

Finish Specification

100-337-00

Owner – Joe Otto

Approvals:

| Department | Approved. | Date |
|-------------------|------------------|-------------|
| Engineering | Scott Timms | 8/21/14 |
| Manufacturing | Scott Emond | 8/21/14 |
| Quality | Drew Ware | 8/21/14 |
| Material Control | Mindy Anderson | 8/21/14 |
| Purchasing | Scott Emond | 8/21/14 |

Change History

| Rev | Description | By | Date |
|-----|--|-----|----------|
| - | Initial Release | DHR | 10/02/81 |
| A | ECO #1732 | JCO | 01/14/91 |
| B | Added -08 | JCO | 07/02/93 |
| C | Added -09 | JCO | 07/20/93 |
| D | Redrawn and Revised | JCO | 09/20/97 |
| E | Redrawn and Revised | JCO | 01/12/98 |
| F | Redrawn and Revised | JCO | 07/15/98 |
| G | ECO 1965 | JCO | 09/25/98 |
| H | ECO 2277 | JCO | 01/26/05 |
| I | Paragraph 3.12.1 was: Electroless nickel plate per SAE-AMS-C-26074, 0.0002" minimum thickness. | JCO | 08/16/06 |
| J | See ECN | JCO | 09/07/07 |
| K | See redline document | JCO | 02/13/08 |
| L | Added -14. See redline document. | JCO | 01/21/09 |
| M | Added -15. See outline document. | JCO | 08/03/09 |
| N | See redline document. | JCO | 01/14/11 |
| P | Converted from drawing to process See redline document. | JCO | 06/27/12 |
| Q | Paragraphs 3.15.1 and 3.15.2, step 3: 0.001" was 0.0001" | JCO | 06/23/14 |
| R | Added paragraph 3.16 | JCO | 8/20/14 |

1. Scope

This document details the plating specifications used by Captor Corporation.

2. Reference Documents

The following specifications and standards form a part of this specification to the extent specified herein.

Specifications, Military

MIL-DTL-5541 Chemical Conversion Coatings on Aluminum and Aluminum Alloys.

Standards, Military

MIL-STD-202 Test Methods for electronic and electrical component parts.

Standards, ASTM

ASTM B 339 Tin, Pig, Grade A

ASTM B 545 Standard Specification for Electrodeposited Coating of Tin

ASTM B 579 Standard Specification for Electrodeposited coatings of Tin-Lead Alloy Solder Paste

ASTM B700 Standard Specification for Electrodeposited Coatings of Silver for Engineering use

Standards, SAE

AMS-QQ-290 Nickel Plating (Electrodeposited)

AMS 2404 Plating, Electroless Nickel

AMS 2405 Electroless Nickel Plating, Low Phosphorus

AMS 2418 Plating, Copper

AMS-C-26074 Coatings, Electroless Nickel, Requirements For

AMS-P-81728 Plating, Tin-Lead (Electrodeposited)

3. General Requirements

Table 1 provides a listing of the standard plating used by Captor Corporation.

3.1. 100-337-01 CHEMICAL CONVERSION COATING: Aluminum.

1. Chemical conversion coating per MIL-DTL-5541, class 3, Type 1 (Color yellow/gold).

3.2. 100-337-02, ELECTRO TIN REFLOWED (Threaded and Bulk parts): Brass, Copper, Steel.

1. Copper flash per AMS 2418, 0.000020" minimum thickness.
2. Electro tin plate per ASTM B 545, except must contain 3% lead minimum, 0.0001" to 0.0003" thickness.
3. Reflow (fuse) electro tin plating.
4. Solderability to be per paragraph 4.2 herein.
5. Parts must meet thread class requirements and dimensional requirements after plating.

3.3. 100-337-03, HOT TIN DIP: Brass, Copper, Steel.

1. Hot tin dip per ASTM B 339, except must contain 3% lead minimum, 0.0003" minimum thickness.
2. Solderability to be per paragraph 4.2 herein.

3.4. 100-337-04, ELECTRO TIN (Threaded parts): Brass, Copper, Steel.

