LOCKHEED MARTIN

Aeronautics Company – Fort Worth
FSCM 81755

FPS-3001G
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Superseding: FPS-3001F



Contractor's Finish Specification for F-16 Air Combat Fighter

Contract Number F33657-88-C-0037

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Finite Element Analysis,
and Materials and Processes

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CHANGE INDEX

This specification has been put into an updated electronic format, and is generally the same as the previous revision. Organization names have been updated, and typos corrected when found. Significant technical changes are as follows:

Paragraph	Change	Reason for Change
Tables I and II	Switched numbering of Tables to put in proper order	To put Table I first in the text with Table II following
3.6.1	Added NOTE after paragraph	To provide allowance to use procedures in MIL-STD-889 to protect against dissimilar metal contact when approved by LM Aero F-16 Materials and Processes Engineering
Table II	Changed No. 3 for additional clarification	To include dissimilarity between non-metallic materials and metals as a reason for referral to LM Aero F-16 Materials and Processes Engineering; Also, to cite MIL-STD-889 for additional information on non-metallic materials
3.6.2	Revised paragraph and added NOTE after paragraph	To clarify dissimilar metal contact protection in electrical bonding applications and to clarify the use of MIL-B-5087 in getting approval from LM Aero F-16 Materials and Processes Engineering
3.9.12	Added a second deviation under MIL-STD-889A Dissimilar Metals; renamed original deviation #1 and additional deviation #2	To provide allowance for use of conductive materials against aluminum structure for Dorsal Bay 7 parts and installations when equipped with a high frequency radio
Appendices	Deleted Appendix I and Appendix II	To remove unnecessary legacy information from the original document that fails to fit into the current specification format

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Contractor's Finish Specification for F-16 Air Combat Fighter

1 SCOPE

1.1 PURPOSE

This specification covers the detailed procedure to be followed for the Contractor* in the corrosion protection of the aircraft surfaces and component parts, including spares. The methods and materials required for cleaning, surface treatment, and application of finishes and protective coatings are included. All surfaces in contact with the airframe and component parts shall be protected in accordance with the requirements of this specification.

a. This specification does not apply to Government furnished equipment (power plants, engines, etc.), standard accessories and hardware purchased per government specifications (MIL-, MS, etc.), or other standard parts unless otherwise specified.

b. The Contractor is not required to refinish Government furnished equipment, Contractor purchased equipment or standard purchased accessories and hardware, provided the finish and color are acceptable to the Contractor and procuring activity, and that adequate protection against corrosion is afforded.

c. Purchased items or components may be exempted from FPS-3001 requirements only with specific written approval from LM Aero F-16 Materials and Processes Engineering.

* NOTE: The term Contractor is defined as the Weapon System Contractor; i.e., Lockheed Martin Aeronautics Company (LM Aero). Where the requirements of this specification are performed by Subcontractors, the term contractor shall be considered to apply to the subcontractor. The subcontractor shall be responsible to the contractor for meeting the requirements of this specification.

1.1.1 CORROSION PREVENTION AND CONTROL PLAN

This specification is prepared in accordance with the requirements of 16PP161, "Corrosion Prevention and Control Plan, F-16 Air Combat Fighter."

1.2 CLASSIFICATION

The protection of this aircraft and its component parts shall be of the following type:

MIL-F-7179 Type II – Protection for use under severe environmental conditions, except as noted herein.

1.3 PRECEDENCE

Where an apparent conflict is considered to exist between the contents of this specification and material specifications, process specifications, process standards or Engineering drawings, this specification shall take precedence and the area of conflict shall be brought to the immediate attention of LM Aero F-16 Materials and Processes Engineering for coordination and resolution. The nature of corrective action will be determined and effected.

1.4 SELECTION OF SPECIFICATIONS

The order of precedence for the selection of specifications and standards not referenced herein shall be as specified in MIL-STD-970.

1.5 MATERIALS

All materials used in finishing and coating of the aircraft and component parts shall conform to the requirements of the specifications approved by the Fort Worth Division.

1.6 WORKMANSHIP

MIL-F-18264 is an integral part of this specification and the application of all organic finishes prescribed herein shall be in accordance with MIL-F-18264. The contractor will, as far as practicable, conform to the requirements of MIL-F-18264. When an aircraft or components part is delivered to the Government, the protective coatings shall be suitable and satisfactory for service subject to contract guaranty. All surface treatments shall be performed in accordance with high-grade practice suitable for aircraft manufacture.

1.7 MATERIAL INSPECTION

No finishing work shall be accomplished prior to finishing materials approval. If the material fails to meet applicable specification requirements in any respect, the lot of material, as defined by the applicable specification shall be subject to rejection. Where material is rejected, any finishing accomplished using rejected materials may be required by the procuring activity to be refinished with approved materials.

1.8 PROTECTIVE SYSTEMS DEFINED

The protective systems specified herein are the minimum acceptable. The Contractor will endeavor to hold to this minimum in order to prevent addition of unnecessary weight except in special cases where maximum corrosion resistance is required.

1.8.1 PROTECTIVE SYSTEM THICKNESS

Unless otherwise specified, the dry film thickness of each specified coating material shall be as listed in Table I. Additional tolerance, as specified in FPS-3009 shall be allowed in all areas, except that the primer coating shall be a minimum thickness of 0.0004 inches for adequate corrosion protection.

TABLE I
COATING THICKNESS

Coating Specification	Specified Thickness	Tolerance (inches)	
		Minimum	Maximum
FMS-3027 Epoxy Primer,	One Coat		
MIL-P-23377 Epoxy Primer,	(no reactivation)	0.0006	0.0020
MIL-P-85582 Voc Compliant	(to be reactivated)	0.0004	0.00125
Epoxy Primer, or FMS-3035	(after reactivation)	0.0004	0.0025
Flexible Primer	Two Coats	0.0008	0.0025
MIL-C-83286 Urethane Coating	One Coat	0.0008	0.0030
	Two coats	0.0016	0.0044
MIL-C-22750 Epoxy Coating	One coat	0.0008	0.0025
MIL-L-81352 Acrylic Lacquer	Two Coats	0.0005	0.0015
FMS-1058-1LF Sealant Primer (Lead Free)	Mist Coat	Visual[1]	0.0005
	One Coat	0.0006	0.0015
MIL-C-85285 Urethane Coating	One or Two Coats	0.0016	0.0050
MIL-C-27725 Fuel Tank Coating	As Specified[2]	FPS-1004	FPS-1004
FMS-3014, Form 2, Primer	As Specified[2]	FPS-3035	FPS-3035
FMS-1027, Teflon Pigmented Coating	As Specified[2]	FPS-0004	FPS-0004
FMS-2026, Spectrally Selective coating	As Specified[2]	FPS-3076	FPS-3076
P6096 Optically Non-Reflective Coating	One or Two coats	0.0008	0.003

[1] The minimum thickness of a mist coating must be thick enough for visual coverage only.

[2] When used in areas not specifically identified, the coating thickness shall be the same as the specified areas.

1.9 METHOD OF SPECIFYING FINISHES

The various finishes as specified herein shall be called out in the finish column on the Parts List of the Engineering drawings in accordance with applicable codes established in 16PR070. Drawings shall reference FPS-3001 as the applicable document for finish codes. This document is contractual only to the extent that it interprets the finishing requirements for the F-16 airplane and provides a means of specifying the required finish on production drawings. Finish codes may be added, revised for clarification, or canceled within this document without formal ECP-SCN action, provided these changes are within the scope of the finish specification. The use of the finish codes for subcontractors not using Fort Worth Division drawing format is optional.

a. Finish codes to be specified only for limited aircraft effectivity may be added to 16PR070 provided the limitation is clearly defined.

b. Any area of apparent conflict between FPS-3001 and 16PR070 shall be brought to the immediate attention of LM Aero F-16 Materials and Processes Engineering for coordination and resolution. The nature of corrective action will be determined and effected.

2. APPLICABLE ISSUES

The publications listed below shall apply only as required within this document. Only issues listed in 16PR711, F-16 Materials Procurement and Processing Specifications Applicable Issues shall be used. The issue in effect on the date of invitation for bid or request for proposal shall apply if the publication is not listed in 16PR711. Usage of any other issues requires written approval from LM Aero before use. This specification shall govern if conflicts are found with any publication listed below.

2.1 GOVERNMENT DOCUMENTS

2.1.1 FEDERAL SPECIFICATIONS

QQ-P-35	Passivation Treatments for CRES
QQ-C-320	Chromium Plating (Electrodeposited)
QQ-P-416	Plating Cadmium (Electrodeposited)
P-D-680	Dry Cleaning Solvent
TT-P-1757	Primer Coating, Zinc Chromate, Low Moisture Sensitivity

2.1.2 MILITARY SPECIFICATIONS

Available from DODSSP, Subscriptions Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-M-3171	Magnesium Alloy, Process for Pretreatment and Prevention of Corrosion on
MIL-S-5002	Surface Treatments (Except Priming and Painting) for Metal and Metal Parts in Aircraft
MIL-B-5087	Bonding, Electrical, and Lightning Protection, for Aerospace Systems
MIL-E-5400	Electronic Equipment, Aircraft, General Specification for
MIL-C-5541	Chemical Conversion Coatings on Aluminum and Aluminum Alloys
MIL-F-7179	Finishes and Coatings; General Specification for Protection of Aircraft and Aircraft Parts
MIL-C-8514	Coating Compound, Metal Pretreatment, Resin-Acid (Asg)
MIL-A-8625	Anodic Coatings for Aluminum and Aluminum Alloys
MIL-C-8779	Colors, Interior, Aircraft, Requirements for
MIL-C-8837	Coating, Cadmium (Vacuum Deposited)
MIL-L-8937	Lubricant, Solid Film, Heat Cured
MIL-T-10727	Tin Plating; Electrodeposited or Hot Dipped, for Ferrous and Nonferrous metals
MIL-T-14757	Trichlorotrifluorethane
MIL-C-16173	Corrosion Preventive, Solvent Cutback, Cold Application
MIL-F-18264	Finishes; Organic Aircraft; Application and Control of

MIL-L-19537	Lacquer: Acrylic-Nitrocellulose, Gloss (For Aircraft Use)
MIL-C-22750	Coating, Epoxy-Polyamide
MIL-P-23377	Primer Coating, Epoxy-Polyamide, Chemical and Solvent Resistant
MIL-C-27725	Coating, Corrosion Preventive, for Aircraft Integral Fuel Tanks
MIL-C-38736	Cleaning Compound, Solvent; For use in Integral Fuel Tanks
MIL-M-45202	Magnesium Alloys, Anodic Treatment of
MIL-L-46010	Lubricant, Solid Film, Heat Cured, Corrosion Inhibiting
MIL-L-81352	Lacquer, Acrylic (For Naval Weapons Systems)
MIL-C-81706	Chemical Conversion Materials for Coating Aluminum and Aluminum Alloys
MIL-S-81733	Sealing and Coating Compound, Corrosion Inhibitive
MIL-C-81751	Coating, Metallic-Ceramic
MIL-C-83286	Coating, Urethane, Aliphatic Isocyanate, for Aerospace Applications
MIL-C-83488	Coating, Aluminum, High Purity
MIL-C-85054	Corrosion Preventive Compound, Water Displacing, Clear
MIL-C-85285	Coating: Polyurethane, High-Solids
MIL-P-85582	Primer coating: Epoxy, Voc Compliant, Chemical and Solvent Resistant

2.1.3 GOVERNMENT STANDARDS

FED-STD-595	Colors
MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-970	Standards and Specifications, Order of Preference for the Selection of
MIL-STD-889	Dissimilar Metals

2.1.4 GOVERNMENT HANDBOOK

MIL-HDBK-106	Multi-Level Continuous Sampling Procedures and Tables for Inspection by Attributes

2.1.5 PUBLICATIONS

AFSC DH 1-2	Design Handbook

2.2 NON-GOVERNMENT DOCUMENTS

2.2.1 LM AERO DOCUMENTS

Available from LM Aero Service Library, P. O. Box 748, MZ 1519, Fort Worth, TX 76101.

