4 Water Vapor Resistance: A panel of low carbon steel, AMS 5040 or equivalent, processed to a dry film thickness of 4.5 - 6.0 mils shall show no blisters in the film and no incipient rusting of the basis metal when exposed to boiling water vapor for 96 hours.

5.4.1 The specimen shall be placed horizontally, with coated side down, across the top of a 400 ml beaker maintained approximately half full of gently boiling water. Note: By starting with the beaker somewhat more than half full, properly regulating the boiling rate, and allowing the water to drop somewhat below the half full point, the test can run unattended for approximately 8 hours.

6. QUALITY: The coating shall be smooth, uniform, and free from craters, pin holes, sags, runs, bubbles, heavy edges, foreign materials, and other imperfections detrimental to performance of parts.