1. Copper flash per AMS 2418, 0.000020" minimum thickness.
2. Electro tin plate per ASTM B 545, except must contain 3% lead minimum, 0.0001" to 0.0003" thickness.
3. Solderability to be per paragraph 4.2 herein.
4. Parts must meet thread class requirements and dimensional requirements after plating.

3.5. 100-337-05, ELECTRO TIN: Stainless Steel.

1. Nickel strike per AMS-QQ-N-290, 0.000020" minimum thickness.
2. Copper plate per AMS 2418, 0.0001" minimum thickness.
3. Electro tin plate per ASTM B 545, except must contain 3% lead minimum, 0.0003" minimum thickness.
4. Solderability to be per paragraph 4.2 herein.

3.6. 100-337-06, ELECTRO TIN: Brass, Copper, Steel.**3.6.1. 100-337-06I, ELECTRO TIN: Brass, Copper, Steel.**

1. Copper plate per AMS 2418, 0.0001" minimum thickness.
2. Electro tin plate per ASTM B 545, except must contain 3% lead minimum, 0.0003" minimum thickness.
3. Solderability to be per paragraph 4.2 herein.

3.6.2. 100-337-06II, ELECTRO TIN REFLOWED: Brass, Copper, Steel.

1. Copper plate per AMS 2418, 0.0001" minimum thickness.
2. Electro tin plate per ASTM B 545, except must contain 3% lead minimum, 0.0001" to 0.0003" thickness.
3. Reflow (fuse) electro tin plating.
4. Solderability to be per paragraph 4.2 herein.

3.7. 100-337-07, ELECTRO TIN: Aluminum.

1. Electroless nickel flash per AMS-C-26074 (AMS 2404/AMS 2405), 0.0001" nominal thickness.
2. Copper plate per AMS 2418, 0.0001" minimum thickness.
3. Electro tin plate per ASTM B 545, except must contain 3% lead minimum, 0.0003" minimum thickness.
4. Solderability to be per paragraph 4.2 herein.

3.8. 100-337-08, ELECTRO TIN-LEAD: Brass, Copper, Steel.**3.8.1. 100-337-08I, ELECTRO TIN-LEAD: Brass, Copper, Steel.**

1. Copper plate per AMS 2418, 0.0001" minimum thickness.
2. Electro tin-lead plate per AMS-P-81728, 0.0001" to 0.0003" thickness.
3. Solderability to be per paragraph 4.2 herein.
4. If 100-337-08I is specified, the finish shall contain 10% lead.
5. If 100-337-08I(30) is specified, the finish must meet the AMS-P-81728, Table 1 Coating Composition (29% to 50% lead).

3.8.2. 100-337-08II, ELECTRO TIN-LEAD REFLOWED: Brass, Copper, Steel.

1. Copper plate per AMS 2418, 0.0001" minimum thickness.
2. Electro tin-lead plate per AMS-P-81728, 0.0001" to 0.0003" thickness.
3. Reflow (fuse) electro tin-lead plating.
4. Solderability to be per paragraph 4.2 herein.
5. If 100-337-08II is specified, the finish shall contain 10% lead.
6. If 100-337-08II(30) is specified, the finish must meet the AMS-P-81728, Table 1 Coating Composition (29% to 50% lead).

3.9. 100-337-09, ELECTRO TIN-LEAD: Aluminum.**3.9.1. 100-337-09I, ELECTRO TIN-LEAD: Aluminum.**

1. Electroless nickel flash per AMS-C-26074 (AMS 2404/AMS 2405), 0.0001" nominal thickness.
2. Copper plate per AMS 2418, 0.0001" minimum thickness.
3. Electro tin-lead plate per AMS-P-81728, 0.0001" to 0.0003" thickness.
4. Solderability to be per paragraph 4.2 herein.
5. If 100-337-09I is specified, the finish shall contain 10% lead.

6. If 100-337-09I(30) is specified, the finish must meet the AMS-P-81728, Table 1 Coating Composition (29% to 50% lead).

3.9.2. 100-337-09II, ELECTRO TIN-LEAD REFLOWED: Aluminum.