FMS-0025	Tape, Polyurethane, Rain Erosion Resistant
FMS-1027	Tetrafluoroethylene Pigmented Coating Material
FMS-1044	Sealing Compound, Integral Fuel Tank, and Fuel Cell Cavities, Intermittent Use Up to 360ºF
FMS-1047	Temporary Marking Coating

FMS-1058	Primers for Sealants
FMS-2004	Cleaning Solvent, General Purpose, Low Vapor Pressure
FMS-2026	Spectrally Selective Coating
FMS-3014	Nitrile – Phenolic Adhesive, Elevated Temperature curing, Metal-To-Metal Application in Aircraft Integrated Fuel Tanks
FMS-3018	Structural Adhesive, Intermediate Cure Temperature, Metal-To-Metal and Composite Applications
FMS-3027	Primer Coatings: Epoxy-Polyamide Chemical and Solvent Resistant (A Modification of MIL-P-23377D)
FMS-3035	Primer Coatings: Flexible Corrosion Inhibiting
FMS-3055	Sealant, Corrosion Inhibiting
FPS-0004	Application of Teflon Pigmented Coatings
FPS-0030	Plating, Electrodeposited Tin on Ferrous Alloys
FPS-0089	Application of Polyurethane Rain Erosion Resistant Tape
FPS-0116	Application of Conversion Coatings on Titanium Alloys
FPS-1003	Sealing Specification – Pressurized and Non-Fuel Areas
FPS-1004	Sealing Specification – Integral Fuel Tanks
FPS-1007	Cadmium Plating (Electrodeposited) Steel Alloys,180-240 KSI F_{tu}
FPS-1032	Shot Peening of Metal parts
FPS-1046	Brush Plating
FPS-3004	Chromium Plating (Electrodeposited)
FPS-3005	Coating, Nickel Phosphorous, Electroless Nickel Requirements for
FPS-3006	MIL-L-8937 Solid Film Lubricant, Application of
FPS-3007	Passivation of Corrosion Resistant Steel
FPS-3008	Design, Manufacture and Application of Markings
FPS-3009	F-16 Prime and Topcoat Application
FPS-3020	Cleaning, Descaling, and Passivation of Corrosion Resistant Steels
FPS-3024	Electrical Bonding Requirements for F-16 Air Combat Fighter
FPS-3035	Process and Quality Control-Adhesively Sealed Integral Fuel Tank Applications
FPS-3045	Procedures for Application of Rain Erosion Coatings
FPS-3076	Application and Processing of Spectrally Selective Coatings
FPS-3083	Glass Bead Peening
P5438	Polyurethane Rain Erosion Coating
P6096	Coating Optically Non-reflective, Black
P6174	Cleaner Solvent Non-Aromatic Naphtha Base
P6228	Cleaner, Solvent, Freon-Base with Mil Spec Cleaner

P6230	Cleaner, Solvent, Freon-Base with MEK
16N0001	Finishing of F-16 Airplanes
16N0002	Marking of F-16 Airplanes
16PP161	Corrosion Prevention and Control Plan, F-16 Air Combat Fighter
16PR070	Finish Codes for F-16 Finish Specification FPS-3001
16PR711	F-16 Material Procurement and Processing Specification Applicable Issues
T.O. 1-1-4	Exterior Finishes, Insignia and Markings Applicable to Aircraft and Missiles

2.2.2 SUNDSTRAND AEROSPACE DOCUMENTS

MS37.09-01	Enamel, Epoxy Base, White
MS37.14	Primer, Epoxy Base
MS37.15	Enamel, Epoxy Base, Black
PN14.05-01	Magnesium Surface Treatment, Phosphate Conversion Coating
2989-10/11-12	Sundstrand Aerospace Materials and Engineering Department Technical Report

2.2.3 GOODRICH AEROSTRUCTURES DOCUMENTS

RMS 058	350ºF Service Temperature, Structural Adhesive, Environmentally Resistant
RMS 413	Intermediate Temperature Service Structural Paste Adhesives (Up To 250ºF Curing Temperature)
RPS 17.23	Surface Preparations of Metals for Adhesive Bonding
RPS 24.05-2	Structural Adhesive Bonding of F-16 GRID-LOCK Assemblies

2.2.4 INDUSTRY DOCUMENTS

AMS-2410	Silver Plating (Nickel Strike)
AMS-2412	Silver Plating (Copper Strike)

3. GENERAL REQUIREMENTS

3.1 CLEANING AND SURFACE TREATMENT

Materials and processes used in cleaning shall have no deleterious effect on the properties of the metal and shall produce a surface satisfactory for applying the specified surface treatment in accordance with MIL-S-5002. Approval of cleaning materials shall be in accordance with 16PP161. Parts shall receive a thorough rinse after cleaning. Cleaned parts shall be free from rust, scale, paint, grease, oil, flux, and other foreign matter. All parts shall be given the specified surface treatment as soon as practicable after cleaning.

3.1.1 CLEANING AND SURFACE TREATMENT FOR ALUMINUM ALLOYS

Aluminum alloys shall be treated, except as noted in 3.1.1.1 through 3.1.1.5, as follows:

a. Clean with mild abrasive (ref. 3.1.9), solvents, vapor, or solution degreasing, or inhibited alkaline cleaners or approved acid cleaners. When an uninhibited alkaline etching solution is used for controlled metal removal, the basis metal shall be treated with an acid de-oxidizing bath to remove any characteristic surface smut.

b. Surface treatments for aluminum alloys (See Paragraph 3.9.2 and 3.9.3 for minimum quality control requirements).

(1) Bare 2000 series and 7000 series – Anodize (chromic or sulfuric acid) per MIL-A-8625 Type I, IB, IC, II or IIB, Class 1 or 2.

Exceptions: (a) For fatigue or fracture critical aluminum parts the anodic coating weights for Type IC or IIB shall be 600 mg/ft^2 maximum. The Type II anodize shall not be used.

(b) MIL-C-84388 Type II, Class 1, 2 or 3 or MIL-C-5541 Class 3 may be used as an alternate to anodize for electrical bonding areas.

(2) Deleted

(3) Clad aluminum alloys and inherently corrosion resistant alloy of the 1000, 3000, 5000 and 6000 series and aluminum alloy castings – chemical film treat per MIL-C-5541 using materials conforming to MIL-C-81706.

(4) Exterior surfaces of adhesive bonded assemblies and spot-welded or lap welded assemblies – Chemical film treat per MIL-C-5541 using materials conforming to MIL-C-81706. The exterior surfaces of adhesive bonded assemblies may be coated with FMS-3018 Form II corrosion-inhibiting primer in lieu of the MIL-C-5541 chemical film.

3.1.1.1 Oxygen system tubing shall not receive surface treatments on I.D. surfaces of the tubing.

3.1.1.2 Nonstructural aluminum alloy tubing, i.e., pneumatic, pitot, fuel and oil, shall not require full coverage of surface treatments (MIL-C-5541, MIL-A-8625 or MIL-C-83488) on I.D. Surfaces. (See deviation paragraph 3.9.8)

3.1.1.3 Structural aluminum alloy tubing sealed by welding shall not require finishing on the I.D. surfaces. Interior surfaces (I.D.) of structural aluminum alloy tubing shall be finished with the general schedule for interior surfaces of the airplane insofar as practicable.

3.1.1.4 Special surface treatments and applications on aluminum alloys shall be in accordance with the following specifications as required:

a. FPS-3005, Class 1, Electroless Nickel Plating.

b. MIL-A-8625, Type III, Hard Anodic Coating *(unsealed).

*Hard anodic coatings shall not be used on aluminum parts which may be expected to require restoration of dimensions as a result of wear. These parts shall be chromium plated.

3.1.1.5 Surfaces of parts which are not anodized due to configuration (unable to rack parts, trimmed edges or surfaces, need to avoid surface gas entrapment, etc.) shall be finished as follows:

a. Exposed metal edges or surfaces shall be solvent cleaned and dried.

b. Apply brush chemical film treatment per MIL-C-5541.

3.1.2 CLEANING AND SURFACE TREATMENT FOR TITANIUM ALLOYS

Titanium alloys shall be treated, except as noted in 3.1.2.1, as follows:

a. Clean with abrasive (ref. 3.1.9), solvents, vapor or solution degreasing, or mild inhibited alkaline cleaners. Titanium alloys exposed to service temperatures exceeding 550ºF shall not be cleaned or degreased with halogenated hydrocarbons unless immediately followed by an alkaline dip.

3.1.2.1 Titanium alloys used in hydraulic valves and fitting applications shall be treated as follows:

a. FPS-0116 Conversion Coating.

3.1.3 CLEANING AND SURFACE TREATMENT FOR CORROSION-RESISTANT STEEL ALLOYS

Corrosion-resistant steel alloys and their fusion welded assemblies shall be treated as follows, except as noted in 3.1.3.1, 3.1.3.2, 3.1.3.3 and 3.1.3.4:

a. Clean with mild abrasive (ref. 3.1.9), solvent, vapor or solution degreasing or inhibited cleaners.

b. 300 and 400 series and precipitation-hardened corrosion resistant steels shall be passivated in accordance with QQ-P-35, FPS-3007, FPS-3020, or by methods approved by the F-16 Corrosion Prevention and Control Team, followed by a thorough rinsing and drying. Solutions used for passivation per QQ-P-35 or FPS-3007 shall not etch steels (See deviation Paragraphs 3.9.7 and 3.9.9).

3.1.3.1 Carburized or nitrided surfaces or surfaces to be carburized or nitrided shall not be passivated.

3.1.3.2 Corrosion-resistant steel castings shall not be passivated, but shall be protected and cleaned per 3.4.4.

3.1.3.3 Silver soldered joints and spot welded assemblies shall not be passivated.

3.1.3.4 Assemblies containing crevices, slip joints and bellows which might trap cleaning and/or passivation solution shall not be passivated without specific written approval from LM Aero F-16 Materials and Processes Engineering.

3.1.3.5 Rough forgings, forged bar, and rolled plate shall be descaled or machined on all surfaces prior to passivation. Descaling shall be in accordance with FPS-3020 or methods approved by LM Aero F-16 Materials and Processes Engineering.

NOTE: Parts descaled and cleaned per FPS-3020 are adequately passivated, and require no additional passivation provided there are no subsequent machining operations.

3.1.4 CLEANING AND SURFACE TREATMENT FOR NON-CORROSION-RESISTANT STEEL ALLOYS

Non-corrosion-resistant steel alloys other than springs shall be treated, except as noted in 3.1.4.4 through 3.1.4.10, in accordance with 3.1.4.1, 3.1.4.2 and 3.1.4.3 (Refer to 3.6.3.1 for non-corrosion-resistant steel springs).

3.1.4.1 Non-corrosion-resistant steel alloys whose maximum ultimate tensile strength is 180,000 psi or less shall be treated as follows:

a. Clean with abrasive (ref. 3.1.9), solvents, vapor or solution degreasing or inhibited alkaline cleaner.

b. QQ-P-416, Class 2, Type II, Cadmium Plate; or MIL-C-83488, Class 3, Type II, Aluminum Ion Vapor Deposition, followed by FPS-3083 Glass Bead Peening.

