SAE Aerospace
An SAE International Group

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 2451/12

Issued 2002-12
Reaffirmed 2011-04

Plating, Brush, Tin

1. SCOPE:

1.1 Purpose:

This specification covers the engineering requirements and process for brush plating of tin by electrodeposition. It shall be used, in conjunction with AMS 2451, for general-purpose tin deposits.

1.2 Application:

This process has been used typically to prevent galling or seizing of metal surfaces, to provide a surface for soft soldering, or to improve corrosion resistance, but usage is not limited to such applications.

1.3 Safety - Hazardous Materials:

See AMS 2451.

2. APPLICABLE DOCUMENTS:

See AMS 2451.

3. TECHNICAL REQUIREMENTS:

The requirements of AMS 2451 shall apply as herein amended.

3.1 Procedure:

3.1.1 Except as required in 3.1.1.1 or 3.1.2, tin shall be electroplated directly on the basis metal from a suitable brush plating solution in accordance with processing instructions from the solution manufacturer.

3.1.1.1 For aluminum and aluminum alloys, a zinc immersion preplate may be used.

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: http://www.sae.org

3.1.2 Prior to electrodeposition of tin for solderability on aluminum or copper-zinc alloy parts, a copper plate shall be deposited to a thickness of 0.0002 to 0.0003 inch (5.1 to 7.6 µm).

3.2 Properties:

3.2.1 Thickness: Where “tin flash” is specified, plate thickness shall be approximately 0.0001 inch (2.5 µm).

3.3 Solderability:

When specified, solderability of the plating shall be in accordance with ASTM B 545. The method of test shall be as specified by purchaser.

3.4 Continuity of Plating:

When specified, plating on ferrous parts, having a plating thickness of 0.0004 inch (10 µm) or more, shall be subjected to the porosity test of ASTM B 545 and the result evaluated according to the procedure described. When specified, plating on copper and copper alloys shall be subjected to the porosity test for copper basis metal given in ASTM B 545: the specimens shall be considered to have failed if pores in the coating blacken by the polysulfide test.

4. QUALITY ASSURANCE PROVISIONS:

See AMS 2451.

5. PREPARATION FOR DELIVERY:

See AMS 2451.

6. ACKNOWLEDGEMENT:

See AMS 2451.

7. REJECTIONS:

See AMS 2451.

8. NOTES:

The requirements of AMS 2451 shall apply as herein amended.

8.1 When using tin plating for electronics and precision moving parts applications, the potential for formation of tin whiskers should be considered. Under certain circumstances, metal whiskers grow from surfaces of tin electrodeposits. The tin whiskers are electrically conductive and some have measured 40 to 80 millionths of an inch in diameter with lengths up to 0.375 inch. Whiskers can reduce the electrical resistance between surfaces or cause short circuits. In the case of precision moving parts, displaced whiskers can cause mechanical interference.