Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 2450D
Superseding AMS 2450C

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SPRAYED METAL FINISH
Aluminum

1. SCOPE:

1.1 Purpose: This specification covers the procedure to be used for aluminum spraying metallic parts and the properties of the finish.

1.2 Application: Primarily to provide thermal radiation and protection against corrosion of air-cooled cylinder assemblies and for building up surfaces of other parts where applicable.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, Pennsylvania 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods
AMS 4180 - Aluminum Wire, 99.0 Min Al (1100-H18)

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

ASTM B117 - Salt Spray (Fog) Testing
ASTM E11 - Wire-Cloth Sieves for Testing Purposes

3. TECHNICAL REQUIREMENTS:

3.1 Equipment:

3.1.1 Metal Spray Gun: The metal spray gun shall be provided with two-stage oxygen and acetylene ø regulators capable of maintaining uniform delivery pressures at any desired setting in the pressure range of 5 to 50 psi (34.5 to 345 kPa), and shall be equipped with accurate indicating pressure gages.

3.1.2 Air Cleaner: An oil or water extractor shall be used in the air line to the metal spray gun in order ø to assure clean, dry air.

3.2 Preparation:

3.2.1 Completely remove all oil and grease by vapor degreasing or by other methods of equal cleaning power.

3.2.2 Blast with No. 18 (0.039 in.) (0.99 mm), No. 20 (0.033 in.) (0.84 mm), or No. 25 (0.028 in.) (0.71 mm) refractory grit, or with No. 30 (0.023 in.) (0.58 mm), No. 35 (0.020 in.) (0.51 mm), or No. 40 (0.017 in.) (0.43 mm) hard, angular, silica or flint sand, free from oil, grease, dust, moisture, and other foreign substances. The above designations are standard sieve numbers and sieve openings in inches (millimetres) in accordance with ASTM E11.

3.2.3 No. 35 (0.020 in.) (0.51 mm) steel grit may be used for blasting steel but shall not be used on aluminum alloy.

3.2.4 If compressed air is used as the blasting force, it shall be essentially free from oil and water.

3.2.5 Extreme care shall be exercised that products of corrosion and foreign materials are thoroughly removed by the blasting and the surfaces roughened to attain a good bond for the sprayed aluminum. Remove all dust and particles after blasting by blowing with high-pressure, clean, dry air.

3.2.6 Blasted surfaces shall be kept clean and handled only with protected hands until spraying operations can proceed.

3.3 Procedure:

3.3.1 Sprayed metal coating shall be applied as soon as possible after the surfaces have been blasted.

3.3.2 The aluminum shall be applied with an approved metal spray gun in such a manner as to insure complete coverage of the entire surface without depositing an unnecessarily heavy coating.

3.3.3 All surfaces exposed after the parts are assembled shall be sprayed, unless otherwise noted, with metallic aluminum conforming to AMS 4180.

3.4 Properties:

3.4.1 Thickness: The thickness of the sprayed metal coating shall be as specified on the drawing. When not Ø so specified, the thickness shall be 0.004 - 0.010 in. (0.10 - 0.25 mm).

3.4.2 Corrosion Resistance:

3.4.2.1 The effectiveness of the sprayed metal coating shall be determined by periodically subjecting representative parts to the salt spray corrosion test conducted in accordance with ASTM B117.

3.4.2.2 If the metallized steel parts selected for test are oily or greasy, they shall be degreased with trichlorethylene vapor or other suitable volatile solvent. Exposed, unsprayed surfaces of the steel shall be protected with a suitable coating to prevent corrosion. The prepared parts shall be exposed in such a position as to prevent or minimize accumulation of condensate in recesses and shall be spaced to allow free circulation of the fog within the spray chamber.

3.4.2.3 The exposed parts shall be visually examined daily during the duration of the test. They shall be carefully removed from the spray chamber, thoroughly washed in running tap water, scrubbing only with a bristle brush if necessary to completely remove persistent salt encrustation, and inspected closely for evidence of rust. If rusted areas appear on the metallized portion of the parts at any time during the test and remain at the finish, it is proof that the sprayed coating has failed to afford full protection for the basis metal. Slight discoloration, which shows little or no tendency to spread or deepen as the test progresses to completion is permissible.

3.4.2.4 Finned areas of steel cylinder barrels, and areas of other parts having deep fins, grooves, or recesses where it is impracticable to apply full thickness of metal coating to the bottoms without depositing an excessively heavy coating on the outer edges, shall withstand not less than 250 hr continuous exposure to the salt spray without rusting.

3.4.2.5 Other steel areas where the surfaces are readily accessible and permit controlled application of the metal coating shall withstand not less than 500 hr continuous exposure to the salt spray without rusting.

3.5 Quality: Sprayed coating shall be of fine texture, close grained, as dense as possible, and free from unatomized particles of metal.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of coated parts shall supply all samples and shall be responsible Ø for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.5. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to assure that the coating conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to thickness (3.4.1) and visual appearance (3.5) Ø requirements are classified as acceptance or routine control tests.

4.2.2 Qualification Tests: Tests to determine conformance to corrosion resistance (3.4.2) requirements Ø are classified as qualification or periodic control tests.

4.3 Sampling: Shall be not less than the following; a lot shall be all parts of the same part number sprayed in Ø a continuous operation and presented for inspection at one time.

Ø4.3.1 Thickness and Visual Examination: Three parts per lot.

Ø4.3.2 Corrosion Resistance: As agreed upon by purchaser and vendor.

4.4 Approval:

4.4.1 Parts coated in accordance with this specification shall be approved by purchaser before parts for production use are supplied, unless such approval be waived.

4.4.2 Vendor shall use materials, manufacturing procedures, processes, and methods of inspection on produc- Ø tion parts which are essentially the same as those used on the approved sample parts. If any change is necessary in processing parameters the vendor shall submit for reapproval of the process a detailed statement of the revised operations and, when requested, sample coated parts. No production parts coated by the revised procedure shall be shipped prior to receipt of reapproval.

4.5 Reports: The vendor of coated parts shall furnish with each shipment three copies of a report showing the Ø purchase order number, part and coating material specification numbers and their revision letters if any, contractor or other direct supplier of part and coating materials, part number, and quantity. When the coating material is produced or purchased by the coated parts vendor, that vendor shall inspect each lot of material to determine conformance to the applicable material specification, and shall include in the report a statement that the materials conform, or shall include copies of laboratory reports showing the results of tests to determine conformance. This report shall also include the results of tests to determine that the coating conforms to the requirements of this specification.