3.1.4.2 Non-Corrosion-resistant steel alloys whose ultimate tensile strength range is 180,000 to 220,000 psi shall be treated as follows:

a. Clean with abrasive (ref. 3.1.9), solvents, vapor or solution degreasing or inhibited alkaline cleaner.

b. Plate in accordance with FPS-1007, Grade A, Type II, Class 2 Cadmium Plate except 10 Nickel Steel (HY 180); or coat per MIL-C-83488, Class 3, Type II, Aluminum Ion Vapor Deposition, followed by FPS-3083 Glass Bead Peening.

3.1.4.3 Non-corrosion-resistant steel alloys whose ultimate tensile strength range is 220,000 psi or greater shall be cleaned and cadmium plated per one of the following two specifications:

a. FPS-1007 Grade B, Type II, Class 2 for electrolytic cadmium plating. (Method is restricted to the 220,000 – 240,000 psi strength level per FPS-1007.)

b. Parts heat treated to the 220,000 – 240,000 psi ultimate tensile strength range that are plated in facilities not qualified as required by (a), and parts heat treated to ultimate tensile strengths greater than 240,000 psi, shall be plated in accordance with MIL-C-8837, Type II, Class 2 Vacuum Cadmium Plating; or coat per MIL-C-83488, Class 3, Type II, Aluminum Ion Vapor Deposition, followed by FPS-3083 Glass Bead Peening.

3.1.4.4 Sintered bearings of the oil-impregnated type shall not be plated.

3.1.4.5 Unless otherwise specified by applicable drawings, portions of members or parts which act as journals or bearing surfaces need not be plated.

3.1.4.6 Surfaces continually in contact with grease, lubricating oil or hydraulic fluid shall not be cadmium plated.

3.1.4.7 Welded assemblies which cannot be thoroughly cleaned to insure removal of plating solutions from all pockets shall not be plated by electrolytic processes.

3.1.4.8 Parts which are exposed in service to temperature above 450ºF shall not be cadmium plated.

3.1.4.9 The interior of steel tubular assemblies not entirely closed by welding shall be finished in the same manner as exterior surfaces, insofar as practicable. Assemblies completely closed by welding or to which application of primer is not practicable or not effective, such as crimped-end tubing not closed by welding, or tubing heat treated after assembly, shall be treated after assembly (and heat treatment, if performed) with a suitable corrosion preventive conforming to MIL-C-16173, Grade 1. The liquid shall be applied under pressure into the hollow member through holes* drilled therein. Parts in process of treatment shall be manipulated to insure complete coating of the interior surfaces with liquid. The members shall be thoroughly drained after treatment and wiped free of compound on all exterior surfaces. All access holes drilled in the members shall be closed with cadmium or zinc plated self-tapping screws or equivalent. Solder shall not be used to close the holes. Tubing completely closed by flash welding shall not be treated.

* Size and location shall be specified on Engineering drawings.

3.1.4.10 When a specific surface treatment is specified for non-corrosion-resistant steel alloys, the alloys shall be prepared and finished in accordance with the following applicable specifications:

a. Chromium Plating: QQ-P-320, Class 2d for strength levels through 240 ksi on parts which are not subjected to significant tensile or dynamic stresses.

   FPS-3004 shall be used for strength levels of 180 ksi through 240 ksi on parts which are subjected to significant tensile or dynamic stresses and on all parts heat treated to above 240 ksi.

b. FPS-3005, Class 1 or 2 Electroless Nickel Plating** (The plating thickness shall be minimum of 0.0015 inch).

** Limited to steel alloy heat treated to 240,000 psi maximum unless otherwise approved by LM Aero F-16 Materials and Processes Engineering.

c. FPS-0030 Tin Plating.

d. FPS-1046 Brush Plating.

3.1.5 CLEANING AND SURFACE TREATMENT FOR COPPER ALLOYS

Copper alloys shall be treated, except as noted in 3.1.5.1 through 3.1.5.4 as follows:

a. Clean with solvents, vapor, or solution degreasing, inhibited alkaline cleaners, or approved acid cleaners.

b. QQ-P-416, Class 2, Type II Cadmium Plating; or MIL-C-83488, Class 3, Type II, Aluminum Ion Vapor Deposition, followed by FPS-3083 Glass Bead Peening.

3.1.5.1 Copper alloy fluid lines, turnbuckles, springs, and tube fittings shall not be plated.

3.1.5.2 Copper alloy press fit brushings, except those used with aluminum, need not be plated.

3.1.5.3 Copper alloy parts used in electrical systems, except those used in aluminum alloy connections, shall not be plated.

3.1.5.4 When a specific surface treatment is specified for copper alloys, the alloys shall be prepared and finished in accordance with the following applicable specifications:

a. AMS-2410 or 2412, as applicable to the heat treat requirements, Silver Plating.

b. FPS-3005, Class 1, Electroless Nickel Plating.

c. MIL-T-10727 Tin Plating.

3.1.6 CLEANING AND SURFACE TREATMENT FOR NICKEL ALLOYS

Nickel alloys shall be treated as follows:

a. Clean with mild abrasive (ref. 3.1.9), solvents, vapor or solution degreasing, or inhibited alkaline cleaners.

3.1.7 CLEANING AND SURFACE TREATMENT FOR MAGNESIUM ALLOYS

Magnesium alloys shall be treated, except as noted in 3.1.7.1 as follows:

a. Clean with solvent, vapor or solution degreasing, or acid cleaners.

b. MIL-M-45202 Type I, Class A or C, or Type II, Class A, D, or E Anodic Treatment.

3.1.7.1 All cut, drilled, trimmed, or scarfed edges shall be treated with a brush application of chrome pickle solution in accordance with MIL-M-3171, Type I.

3.1.8 CLEANING AND SURFACE PREPARATION OF GRAPHITE COMPOSITES AND GLASS REINFORCED PLASTIC PARTS

Surfaces of graphite composites and glass reinforced plastic parts requiring subsequent coatings for appearance and graphite composites requiring a subsequent coating for dissimilar metal applications shall be treated as follows:

a. Lightly sand, using 320 grit sandpaper.

b. Solvent wipe with solvent such as methyl ethyl ketone or MIL-T-14757 or P6228-1 or P6230-1 or FMS-2004, then wipe dry.

3.1.9 ABRASIVE CLEANING AND CONTROL

3.1.9.1 Abrasive cleaning may be accomplished by abrasive blasting, brushing, sanding (hand or powered) or using commercial cleansing powders (such as Dutch Cleanser, Ajax, etc.), polishes or non-metallic cleansing pads (such as Scotch-Brite, etc.).

3.1.9.2 Mild abrasive cleaning is accomplished using cleansing powders, polishes or non-metallic cleansing pads, sanding with fine or grit sandpaper, abrasive blasting using fine mesh (finer than 120) grit or glass beads, low air pressure (less than 50 psi) or with increased distance between blast nozzle and work piece or any combination of these abrasive blasting parameters.

3.1.9.3 Abrasive coarser than 120 grit shall not be used unless specified by the Engineering drawing or other authorized Engineering documentation.

3.1.9.4 Abrasive used on ferrous materials shall not be used on non-ferrous materials.

3.1.9.5 Metallic abrasive shall not be used on non-ferrous materials.

3.1.9.6 Abrasives which accelerate corrosion are prohibited.

3.1.9.7 The use of steel wool or steel brushes is specifically prohibited on all metals except low alloy steels.

3.2 BASIC EXTERIOR FINISH

Unless otherwise specified by applicable drawings and except as noted in 3.6, the exterior finish shall be applied to the completed aircraft in accordance with 3.2.2 through 3.2.7 as specified in 3.7.18 and 3.7.19. The number of coats of primer and coatings to be used is specified below, except that an additional coat of primer is required for reactivation of the previously applied primer coating. FMS-3035 Flexible Primer may be substituted for FMS-3027 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer where approved by LM Aero F-16 Materials and Processes Engineering. Manufactured or bucked heads of aluminum rivets installed at the assembly level, countersinks, counterbores and edges of parts trimmed at assembly shall be touched up in accordance with the applicable finish requirements for the detail part or assembly. Touchup of manufacturing discrepancies shall be such that the total thickness of coating shall not exceed that obtained by one additional coat of primer or coating in the touchup area. Efforts shall be made to keep the coatings to their minimum thickness.

3.2.1 EXTERIOR SURFACES DEFINED

All surfaces that are normally exposed to the external environment during flight or on the ground, including the interior surfaces of removable doors, shall be considered as exterior surfaces, i.e., interiors of wheel wells and other fairings, and doors, covers of speed brakes and speed brake cavities, trailing edge flaperons, leading edge flaps, air intake ducts, interior of weapons bay, interior surfaces of the in-flight

refueling compartment, EPU compartment, interior of equipment bays (including electrical and avionics bays) normally open for preflight check or engine starting.

3.2.2 EXTERIOR FINISH FOR ALUMINUM ALLOY

Aluminum alloys shall be finished as follows:

a. Clean and surface treat per 3.1.1.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer or FMS-3035 Flexible Primer (1 coat).

(1) Fuel tank coating, MIL-C-27725 or FMS-3014, Form 2, Nitrile-Phenolic Primer applied to common detail parts may be used as a pre-coat prior to application of the epoxy primer in compartments defined in 3.3.3.1 through 3.3.3.3.

(2) FMS-3014, Form 2, Nitrile-Phenolic Primer applied to common detail exterior skins may be used as a pre-coat prior to application of the epoxy primer.

c. MIL-C-83286 or MIL-C-85285 Urethane Coating (2 coats). Refer to 3.3.3 for color.

3.2.3 EXTERIOR FINISH FOR TITANIUM ALLOYS

Unless left unfinished for heat resistance as defined in 3.3.1, titanium alloys requiring painting for appearance shall be finished as follows:

a. Clean and surface treat per 3.1.2.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-C-85582 Voc Compliant Epoxy Primer (1 coat).

c. MIL-C-83286 or MIL-C-85285 Urethane Coating (2 coats) (refer to 3.3.3 for color).

3.2.4 EXTERIOR FINISH FOR CORROSION-RESISTANT STEEL ALLOYS

Unless left unfinished for heat resistance as defined in 3.3.1, corrosion-resistant steel alloys requiring painting for appearance shall be finished as follows:

a. Clean and surface treat per 3.1.3.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat).

c. MIL-C-83286 or MIL-C-85285 Urethane Coating (2 coats) (refer to 3.3.3 for color).

3.2.5 EXTERIOR FINISH FOR PLATED ALLOYS

Unless otherwise specified by 3.3.1, plated alloys shall be finished as follows:

a. Clean and surface treat per 3.1 in accordance with alloy.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat).

c. MIL-C-83286 or MIL-C-85285 Urethane Coating (2 coats) (refer to 3.3.3 for color).

3.2.6 EXTERIOR FINISH FOR ALL OTHER ALLOYS

Unless otherwise specified by 3.3.1, all other alloys including 10 Nickel (HY180) alloy shall be finished as follows:

a. Clean and surface treat per 3.1 in accordance with alloy.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat).

c. MIL-C-83286 or MIL-C-85285 Urethane Coating (2 coats) (refer to 3.3.3 for color).

3.2.7 EXTERIOR FINISH FOR COMPOSITES AND REINFORCED PLASTICS

(Other than radomes and reinforced plastic parts with exposure to line of flight of greater than 15 degrees) shall be finished as follows: Refer to 3.3.6 for other finish requirements.

a. Clean and surface treat per 3.1.8

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat).

c. MIL-C-83286 or MIL-C-85285 Urethane Coating (2 coats) (Refer to 3.3.3 for color).