1. Electroless nickel flash per AMS-C-26074 (AMS 2404/AMS 2405), 0.0001" nominal thickness.
2. Copper plate per AMS 2418, 0.0001" minimum thickness.
3. Electro tin-lead plate per AMS-P-81728, 0.0001" to 0.0003" thickness.
4. Reflow (fuse) electro tin-lead plating.
5. Solderability to be per paragraph 4.2 herein.
6. If 100-337-09II is specified, the finish shall contain 10% lead.
7. If 100-337-09II(30) is specified, the finish must meet the AMS-P-81728, Table 1 Coating Composition (29% to 50% lead).

3.9.3. 100-337-09IIA, ELECTRO TIN-LEAD REFLOWED: Aluminum.

1. Electroless nickel flash per AMS-C-26074 (AMS 2404/AMS 2405), class 4, 0.0001" nominal thickness.
2. Copper plate per AMS 2418, 0.0001" minimum thickness.
3. Electro tin-lead plate per AMS-P-81728, 0.0001" to 0.0003" thickness.
4. Reflow (fuse) electro tin-lead plating.
5. Solderability to be per paragraph 4.2 herein.
6. If 100-337-09II is specified, the finish shall contain 10% lead.
7. If 100-337-09II(30) is specified, the finish must meet the AMS-P-81728, Table 1 Coating Composition (29% to 50% lead).

3.10. 100-337-10, SEE DETAILED DRAWING.

This procedure is for special plating requirements, refer to the specified detail drawing.

3.11. 100-337-11 (REMOVED).

3.12. 100-337-12, ELECTROLESS NICKEL, LOW PHOSPHORUS: Aluminum, Brass, Steel.

1. Electroless nickel plate per AMS-C-26074 (AMS 2404/AMS2405), 0.0002" to 0.0004" thickness.
2. Must contain less than 4% phosphorous by weight.
3. Solderability to be per paragraph 4.2 herein.

3.13. 100-337-13, ELECTRO TIN-LEAD: Stainless Steel.

3.13.1. 100-337-13I, ELECTRO TIN-LEAD: Stainless Steel.

1. Nickel strike per AMS-QQ-290, 0.000020" minimum thickness.
2. Copper plate per AMS 2418, 0.0001" minimum thickness.
3. Electro tin-lead plate per AMS-P-81728, 0.0001" to 0.0003" thickness.
4. Solderability to be per paragraph 4.2 herein.
5. If 100-337-13I is specified, the finish shall contain 10% lead.
6. If 100-337-13I(30) is specified, the finish must meet the AMS-P-81728, Table 1 Coating Composition (29% to 50% lead).

3.13.2. 100-337-13II, ELECTRO TIN-LEAD REFLOWED: Stainless Steel.

1. Nickel strike per AMS-QQ-290, 0.000050" nominal thickness.
2. Copper plate per AMS 2418, 0.0001" minimum thickness.
3. Electro tin-lead plate per AMS-P-81728, 0.0001" to 0.0003" thickness.
4. Reflow (fuse) electro tin-lead plating.
5. Solderability to be per paragraph 4.2 herein.
6. If 100-337-13II is specified, the finish shall contain 10% lead.
7. If 100-337-13II(30) is specified, the finish must meet the AMS-P-81728, Table 1 Coating Composition (29% to 50% lead).

3.14. 100-337-14, ELECTRODEPOSITED SILVER: Aluminum.

1. Electroless nickel strike per AMS-C-26074 (AMS 2404/AMS 2405), 0.0001 to 0.0003" thickness.
2. Silver plate per ASTM B700, Type III, Grade D, Class S, 0.0001 to 0.0003" thickness.
3. Solderability to be per paragraph 4.2 herein.

3.15. 100-337-15, ELECTRO TIN-LEAD (SOLDER): Aluminum.**3.15.1. 100-337-15I, ELECTRO TIN-LEAD, MATTE (SOLDER): Aluminum.**

1. Zincate and copper strike per ASTM B253.
2. Copper plate per AMS 2418, 0.0001" minimum thickness.
3. Electroless nickel plate per AMS 2404 Class 4, 0.001" minimum thickness.
4. Electro tin-lead plate per ASTM B579, 0.0001" to 0.0003" thickness.
5. Solderability to be per paragraph 4.2 herein.

3.15.2. 100-337-15II, ELECTRO TIN-LEAD REFLOWED (SOLDER): Aluminum.