3.3 SPECIAL EXTERIOR FINISH

The number of coats of primer and coatings to be used is specified below, except that an additional coat of primer is required for reactivation of the previously applied primer coating. FMS-3035 Flexible Primer may be substituted for FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer where approved by LM Aero Materials and Processes Engineering. Manufactured or bucked heads of aluminum rivets installed at the assembly level, countersinks, counterbores and edges of parts trimmed at assembly shall be touched up in accordance with the applicable finish requirements for the detail part or assembly. Touchup of manufacturing discrepancies shall be such that the total thickness of coating shall not exceed that obtained by one additional coat of primer or coating in the touchup area. Efforts shall be made to keep the coatings to their minimum thickness.

3.3.1 EXTERIOR FINISH FOR EXPOSURE ABOVE 500ºF

Corrosion resistant alloy surfaces subject to thermal environments above the thermal capability of the MIL-C-83286 or MIL-C-85285 Urethane Coating shall not require additional finishes. Non-corrosion-resistant alloys subject to such environments shall be finished with a Contractor and procuring activity approved material.

3.3.2 SEALING

Exterior joints, seams and faying surfaces shall be designed to prevent water from entering the interior of the aircraft, insofar as possible, and sealed in accordance with FPS-1003 or FPS-1004 as applicable.

3.3.3 EXTERIOR COLORS

The basic colors for the aircraft shall be noted on 16N0001, except as noted in 3.3.3.1 through 3.3.3.4. The basic colors for external pylons and fuel tanks, except as noted in 3.3.3.5, shall be as noted on their drawing or procurement specifications as applicable.

3.3.3.1 Landing gear wheel wells and compartments - The landing gear wheel wells and components therein are exterior surfaces as noted in 3.2.1 and shall be finished as noted in 3.3.3.1.1 and 3.3.3.1.2.

3.3.3.1.1 Wheel Wells - Structural members forming the wheel well box or cavity and external surfaces (O.D.) of tubing (except CRES tubing which requires no external finish) located in the wheel well shall be finished as follows:

a. Clean and surface treat per 3.1.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat). Faying surfaces of detail parts, if not topcoated, shall have the number of coats of primer as required for interior parts per 3.4.

c. MIL-C-83286 or MIL-C-85285 Urethane Coating Color 17875 White (2 coats) may be applied in detail or after assembly and prior to installation of components in the bay.

3.3.3.1.2 Components - Exposed surfaces of components, i.e., actuators, valves, electrical and electronic equipment etc., located in the wheel well shall be finished at the detail part or assembly level as follows:

a. Clean and surface treat per 3.1 or MIL-E-5400, as applicable.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat).

c. MIL-C-83286 or MIL-C-85285 Urethane Coating Color 17875 White (2 coats).

3.3.3.2 Equipment and ammunition bays, in flight refueling compartment and components, gun compartment and components - Equipment bays and ammunition bays, in-flight refueling compartment and components, gun compartment and components located therein are exterior surfaces as noted in 3.2.1 and shall be finished as noted in 3.3.3.2.1 and 3.3.3.2.2.

3.3.3.2.1 Compartment and bays - Structural members forming the compartment and bays and exterior surfaces (O.D.) of tubing (except CRES tubing which requires no external finish) located in the bays shall be finished as follows:

a. Clean and surface treat per 3.1

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat). (Faying surfaces of detail parts, if not topcoated, shall have the number of coats of primer as required for interior parts per 3.4).

c. MIL-C-83286 or MIL-C-85285 Urethane Coating Color 17875 White (2 coats) may be applied in detail or after assembly and prior to installation of components in the bay.

d. MIL-L-81352 Lacquer Color 17875 White (2 coats) may be used as an alternate for MIL-C-83286 or MIL-C-85285 Urethane Coating Color 17875 White (2 coats) as the topcoat for the interior of avionic equipment bays only and may be applied in detail or after assembly and prior to installation of components in the bays.

3.3.3.2.2 Components - Exposed surfaces of components, i.e., actuators, valves, electrical and electronic equipment etc., located in the bays shall be finished at the detail part or assembly level as follows:

a. Clean and surface treat per 3.1 or MIL-E-5400, as applicable.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat).

c. MIL-C-22750 Epoxy Coating, MIL-C-85285 or MIL-C-83286 Urethane Coating, Color No. 36231 Gray (1 coat).

3.3.3.3 Control surface hinges, trailing edge flaperons and leading edge flaps - That portion of control surface assemblies are exterior surfaces as noted in 3.2.1 and shall be finished as noted in 3.3.3.3.1 and 3.3.3.3.2.

3.3.3.3.1 Cove Area - Exposed surfaces in the cove areas shall be finished as follows:

a. Clean and surface treat per 3.1.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat) Faying surfaces of detail parts, if not topcoated, will receive the number of coats of primer as required for interior parts per 3.4.

c. MIL-C-83286 or MIL-C-85285 Urethane Coating Color 17875 White (2 coats) may be applied in detail or at the applicable control surface drawing level.

3.3.3.3.2 Components - Exposed surfaces of components, i.e., actuators, push-pull rods, mounting brackets, etc., located in the cove areas shall be finished as follows:

a. Clean and surface treat per 3.1 or MIL-E-5400 as applicable.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat).

c. MIL-C-83286 or MIL-C-85285 Urethane Coating Color 17875 White (2 coats) shall be applied at the detail part or assembly drawing level.

3.3.3.4 Government Furnished Aircraft Equipment - GFAE components will not require additional finish except when the as received finish on this equipment is objectionable from the overall aircraft color scheme. In such cases, the applicable finish will be applied after installation.

3.3.3.5 Interior Surfaces of External Pylons - Interior surfaces of structural members forming the external pylons shall be finished as follows:

a. Clean and surface treat per 3.1.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat). Faying surfaces of detail parts, if not topcoated, shall have the required number of coats of primer as required for interior parts per 3.4.

c. MIL-C-83286 or MIL-C-85285 Urethane Coating (2 coats) of the color specified on the drawing may be applied in detail or after Assembly and prior to installation of the components.

3.3.4 IDENTIFICATION AND MARKINGS

Identification and markings shall be applied in accordance with 16N0002.

3.3.5 STABILIZER LEADING EDGES

The leading edges of the vertical stabilizer and horizontal stabilizer shall be finished with FMS-0025 rain erosion tape per FPS-0089 or P5438 rain erosion coating per FPS-3045 as noted on 16NXXXX.

3.3.6 RADOMES AND COMPOSITES AND REINFORCED PLASTIC PARTS WITH EXPOSURE TO LINE OF FLIGHT OF GREATER THAN 15 DEGREES

The exterior surfaces of these parts shall be finished with FMS-0025 rain erosion tape per FPS-0089 or P5438 rain erosion coating in accordance with 16N0001.

3.3.7 WALKWAYS

The walkway areas of the aircraft shall be identified in accordance with 16N0002 using a urethane coating conforming to MIL-C-83286 or MIL-C-85285.

3.3.8 ALUMINUM ALLOY PLUMBING

Aluminum alloy plumbing and tubing shall be finished as follows:

3.3.8.1 Interior installations

a. Clean and surface treat per 3.1.1 through 3.1.1.5.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat). Tubing using flared fittings shall be primed the entire length of the tubing except no primer shall be applied within 1 inch of the sealing surface. Primer shall not be applied to the interior of tubing.

c. Tubing assemblies within fuel tanks

(1) Exterior surfaces of tubing assemblies exposed to fuel which receive the chemical film coating per MIL-C-5541, shall be coated with MIL-C-27725 fuel tank coating, as specified on the Engineering drawing or LM Aero standard, to within a maximum of one inch of the sealing surface.

(2) Exterior surfaces of tubing assemblies exposed to fuel which receive an anodic coating per MIL-A-8625 or MIL-C-83488, Type I, do not require additional protection. The treatment is applied to tube details for unwelded assemblies or assembly details for butt welded assemblies prior to flaring or swaging of end fittings.

3.3.8.2 Exterior installations

a. Clean and surface treat per 3.1.1 through 3.1.1.5.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat). Tubing using flared fittings shall be primed the entire length of the tubing except no primer shall be applied within 1 inch of the sealing surface. Primer shall not be applied within interior of tubing.

c. MIL-C-83286 or MIL-C-85285 Urethane Coating (2 coats) (color to be determined in accordance with 3.3.3) shall be applied the full length of the tube except for the area from the sealing surface to one inch back of the fittings (tube sleeve).

3.3.9 CORROSION-RESISTANT ALLOY TUBING

Corrosion-resistant alloy tubing shall be finished as follows:

3.3.9.1 Interior Installations

a. Clean and surface treat per 3.1.3.

3.3.9.2 Exterior Installations

a. Clean and surface treat per 3.1.3.

3.3.10 EXTERIOR FINISH FOR SPECTRALLY SELECTIVE COATING

Final finishing of aircraft exterior may be accomplished using FMS-2026 in lieu of MIL-C-85285 Urethane topcoat where specified by the Engineering drawing and approved by the F-16 Signature Integration Review Team. Exterior aircraft surfaces for application of FMS-2026 shall be prepared per FPS-3076 and as noted on the applicable 16NXXXX Engineering drawings.

NOTE: The FMS-2026 coating is not applicable as a finish for radomes.

3.4 BASIC INTERIOR FINISH

Unless otherwise specified by applicable drawings and except as noted in 3.5 and 3.6 the interior finish shall be applied to detail parts in accordance with 3.4.2 through 3.4.8, however, the final coat of such parts may be applied after assembly. FMS-3035 Flexible Primer may be substituted for FMS-3027 Epoxy Primer or MIL-P-23377 Voc Compliant Epoxy Primer where approved by LM Aero F-16 Materials and Processes Engineering.

3.4.1 INTERIOR SURFACES DEFINED

All surfaces that are not classified as exterior surfaces shall be treated as interior surfaces.

3.4.2 INTERIOR FINISH FOR ALUMINUM ALLOYS

Aluminum alloys shall be finished as follows:

a. 1000, 3000, 5000 and 6000 series, clad 2000, and clad 7000 series wrought aluminum alloys.

(1) Clean and surface treat per 3.1.1

(2) FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 VOC Compliant Epoxy Primer or FMS-3035 (1 coat) (Fuel tank coating, MIL-C-27755 or FMS-3014, Form 2, Primer applied to common detail parts may be used as an alternate to the epoxy primer).

b. Nonclad 2000 and 7000 series and other high strength wrought aluminum alloys, and aluminum alloy castings (i.e., A356 and A357).

(1) Clean and surface treat per 3.1.1

(2) FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 VOC Compliant Epoxy Primer or FMS-3035 Flexible Primer (2 coats) (Fuel tank coating, MIL-C-27725 or FMS-3014, Form 2 Primer applied to common detail parts may be used as an alternate to the epoxy primer).

NOTE: As an alternate, one coat of FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer may be applied to the detail; the second coat of epoxy primer is applied after assembly.

c. Aluminum alloys 1100, 5052 and 6061 shim stock.

(1) No finish required.

3.4.3 INTERIOR FINISH FOR TITANIUM ALLOYS

Titanium alloys shall not require additional finishes.

3.4.4 INTERIOR FINISH FOR CORROSION-RESISTANT STEEL ALLOYS

Corrosion-resistant steel alloys, except 17-4PH castings and 400 series, other than 440, shall not require additional finishes. 17-4PH castings and 400 series, other than 440, shall be treated as follows:

a. Corrosion Preventative Coating per MIL-C-16173, Grade 1 or 4, shall be applied at the foundry for protection of rough castings or parts during shipping, storage, etc.

b. Remove MIL-C-16173 Compound with P-D-680 Solvent or MIL-T-14757 or P6228-1 or P6230-1 or FMS-2004 or by vapor degreasing or alkaline cleaning.

c. Apply FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat) or MIL-C-85054 corrosion preventive compound.

3.4.5 INTERIOR FINISH FOR PLATED ALLOYS

Plated alloys shall be finished as follows:

a. Clean and surface treat per 3.1.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat).

3.4.6 INTERIOR FINISH FOR MAGNESIUM ALLOYS

Magnesium alloys shall be finished as follows:

a. Clean and surface treat per 3.1.7.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (2 coats).

c. MIL-C-22750 Epoxy, MIL-C-85285 or MIL-C-83286 Urethane Coating, Color No. 11136 Red (1 coat), unless otherwise specified on the applicable drawing.

3.4.7 INTERIOR FINISH FOR ALL OTHER ALLOYS

All other metal alloys shall be finished as follows:

a. Clean and surface treat per 3.1 in accordance with basic metal.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat) for all other alloys, except 10 Nickel (HY 180) alloy will receive 2 coats of primer.

c. MIL-C-22750 Epoxy, MIL-C-85285 or MIL-C-83286 Urethane Coating (1 coat). Color to be in accordance with 3.5.4.

3.4.8 INTERIOR FINISH FOR GRAPHITE COMPOSITES AND GLASS REINFORCED PLASTICS

Graphite composites and glass reinforced plastic parts do not require subsequent coatings except in areas for appearance. Graphite composites involved in dissimilar metal contact require one coat of primer on the faying surfaces per 3.6.1. When coatings are required, they shall be finished as follows:

a. Clean and surface treat per 3.1.8.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat).

c. MIL-C-22750 Epoxy, MIL-C-85285 or MIL-C-83286 Urethane Coating or P6096 urethane (1 coat). Color to be in accordance with 3.5.4.

3.5 SPECIAL INTERIOR FINISH

3.5.1 INTERIOR FINISH FOR THERMAL EXPOSURE ABOVE 500ºF

Corrosion resistant alloy surfaces subject to thermal environments above the thermal capability of epoxy primer shall not require additional finishes. Non-corrosion resistant alloys and 17-4PH castings subject to such environments shall be finished with MIL-C-81751 coating.

3.5.2 FUEL TANK INTERIOR

The inside surface of integral and external fuel tanks shall be finished with MIL-C-27725 coating or FMS-3014, Form 2, Primer and sealed to prevent corrosion and leakage of fuel per FPS-1004 or adhesively sealed per FPS-3035.

3.5.3 INTERIOR FINISH FOR CREW COMPARTMENT

The crew compartment shall be finished as follows:

a. Clean and surface treat per 3.1 in accordance with basic alloy or material.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer or FMS-3035 Flexible Primer (1 coat).

c. MIL-C-22750 Epoxy, MIL-C-85285 or MIL-C-83286 Urethane Coating (1 coat). Color to be in accordance with 3.5.4.

3.5.4 INTERIOR COLORS FOR CREW COMPARTMENT

Crew compartment color scheme per Federal Standard 595 shall be as follows:

a. Medium Gray, Color 36231 – Instrument panels, floor, walls, non-upholstered seal, consoles, pedestals, foot pedals, knobs, handles, levers and all structure below the canopy sill. Also, see note.

b. Black, Color 37038 – Control grip, metal backing plates, edge-lighted panels, instrument cases and canopy frame surface under fixed transparencies, and canopy sill and all structure above canopy sill.

c. Orange-yellow, Color 13438 – Emergency exit releases and canopy locking control.

d. Alternating Orange-Yellow and Black, Color 13538 and 37038. Emergency controls shall be alternately striped in a three-to-one ratio, 45º from vertical with the black stripes being 1/16", 1/8", or 1/4" in width, rotated clockwise. The stripes shall be applied to the panel background of controls too small to be color-coded.

e. Optical nonreflective Black, Color 37038 (P6096-2) Glareshield and Pilot's display unit.

NOTE: When specified on the Engineering drawing, nonreflective Black, Color 37038 (P6096-2) may be substituted in areas specified in 3.5.4.a.

3.5.5 FIREWALLS

Firewalls and interior surfaces on the engine side thereof shall be finished as follows:

a. Alloys shall be finished in accordance with 3.4.2 through 3.4.6.

3.6 SPECIAL FINISHES

In cases of conflict between the requirements of this paragraph and the requirements specified elsewhere in this specification, the requirements of this paragraph shall prevail. FMS-3035 Flexible Primer may be substituted for FMS-3027 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer where approved by LM Aero F-16 Materials and Processes Engineering.

3.6.1 DISSIMILAR METALS

Dissimilar metals shall be as defined in accordance with Table II. Dissimilar metals (excluding fasteners which will be installed per 3.7.2) shall be insulated from contact by the application of at least two (2) coats of FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer with at least one coat being applied to the faying surface of each material in contact. One or more paint topcoats may be used in lieu of one coat of primer. Each metallic alloy shall have the required number of coats of primer applied as prescribed for basic interior finish per 3.4. Dissimilar metals in fuel tanks require no additional protection than the required application of fuel tank coating and sealant as specified on applicable drawings.

NOTE: The procedure listed in 3.6.1 is the preferred method of protection against dissimilar metal contact. If this procedure is not technically feasible, one or more procedures outlined in MIL-STD-889, Para. 5.2, may be incorporated to protect against dissimilar metal contact, with approval by LM Aero F-16 Materials and Processes Engineering.

TABLE II
GROUPING OF METALS AND ALLOYS

Group I	Magnesium and its alloys, Aluminum alloy 5052, 5056, 356, 6061 and 6063
Group II	Cadmium, zinc, and Aluminum alloys
Group III	Iron, Lead, and Tin and their alloys (except corrosion-resistant steel)
Group IV	Copper, Chromium, Nickel, Silver, Gold, Platinum, Titanium, Cobalt, and Rhodium and their alloys; Brass, corrosion-resistant steel, and Graphite

1. Metals classified in the same groups are considered as similar metals.
2. Materials classified in different groups are considered as dissimilar metals.
3. The classification of metallic alloys not listed herein, as well as non-metallic materials with the potential to initiate corrosion when joined with metals, shall be referred to LM Aero F-16 Materials and Processes Engineering. MIL-STD-889, Para. 5.1.6, offers additional guidance on non-metallic materials.

3.6.2 ELECTRICAL BONDING

Bonding and ground connections shall be finished per FPS-3024.

NOTE: Where electrical bonding or grounding requirements preclude the insulation of dissimilar metal contact as identified in 3.6.1, the preferred method of protection against dissimilar metal corrosion shall be to isolate the combination from exterior environments. If this procedure is not technically feasible or practical, procedures from MIL-B-5087, Para. 3.4.5 may be incorporated to minimize the possibility of corrosion, with approval by LM Aero F-16 Materials and Processes Engineering.

3.6.3 SPRINGS

Unless otherwise specified by applicable drawings, springs shall be finished per 3.6.3.1 and 3.6.3.2.

3.6.3.1 Noncorrosion resistant steel springs - All noncorrosion resistant steel springs shall be finished as follows:

a. QQ-P-416, Class 2, Type II or FPS-1007, Grade A, Class 2, Type II Cadmium Plate or MIL-C-83488, Class 3, Type II, Aluminum Ion Vapor Deposition followed by FPS-3083 Glass Bead Peening.

b. Bake at 375ºF for 3 hours immediately after cadmium plating.

c. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat) – Closely coiled springs shall be extended after baking to enable full surface coverage of the primer coating.

d. MIL-C-16173, Grade 4, Corrosion Preventive, Solvent Cut Back, Cold Application, may be used when specified in lieu of the epoxy primer.

3.6.3.2 Corrosion-resistant steel springs. Corrosion-resistant steel springs shall not require additional finishes unless in contact with dissimilar metals.

3.6.4 HINGE PINS

All piano type stainless steel hinge pins shall be finished as follows:

a. QQ-P-416, Class 2, Type I Cadmium Plate or MIL-C-83488, Class 3, Type II, Aluminum Ion Vapor Deposition followed by FPS-3083 Glass Bead Peening.

b. MIL-C-16173, Grade 3, Corrosion Preventive Compound, after assembly.

3.6.5 CHEMICAL PROOFING

Interior surfaces within 12 inches of storage batteries or parts further removed but subject to solution spillage or spray shall be finished as follows:

a. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat).

b. MIL-C-83286 or MIL-C-85285 Urethane Coating – white Color 17875 (2 coats).

3.6.6 CONTROL CABLES AND CHAINS

Control cables and control chains shall not be painted. Noncorrosion-resistant cable shall, at the time of installation, receive preservative coating with compound in accordance with Specification MIL-C-16173, Grade 4, and corrosion-resistant cable shall, at the time of installation, be touched up with compound in accordance with Specification MIL-C-16173, Grade 4, where the coating is damaged during installation.

3.6.7 SURFACE OF HEAT DUCTS

Interior and exterior surfaces of heat ducts shall be finished as follows:

a. Metal ducts which are not subjected to temperatures above 500ºF shall be finished in accordance with 3.4.2 through 3.4.6.

b. Ducting that will be subjected to temperatures above 500ºF shall be cleaned and treated in accordance with 3.1.

3.6.8 LUBRICATING OIL AND HYDRAULIC TANKS

The inside surface of oil tanks require no finish.

3.6.9 RUBBER

Natural and synthetic rubber shall not be painted, greased or oiled.

3.6.10 LUBRICATION COATINGS – SOLID FILM LUBRICANTS AND TEFLON PIGMENTED COATINGS

Parts requiring solid film lubricant shall be finished per FPS-3006. Parts requiring Teflon pigmented coatings shall be finished per FPS-0004.

3.6.11 ATTACHING PARTS

Attaching parts, i.e., nuts, bushings, shims (par. 3.4.2 (c)), washers, rivets, screws, bolts, sleeves, clamps, etc., need not be painted in detail except when they are installed in exterior locations as specified in 3.7.2 or when dissimilar metals are involved in the materials being joined together as specified in 3.6.1.

3.6.12 MISCELLANEOUS ALUMINUM ALLOY TANKS (WATER, ANTI-FREEZE, ALCOHOL, ETC)

The inside surface of miscellaneous aluminum alloy tanks require no paint coatings. If a coating is applied, the materials used shall be subject to approval by the procuring activity. The inside surfaces of potable water tanks shall not be surface treated. The interior of such tanks for other than potable water, shall receive treatment in accordance with either specification MIL-A-8625, MIL-C-83488 or MIL-C-5541 per 3.1.1.

3.6.13 ELECTRICAL AND ELECTRONIC EQUIPMENT (EXCEPT RADOMES AND ANTENNA COVERS)

The interior surface of electrical and electronic equipment shall be finished in accordance with MIL-E-5400.

3.6.13.1 Exterior surfaces of electrical and electronic equipment located in the Crew Compartment exposed area shall be finished as follows:

a. Clean and surface treat in accordance with MIL-E-5400.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat).

c. MIL-C-22750 Epoxy, MIL-C-85285 or MIL-C-83286 Urethane Coating, Color No. 37038 (1 coat), or P6096 urethane as applicable per 3.5.4.

3.6.13.2 Exterior surfaces of electrical and electronic equipment located in the wheel well area shall be finished as follows:

a. Clean and surface treat in accordance with MIL-E-5400.

b. FMS-3027 Epoxy Primer or MIL-P-23377 Voc Compliant Epoxy Primer (1 coat).

c. MIL-C-83286 or MIL-C-85285 Urethane Coating Color 17875 White (2 coats).

3.6.13.3 Exterior surface of electrical or electronic equipment located in areas not specified by 3.6.13.1 or 3.6.13.2 shall be finished as follows:

a. Clean and surface treat in accordance with MIL-E-5400.

b. FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer (1 coat).

c. MIL-C-22750 Epoxy, MIL-C-85285 or MIL-C-83286 Urethane Coating, Color No. 36231 Gray (1 coat).