1. Zincate and copper strike per ASTM B253.
2. Copper plate per AMS 2418, 0.0001" minimum thickness.
3. Electroless nickel plate per AMS 2404 Class 4, 0.001" minimum thickness.
4. Electro tin-lead plate per ASTM B579, 0.0001" to 0.0003" thickness.
5. Reflow (fuse) electro tin-lead plating.
6. Solderability to be per paragraph 4.2 herein.

3.16. 100-337-16, ELECTRO TIN-LEAD: Steel, Stainless Steel.

1. Nickel strike per AMS-QQ-N-290, 0.0001” to 0.0003” thickness.
2. Electroless nickel plate per AMS-C-26074 Grade B, 0.001” to 0.0015” thickness.
3. Copper plate per AMS 2418 Class 3, 0.0002” to 0.0005” thickness.
4. Tin-lead plate per AMS-P-81728, 0.0002” to 0.0005” thickness.
5. Within 48 hours of plating completion, bake plated parts at 120°F to 150°F for a minimum of 12 hours.
6. Remove all plating residues.
7. Solderability to be per paragraph 4.2 herein.

4. Quality Assurance Provisions.

4.1. Appearance

Unless otherwise specified, the finish shall have a uniform texture and appearance and shall be free of blisters, pinholes, and other defects that may affect the protective value of the coating.

4.2. Solderability

When soldering operations will be applied to the finish and the plating specification contains a solderability requirement, the solderability requirement of the specification must be met. If the plating specification does not contain a solderability requirement, the finish shall be capable of meeting the solderability requirements of MIL-STD-202, Method 208, less steam aging.

5. Packaging

5.1. Shipment to finish facility

The items shall be packaged in a manner to prevent damage to the item during routine handling and transport.

5.2. Return shipment from finish facility

The items shall be packaged in a manner to prevent damage to the item or the finish during routine handling and transport.

6. Notes

6.1. Order of precedence.

In the event of conflicting finish specifications, the following order of precedence shall apply.

1. The finish listed in the computer Bill of Material.
2. The finish listed on the detailed drawing.
3. Industry standards.

6.2. Finish Specifications.

Table 1 is a listing of standard finishes for the specific base materials.

| Table 1, Standard Finishes | | |
|----------------------------|---|------------------------|
| Dash # | Description | Base Material |
| -01 | Chemical Conversion Coat | Aluminum |
| -02 | Electro Tin, Reflowed (Threaded and Bulk Parts) | Brass, Copper, Steel |
| -03 | Hot Tin Dip | Brass Copper Steel |
| -04 | Electro Tin (Threaded parts) | Brass, Copper, Steel |
| -05 | Electro Tin | Stainless Steel |
| -06 | Electro Tin | Brass, Copper, Steel |
| -06I | Electro Tin, Matte | Brass, Copper, Steel |
| -06II | Electro Tin, Reflowed | Brass, Copper, Steel |
| -07 | Electro Tin | Aluminum |
| -08 | Electro Tin-Lead | Brass, Copper, Steel |
| -08I | Electro Tin-Lead, Matte | Brass, Copper, Steel |
| -08II | Electro Tin-Lead, Reflowed | Brass, Copper, Steel |
| -09 | Electro Tin-Lead | Aluminum |
| -09I | Electro Tin-Lead, Matte | Aluminum |
| -09II | Electro Tin-Lead, Reflowed | Aluminum |
| -09IIA | Electro Tin-Lead, Reflowed | Aluminum |
| -10 | See detailed drawing | Any |
| -11 | (Removed) | (Removed) |
| -12 | Electroless Nickel | Aluminum, Brass, Steel |
| -13 | Electro Tin-Lead | Stainless Steel |
| -13I | Electro Tin-Lead | Stainless Steel |
| -14 | Electrodeposited Silver | Aluminum |
| -15 | Electro Tin-Lead (Solder) | Aluminum |
| -15I | Electro Tin-Lead, Matte (Solder) | Aluminum |
| -15II | Electro Tin-Lead, Reflowed (Solder) | Aluminum |
| -16 | Electro Tin-Lead | Steel, Stainless Steel |