3.6.13.4 Markings for electrical and electronic equipment shall be in accordance with MIL-E-5400 and FPS-3008.

3.6.14 SHOT PEENING

Shot peening shall be in accordance with FPS-1032 when specified and shall be accomplished prior to finishing of components.

3.6.14.1 Shot peening when required by the Engineering drawing shall take precedence over that required by any other specification or document such as material procurement, heat treat processing, and forging processes. Shot peening shall be accomplished after all operations such as heat treatment, machining, etc. and just prior to the application of the corrosion protection system.

3.6.15 MOLDED PLASTIC AND CERAMICS

Plastic transparent parts shall not be painted. Other plastic parts (except fiberglass laminates, antenna and magnetic airborne detector housing, and radome) need not be painted, except for color match or solvent protection. Plastic or ceramic insulators for radio antenna, etc., shall not be painted. (See 3.2.7 for the finishing requirements of composites and reinforced plastics.)

3.6.16 COATING FOR TEMPERATURE CONTROL

Surfaces subject to heating due to radiation from adjacent hot components or from exposure to a thermal pulse shall be finished with low absorption coatings. Each proposed use of coatings for control of temperature is subject to procuring activity approval.

3.6.17 MECHANICAL ATTACHMENT

Tubular parts which have fittings mechanically attached shall have all edges of the attachment sealed with FMS-1044 general purpose sealant in accordance with FPS-1003 or FPS-1004 as applicable.

3.7 MANUFACTURING AND DETAIL SPECIFICATION REQUIREMENTS

3.7.1 JOINTS AND FAYING SURFACES

The overlapping portion (faying surface) of all permanently installed components forming exterior metal joints and seams shall be sealed just prior to part installation. Fuel tank joints and faying surfaces shall be finished in accordance with FPS-1004 or FPS-3035. Pressurized and non-fuel joints and faying surfaces shall be finished in accordance with FPS-1003. The use of filling material for the purpose of sealing and concealing nicks, dents, gouges and poor joints is prohibited unless specifically approved by a Materials Review Board (MRB).

3.7.2 FASTENERS

Fasteners shall be installed as follows

3.7.2.1 Exterior surfaces of the airplane.

a. Permanently Installed Fasteners – All permanently installed fasteners shall be installed with wet FMS-3055 sealant in accordance with FPS-1003 for nonfuel areas or FPS-1004 or FPS-3035 for fuel areas as applicable.

   NOTE: For AME only, FMS-1044 may be substituted for FMS-3055.

b. Removable Fasteners (Boundary Structure and Exterior Surfaces) – Except in cases where Engineering drawings may specify installation with wet FMS-3055 sealant per FPS-1003 or FPS-1004, fasteners shall be installed after the fastener holes have been primed with FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer and dried.

   NOTE: For AME only, FMS-1044 may be substituted for FMS-3055.

c. Shaved heads and the break-off stems of steel blind fasteners shall be coated with one mist coat of FMS-1058-1 primer, then one coat of FMS-3035 Flexible Primer. Touchup must be accomplished within four (4) hours in an uncontrolled environment (outdoor) and in a controlled (indoor) environment may be delayed until the assembly receives its touchup requirements.

3.7.2.2 Interior surfaces of the airplane.

a. Permanently Installed Fasteners in Integral Fuel Tanks

   (1) Boundary Structure – Install with wet FMS-3055 sealant per FPS-1004 or install per FPS-3035.

   (2) Interior Connections – Install metal fasteners with wet FMS-3055 sealant per FPS-1004 or install per FPS-3035.

b. Permanently Installed Fasteners in Non-Fuel, Pressurized Areas.

   (1) Boundary Structure – Install with wet FMS-3055 sealant per FPS-1003.

   (2) Interior Connections – Install metal fasteners with wet FMS-3027 or MIL-P-23377 primer or wet FMS-3055 sealant per FPS-1003.

c. Permanently Installed Fasteners in Non-Fuel, Non-Pressurized Areas

   (1) Install metal fasteners with wet FMS-3027 or MIL-P-23377 primer or wet FMS-3055 sealant per FPS-1003.

d. Removable Fasteners (Interior Connections) – Except in cases where Engineering drawings may specify installation with wet sealant per FPS-1003 or FPS-1004, all removable fasteners shall be installed after the fastener holes have been primed with FMS-3027 or MIL-P-23377 Epoxy-Primer or MIL-P-85582 Voc Compliant Epoxy Primer and dried or by application of MIL-C-16173 compound.

e. The break-off stems of steel blind fasteners shall be coated with one mist coat of FMS-1058-1 primer, then one coat of FMS-3035 Flexible Primer. Touchup must be accomplished within four (4) hours in an uncontrolled environment (outdoor) and in a controlled (indoor) environment may be delayed until the assembly receives its touchup requirements.

3.7.3 SHARP EDGES

All exterior metal edges and all edges of magnesium sheet shall be rounded or chamfered to minimize edge effect which would result in non-coverage with paint at sharp edges.

3.7.4 USE OF SILICONE FLUIDS AND COMPOUNDS

The use of silicone fluids and compounds shall be avoided wherever possible due to the effect on paint adhesion. Adjacent areas shall be masked where design criteria dictates the use of silicone.

3.7.5 METAL PARTICLES

Precautions shall be taken in the fabrication and assembly stages, particularly in relatively inaccessible areas, to insure that metal particles, or pieces, such as chips, slivers, rivets, bolts, tools, filings, etc., do not remain in the aircraft. A vacuum cleaner providing strong suction shall be employed for frequent cleaning operations in such areas. Filing is not permitted on an assembly after it has been accepted.

3.7.6 USE OF STEEL WOOL

The use of steel wool is prohibited.

3.7.7 USE OF ALUMINUM WOOL

Only aluminum and non-metallic wool and brushes shall be used.

3.7.8 SLIP FITS

Slip fits shall be assembled using wet TT-P-1757, MIL-P-23377 or MIL-P-85582 epoxy primers.

3.7.9 PRESS FITS

The pressing shall be accomplished using wet TT-P-1757, MIL-P-23377 or MIL-P-85582 Epoxy Primers. Pressing of bushings into landing gear assemblies shall be accomplished with wet FMS-3055 sealant. (The last sentence does not apply to USAF F-16A 1 through 6 and F-16B 1 and 2).

3.7.10 WELDING, BRAZING, AND SOLDERING

Welding, brazing or soldering shall not be permitted on an assembly after it has been inspected and accepted.

3.7.11 FUNCTIONAL SURFACES

Special care shall be exercised to insure that paint is not applied to working surfaces, to adjustable screw threads, or to oil holes. Paint shall not be applied to fittings in a manner that will cause malfunctioning. Drain holes shall not be plugged by excessive or improper application of paint or sealant.

3.7.12 PARTS HOUSED IN OR PERMANENTLY COATED WITH OIL OR GREASE

Paint coatings shall not be applied to those parts which are permanently coated with or housed in lubricating oil, hydraulic oil, or grease.

3.7.13 ADJUSTABLE PARTS

Threads of adjustable parts, such as tie rods, turnbuckles, etc., shall be lubricated and protected both before and after assembly with anti-seize compound conforming to Specification MIL-T-5544 or an equivalent material, or protected with corrosion-preventive compound conforming to Specification MIL-C-16173.

3.7.14 TOUCHUP

All components shall be touched up after installation in accordance with the general airplane schedule. Topcoats shall be applied over primer to match the color of adjacent exterior surfaces. The purpose of touchup is to improve aesthetics and restore corrosion protection to small areas where corrosion protection has been removed. Removal of metal after initial finishing shall require restoration of the finish per paragraphs 3.7.14.1 through 3.7.14.4.

a. Touchup/painting of individual components in a temperature and humidity controlled (indoor) environment may be delayed until touchup of the assembly.

b. Touchup/painting of small interior and exterior areas, including previously primed doors, panels, and replaceable items may be accomplished in an uncontrolled (outdoors, flight line, etc.) environment. For all sanded areas and other areas where corrosion protection is removed for touchup, the finish must be reapplied within four (4) hours.

c. Touchup on interior/exterior areas may be accomplished using FMS-1058-1 as an alternate to MIL-P-85582, MIL-P-23377 or FMS-3027 Epoxy Primers.

3.7.14.1 Aluminum Alloy Details or Assemblies – Non-Fuel Areas

a. Trimmed edges of panels, spot faces recesses or subsequent machined surfaces shall receive brush chemical film treatment per MIL-C-5541 followed by two coats of FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer or (one coat of FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer) and two coats of urethane coating per MIL-C-83286 or MIL-C-85285 or two coats of acrylic lacquer per MIL-L-81352 (where permitted) of the required color or one coat of MIL-C-22750 Epoxy Coating of the required color depending on location.

3.7.14.2 Aluminum Alloy Details or Assemblies – Within Fuel Boundary

a. Treated areas shall receive the MIL-C-27725 Fuel tank coating per FPS-1004 or FMS-3014, Form 2, Primer per FPS-3035.

3.7.14.3 Aluminum Alloy Details or Assemblies – Exterior Surfaces of the Airframe Requiring Aerodynamic Smoothing

a. Apply FMS-1044 to the butt joints of adjacent details or assemblies per FPS-1003 or FPS-1004 as applicable.

3.7.14.4 Touchup of Fasteners

a. Restoration of the chemical treatment is not required for removal of metal for holes for permanently installed fasteners drilled in parts at the assembly level when the fastener is to be installed with corrosion preventative primer or sealant.

b. Accessible ends of permanently installed fasteners shall be coated (brush coating is acceptable) with one mist coat of FMS-1058-1 Primer and one coat of FMS-3035 Flexible Primer. In color areas, the fastener head, and the surrounding area as needed, shall be touched up to match the specified color.

c. For permanently installed steel fasteners where the protective finish was removed, and where restoration of original finish is not practicable (i.e., stems of blind bolts, shaved

heads, etc.), all unprotected surfaces shall be coated with one mist coat of FMS-1058-1 Primer and one coat of FMS-3035 Flexible Primer (brush coating is acceptable).

d. Nuts and heads of bolts in joints that are subsequently lubricated need not be touched up.

3.7.15 ATTACHMENT OF NAMEPLATES

The attaching surfaces of the component shall have received the primer and painted finish prior to the attachment of nameplates, instruction plates, and other designation plates.

All metal nameplates, attaching bands, and other designation plates which are attached to the component, other than by adhesive bond, shall have two coats of epoxy primer applied to the back of the name plate. After attachment to the component, the face of the metal plates, except those in fuel areas, shall be overcoated with clear acrylic lacquer in accordance with MIL-L-19537.

3.7.16 USE OF MERCURY

Due to the corrosive effects of mercury on aircraft parts, mercury shall not be used on any aircraft parts (or as an anti-fungus agent in fungus resistant materials) without specific approval of the procuring agency.

3.7.16.1 Caution - Mercury containing devices shall not be used on aircraft installed equipment or during production where spillage can contact metals.

3.7.17 CLEANING OF CHEMICAL FILM TREATED (MIL-C-5541) AND ANODIZED SURFACES (MIL-A-8625 TYPE I AND TYPE II – DUPLEX SEALED) OR SURFACES TREATED WITH MIL-C-83488 COATING PRIOR TO PAINTING

Prior to application of any paint coating as specified herein, all surfaces will be wiped with clean cheese-cloth moistened with MIL-C-38736 or P-6174 cleaner or MIL-T-14757 or P6228-1 or P6230-1 or FMS-2004 and allow to air dry. Parts which are not contaminated after metal treatment do not require recleaning.

3.7.18 CLEANING OF CURED PRIMER SURFACES PRIOR TO FINAL FINISH

(Primer has been air cured longer than 24 hours at room temperature or has been oven cured).

a. Scuff sand, using 320 grit wet-or-dry sand paper or equivalent, to remove surface gloss.

b. Wipe surfaces with clean cheesecloth moistened with MIL-C-38736 or P-6174 cleaner or MIL-T-14757 or P6228-1 or P6230-1 or FMS-2004.

c. Apply a thin coat of FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer or FMS-3035 Flexible Primer prior to application of final finish.

3.7.19 CLEANING AND FINISHING OF AIRCRAFT EXTERIOR AFTER FINAL ASSEMBLY

Final finishing of the aircraft exterior shall be completed per paragraphs 3.7.19.1 through 3.7.19.4. At the option of the Contractor, final finishing may be completed after conditional acceptance of the aircraft, provided all unfinished surfaces are protected.

a. When flying the aircraft before final finishing, the following must be accomplished before first flight.

(1) Apply mist coat of FMS-1058-1 to all unfinished fasteners and designed areas where contamination or moisture may penetrate (brush application is acceptable). Allow to dry.

(2) Apply markings required for flight using strippable paint per FMS-1047.

b. When flying aircraft before final finishing, the exterior exposed surfaces shall be scuff sanded before final finishing.

3.7.19.1 Aluminum Exterior Surfaces

a. Alkaline clean, then rinse with tap water.

b. Inspect for water film break. If break occurs, reclean.

c. While wet, spray with MIL-C-81706 chem film per MIL-C-5541. Allow 1-3 minutes for reaction. Rinse with tap water, followed by a deionized water rinse.

d. Force dry using 125ºF circulating dry hot air for 4 hours to remove all moisture from fastener recesses, seams and joints.

e. Allow the airplane to cool to room temperature.

f. Apply one mist coat of FMS-1058-1 Sealant Primer to fastener rows and allow to dry not less than 30 minutes or more than 4 hours.

g. Apply one coat of flexible primer per FMS-3035 to the entire exterior surface and allow to dry for not less than 4 hours (2 hours when using accelerator) nor more than 72 hours.

NOTE: For dry times in excess of 48 hours, a tack rag wipe of prime surface is required prior to topcoat application

h. Within a time span of not less than one hour and not more than eight hours, apply two coats of MIL-C-83286 or MIL-C-85285 or FMS-2026 coating.

i. Allow the coating to cure per the following minimum times at the following temperature ranges. Temperature excursions below the designated temperature range may be compensated by additional cure time.

MIL-C-83286	60ºF to 100ºF for 15 hours 101ºF to 140ºF for 5 hours
MIL-C-85285	60ºF to 100ºF for 15 hours 101ºF to 140ºF for 5 hours
FMS-2026	60ºF to 100ºF for 8 hours 101ºF to 140ºF for 4 hours

NOTE: Temperature excursions totaling more than 15 minutes above 141°F are not allowed.

3.7.19.2 Corrosion Resistant Steel or Titanium

a. Corrosion-Resistant Steel (Excluding Stabilizer Leading Edges).

(1) Wipe surfaces with clean cheesecloth moistened with MIL-C-38736 cleaner or MIL-T-14757 or P6228-1 or P6230-1 or FMS-2004 and wipe dry.

(2) Lightly sand exposed surfaces using 280 or finer wet-or-dry sandpaper.

(3) Wipe surfaces with clean cheesecloth moistened with MIL-C-38736 cleaner or MIL-T-14757 or P6228-1 or P6230-1 or FMS-2004.

(4) Apply one thin coat of MIL-C-8514 wash primer and allow to dry not less than 30 minutes or more than 4 hours before application of subsequent finish.

(5) Apply one mist coat of FMS-1058-1 Sealant Primer to fastener rows and allow to dry not less than 30 minutes or more than 4 hours.

(6) Apply one coat of flexible primer per FMS-3035 to the entire exterior surface and allow to dry for not less than 4 hours (2 hours when using accelerator) nor for more than 72 hours.

NOTE: For dry times in excess of 48 hours a tack rag wipe of prime surface is required prior to topcoat application.

(7) Apply two coats of MIL-C-83286 or MIL-C-85285 or FMS-2026 coating.

(8) Allow the coating to cure per the following minimum times at the following temperature ranges. Temperature excursions below the designated temperature range may be compensated by additional cure time.

MIL-C-83286	60ºF to 100ºF for 15 hours 101ºF to 140ºF for 5 hours
MIL-C-85285	60ºF to 100ºF for 15 hours 101ºF to 140ºF for 5 hours
FMS-2026	60ºF to 100ºF for 8 hours 101ºF to 140ºF for 4 hours

NOTE: Temperature excursions totaling more than 15 minutes above 141°F are not allowed.

b. Titanium

(1) Wipe surfaces with clean cheesecloth moistened with MIL-C-38736 cleaner or MIL-T-14757 or P6228-1 or P6230-1 or FMS-2004 and wipe dry.

(2) Apply brush chemical film conversion coating, MIL-C-81706 Class 1A, per MIL-C-5541. Rinse with deionized water and wipe dry.

(3) Apply one mist coat of FMS-1058-1 Sealant Primer to fastener rows and allow to dry not less than 30 minutes or more than 4 hours.

(4) Apply one coat of flexible primer per FMS-3035 to the entire exterior surface and allow to dry for not less than 4 hours (2 hours when using accelerator) nor more than 72 hours.

NOTE: For dry times in excess of 48 hours, a tack rag wipe of prime surface is required prior to topcoat application.

(5) Apply two coats of MIL-C-83286 or MIL-C-85285 or FMS-2026 coating.

(6) Allow the coating to cure per the following minimum times at the following temperature ranges. Temperature excursions below the designated temperature range may be compensated by additional cure time.

MIL-C-83286 60ºF to 100ºF for 15 hours
101ºF to 140ºF for 5 hours

MIL-C-85285 60ºF to 100ºF for 15 hours
101ºF to 140ºF for 5 hours

FMS-2026 60ºF to 100ºF for 8 hours
101ºF to 140ºF for 4 hours

NOTE: Temperature excursions totaling more than 15 minutes above 141°F are not allowed.

c. Corrosion-Resistant Steel (excluding Stabilizer Leading Edges) or Titanium

(1) Apply one mist coat of FMS-1058-1 Sealant Primer to fastener rows and allow to dry not less than 30 minutes or more than 4 hours.

(2) Apply one coat of flexible primer per FMS-3035 to the entire exterior surface and allow to dry for not less than 4 hours (2 hours when using accelerator) nor more than 72 hours.

NOTE: For dry times in excess of 48 hours, a tack rag wipe of prime surface is required prior to topcoat application.

(3) Within a span of not less than one hour or not more than eight hours after priming, apply two coats of MIL-C-83286 or MIL-C-85285 Urethane or FMS-2026 coating.

(4) Allow the coating to cure per the following minimum times at the following temperature ranges. Temperature excursions below the designated temperature range may be compensated by additional cure time.

MIL-C-83286 60ºF to 100ºF for 15 hours
101ºF to 140ºF for 5 hours

MIL-C-85285 60ºF to 100ºF for 15 hours
101ºF to 140ºF for 5 hours

FMS-2026 60ºF to 100ºF for 8 hours
101ºF to 140ºF for 4 hours

NOTE: Temperature excursions totaling more than 15 minutes above 141°F are not allowed.

d. Corrosion-Resistant Steel (Stabilizer Leading Edges)

(1) Wipe surfaces with clean cheese cloth moistened with MIL-C-38736 cleaner or MIL-T-14757 or P6228-1 or P6230-1 or FMS-2004 and wipe dry.

(2) Lightly sand exposed surfaces using 240 grit or finer wet-or-dry sandpaper.

(3) Wipe surfaces with clean cheesecloth moistened with MIL-C-38736 cleaner or MIL-T-14757 or P6228-1 or P6230-1 or FMS-2004.

(4) Apply one coat of FMS-1058-1 Primer and allow to dry not less than 30 minutes or more than 4 hours.

(5) Apply one coat of flexible primer per FMS-3035 to the entire exterior surface and allow to dry for not less than 4 hours (2 hours when using accelerator) nor more than 72 hours.

NOTE: For dry times in excess of 48 hours a tack rag wipe of prime surface is required prior to topcoat application.

(6) Apply rain erosion protection to leading edges as specified per 3.3.5.

3.7.19.3 Graphite Epoxy Composites

a. If the peel ply of the laminate has been removed:

(1) Wipe the exposed surface with clean cheesecloth moistened with MIL-C-38736 or P6174 cleaner or MIL-T-14757 or P6228-1 or P6230-1 or FMS-2004 and wipe dry.

(2) Lightly sand the surface with 320 grit wet-or-dry sand paper.

(3) Remove the sanding dust with a tack rag.

(4) Apply one mist coat of FMS-1058-1 Sealant Primer to fastener rows and allow to dry not less than 30 minutes or more than 4 hours.

(5) Apply one coat of flexible primer per FMS-3035 to the entire exterior surface and allow to dry for not less than 4 hours (2 hours when using accelerator) nor more than 72 hours.

NOTE: For dry times in excess of 48 hours, a tack rag wipe of prime surface is required prior to topcoat application.

(6) Within a time span of not less than one hour or more than eight hours, apply two coats of MIL-C-83286 or MIL-C-85285 or FMS-2026 coating.

(7) Allow the coating to cure per the following minimum times at the following temperature ranges. Temperature excursions below the designated temperature range may be compensated by additional cure time.

MIL-C-83286	60ºF to 100ºF for 15 hours 101ºF to 140ºF for 5 hours
MIL-C-85285	60ºF to 100ºF for 15 hours 101ºF to 140ºF for 5 hours
FMS-2026	60ºF to 100ºF for 8 hours 101ºF to 140ºF for 4 hours

NOTE: Temperature excursions totaling more than 15 minutes above 141ºF are not allowed.

b. If the peel ply has not been removed:

(1) Carefully remove the peel ply from the laminate taking care not to contaminate the surface.

(2) Apply the primer and urethane coating as per (4), (5), and (6) above.

3.7.19.4 Glass Reinforced Plastics

a. Wipe the exposed surfaces with clean cheesecloth moistened with MIL-C-38736 or P-6174 cleaner or MIL-T-14757 or P6228-1 or P6230-1 or FMS-2004 and wipe dry.

b. Lightly sand the surface with 320-grit wet-or-dry sand paper.

c. Wipe the sanded surfaces with clean cheesecloth moistened with MIL-C-38736 or P-6174 cleaner or MIL-T-14757 or P6228-1 or P6230-1 or FMS-2004 and wipe dry.

d. Wipe cleaned surface with a clean tack rag.

e. Apply one mist coat of FMS-1058-1 Sealant Primer to fastener rows and allow to dry not less than 30 minutes or more than 4 hours.

f. Apply one coat of flexible primer per FMS-3035 to the entire exterior surface and allow to dry for not less than 4 hours (2 hours when using accelerator) nor for more than 72 hours.

NOTE: For dry times in excess of 48 hours, a tack rag wipe of prime surface is required prior to topcoat application.

g. Within a time span of not less than one hour or more than eight hours, apply two coats of MIL-C-83286 or MIL-C-85285, or FMS-2026 coating.

h. Allow the coating to cure per the following minimum times at the following temperature ranges. Temperature excursions below the designated temperature range may be compensated by additional cure time.

MIL-C-83286	60ºF to 100ºF for 15 hours 101ºF to 140ºF for 5 hours
MIL-C-85285	60ºF to 100ºF for 15 hours 101ºF to 140ºF for 5 hours
FMS-2026	60ºF to 100ºF for 8 hours 101ºF to 140ºF for 4 hours

NOTE: Temperature excursions totaling more than 15 minutes above 141ºF are not allowed.

3.7.20 INSPECTION CRITERIA FOR AIRCRAFT FOLLOWING FINAL FINISHING

Final finishing of the aircraft is provided for aesthetic appearance, camouflage, and to meet Engineering requirements for corrosion resistance. Inspection requirements for aesthetic appearance are intended as finishing workmanship guidelines only.

3.7.20.1 Workmanship of Exterior Surfaces - Should workmanship resulting in surface roughness become an issue of product acceptability, FPS-3009 shall be used as the acceptance standard.

3.7.20.1.1 In addition to the normal Class 2 authorization, all changes to the F-16 Prime and Topcoat Application specification (FPS-3009) shall require prior written approval by the F-16 Corrosion Prevention and Control Team.

3.7.20.2 Coating Thickness of Exterior Surfaces - The coating thickness of the exterior surfaces after final finishing shall be in accordance with paragraph 1.8.1.

a. A total coating thickness of 0.0005 inch over maximum or under the minimum coating thickness specified in paragraph 1.8.1 shall be allowed in a maximum of 10 percent of the thickness readings.

b. For an apparently discrepant area, the average reading of a one square foot area centered on the discrepant area, shall be a single reading.

3.7.20.3 Overspray into Inaccessible Areas - Overspray of the exterior colors into unmasked interior areas through door or panel seams is unavoidable in some areas and will not be cause for rejection.

3.7.20.4 Deleted

3.7.20.5 Color Mismatch in Touchup Areas - Good workmanship requires a consistent exterior color, but slight color mismatch between touchup areas and surrounding areas is unavoidable. Touchup and surrounding areas must match specified FED-STD-595 color schemes.

3.8 PRECAUTIONS.

3.8.1 CLEANING

Abrasives which accelerate corrosion shall not be used.

3.9 DEVIATIONS

The following authorized deviations are incorporated into this specification:

3.9.1 MIL-T-10727 TIN PLATING

Deviation – LM Aero and its subcontractors shall use Fort Worth Division Specification FPS-0030 for electrodeposited tin on ferrous metals in lieu of MIL-T-10727, “Tin Plating, Electrodeposited or Hot Dipped for Ferrous or Non-ferrous Metals.”

Reason – LM Aero Specification requires the electrodeposited tin on ferrous metal to meet specification MIL-T-10727 plus the additional requirements as follows:

a. Requirements are established for handling and treatment of metals with a heat treatment in excess of 200,000 psi.

b. Requirements are established for specific thicknesses of plating.

c. For parts heat treated to RC 40 hardness or higher, requirements are established for stress relief before plating and for hydrogen embrittlement relief after plating.

d. Cleaning requirements prior to plating are established.

e. Requirements are established for the electroplater’s responsibility during the period parts are under his control.

3.9.2 MIL-C-5541 CHEMICAL CONVERSION COATING ON ALUMINUM AND ALUMINUM ALLOYS

Deviation – LM Aero and its subcontractors shall use the following quality assurance provisions for chemical conversion coatings per MIL-C-5541 in lieu of those given in paragraphs 4.3 through 4.5 of MIL-C-5541.

3.9.2.1 Deviation #1 - Qualification

a. The process, solutions, and equipment used shall be demonstrated capable of producing coatings conforming to MIL-C-5541. The test panels used for qualification shall be the same as those specified for periodic controls.

b. The process, including solution descriptions and solution controls, used in qualification shall be documented.

3.9.2.2 Deviation #2 - Periodic controls

a. One each 30 days corrosion resistance testing shall be performed following procedures prescribed by MIL-C-5541 on five 2024-T3 or 7075-T6 or 6061-T6, as applicable, 3” x 10” x 0.040” panels.

b. Once each 30 days a paint adhesion test shall be run on a 2024-T3 or 7075-T6 or 6061-T6, as applicable, 3” x 10” x 0.040” panel which has been chemical film treated per MIL-C-5541 then primed with a 0.0006 to 0.0009 inch coating of FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer.

   Allow the primer to air dry at least 24 hours before conducting tests. Paint adhesion testing shall consist of knife test and tape test as described in MIL-C-5541.

c. Deleted

d. Each production load shall be visually inspected. There shall be no bare areas other than those caused by clamp points or basket supports. The color shall be light iridescent gold to tan.

   (1) Light areas or streaks caused by shielding or contact with adjacent parts shall not be cause for rejection provided such areas are small in proportion to the total area and are not over 1/8 inch in width.

   (2) Visible powdering of chemical filmed surfaces shall be cause for rejection except that, on castings, some powdering is normal and shall not be cause for rejection.

   (3) Visible mill lettering shall not be cause for rejection.

   (4) Dark discoloration in weld areas shall not be cause for rejection.

Reason – The Quality Assurance provisions of MIL-C-5541 cause undue delay in manufacturing of production parts.

3.9.3 MIL-A-8625 ANODIC COATINGS FOR ALUMINUM AND ALUMINUM ALLOYS

Deviations – LM Aero and its subcontractors shall use the following Quality Assurance provisions for anodic coatings in lieu of those given in paragraphs 4.2 through 4.6 of MIL-A-8625.

3.9.3.1 Deviation #1 - Qualification

a. The process, solutions, and equipment used shall be demonstrated capable of producing coatings conforming to MIL-A-8625. Test panels used for Qualification shall be the same as those specified for periodic controls.

b. The process, including solution descriptions and solution controls, used in qualification shall be documented. Changes in solution controls, solutions, or equipment will necessitate requalification.

c. A paint adhesion test shall be run on a 2024-T3 3” x 10” x 0.040” panel which has been anodized per MIL-A-8625, Type I or II, and then primed with a 0.0004 to 0.0007 inch coat of FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer. Allow the primer to air dry two hours minimum, but not more than four hours. Apply two coats of MIL-C-83286 (0.0008-0.0012 inch dry film thickness per coat) or MIL-C-85285 (0.0016-0.0040 inch total dry film thickness), Type I Topcoat. Air dry for 72 hours. Paint adhesion test shall be as described in MIL-F-18264, paragraph 8.5, except only a failure between prime and anodic coating shall be cause for rejection of anodic process.

3.9.3.2 Deviation #2 - Periodic controls for MIL-A-8625, Types I and II

a. Once each 30 days corrosion resistance test, following the procedures specified in MIL-A-8625, shall be performed on five bare 2024-T3 3” x 10” x 0.040” test panels which will represent all aluminum alloys except overaged 7000 series or on five bare 7075-T73 or 7475-T73, 3” x 10” x 0.040” test panels which will represent overaged 7000 series aluminum alloys which are anodized alone or with mixed loads containing other aluminum alloys.

b. Once each 30 days a coating weight determination shall be made following MIL-A-8625 procedures on a bare 2024-T3, 4” x 4” x 0.040” test panel which will represent all aluminum alloys except overaged 7000 series or on a bare 7075-T73 or 7475-T73 4” x 4” x 0.040” test panel which will represent overaged 7000 series aluminum alloys that are anodized alone or with mixed loads containing other aluminum alloys.

c. Coating weight tests shall be performed following MIL-A-8625 procedures except that a multi-level continuous sampling plan may be used. The sampling plan shall conform to H-106, F 1/3-type plans, for an AOQL of 5 percent. The test panel shall be bare 2024-T3 4” x 4” x 0.040” which will represent all aluminum alloys except overaged 7000 series or on a bare 7075-T73 or 7475-T73 4” x 4” x 0.040” test panel which will represent overaged 7000 series aluminum alloys which are anodized alone or with mixed loads containing other aluminum alloys.

3.9.3.3 Deviation #3 - Periodic Controls for MIL-A-8625, Type III

a Abrasion resistance tests shall be made following MIL-A-8625 procedures except that a multi-level continuous sampling plan may be used. The sampling plan shall conform to H-106 F 1/3-type plans for an AOQL of 5 percent. The test panels shall be a 4” x 4” x 0.040” bare 2024-T3 or 7075-T6 or 6061-T6 as applicable.

b Once each 30 days a coating weight or thickness and an abrasion resistance determination shall be made following MIL-A-8625 procedures on a 4” x 4” x 0.040” 2024-T3 or 7075-T6 or 6061-T6, as applicable, panel.

Reason – The Quality Assurance provisions of MIL-A-8625 cause undue delay in manufacturing of production parts.

3.9.4 MIL-F-18264 FINISHES, ORGANIC, AIRCRAFT, APPLICATION AND CONTROL OF

3.9.4.1 Deviation #1

LM Aero and its subcontractors shall use the following quality assurance provisions for adhesion testing of exterior finish per MIL-F-18264 in lieu of that given in paragraph 8.5 of MIL-F-18264.

a. Dry tape tests shall be conducted on the completed aircraft to assure overall paint adhesion. A minimum of three tests along each side and upper surface of the fuselage, on the upper and lower surfaces of each wing and each horizontal stabilizer, and on each side of the vertical fin and rudder will be conducted.

b. Along with each airplane two 12” x 24” x 0.040” bare 2024-T3 aluminum alloy test panels, one being chromic acid anodized per MIL-A-8625, Type I and the other brush chemical film treated per MIL-C-5541 Class 1A and each given one coat of FMS-3027 or MIL-P-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer shall accompany each airplane being painted. These panels shall receive, in progressive sequence, each operation that the airplane receives. Wet tape testing shall be performed on the test panels after the final topcoat has fully cured.

c. Wet tape tests shall be conducted on the completed aircraft on a sampling plan basis. The sampling shall be done per Federal Handbook H-106 procedures with the following parameters: AOQL = 5.0, f = ½ and k = 3. The wet tape tests are to be conducted on the forward fuselage, center fuselage, aft fuselage, wing upper surface and wing leading edge.

Reason – Quality Assurance for adhesion of exterior coating per MIL-F-18264 requires wet tape testing of every aircraft prior to delivery. Wet tape testing on a sampling plan basis along with the dry tape testing and wet tape testing of witness panels for every aircraft will provide sufficient evidence of proper cleaning/painting procedures at contractor's facilities.

3.9.4.2 Deviation #2

LM Aero and its subcontractors shall use the following Quality Assurance provisions for adhesion testing of interior finish per MIL-F-18264 in lieu of that given in paragraph 8.5 of MIL-F-18264.

a. At least once in the first half and at least once in the second half of each shift, at least 4 parts (or assemblies) shall be selected at random from production output during the period represented and dry tape tested for acceptable adhesion.

b. Twice each week, a part (or assembly) shall be selected at random from production and wet tape tested for acceptable adhesion. Scratch testing shall not be included.

NOTE: It is acceptable to perform the wet tape adhesion test on a control test panel in lieu of an actual production part or assembly. The control test panel shall be of the same alloy, pretreatment, final finish and be processed in the same manufacturing cycle as the production part it represents. The control specimen shall be 3 x 6 x 0.040 inch minimum.

Reason – To avoid production delays caused by refinishing scratch test parts.

3.9.4.3 Deviation #3

LM Aero and its subcontractors will conduct, at their option, aircraft test flights after application of the exterior primer coat(s) but before final finishing. This procedure is a deviation from paragraph 13.4 of MIL-F-18264 which states that "Test flying on primers or intermediate states of the complete finish scheme is prohibited."

Reason – Excessive touchup is required to make the exterior coating aesthetically appealing for final inspection. This will also prevent damage to the final finish, and excessive paint thickness due to touchup. The exterior will be adequately protected from moisture and dirt contamination during test flights by preparation per paragraph 3.7.19 of this document before test flights.

3.9.5 QQ-P-416 CADMIUM PLATE

Deviation – Where QQ-P-416, Class 2, Type II is specified, fastener hardware shall receive Class 2 thickness on the shank and head with full visual coverage on the threads.

Reason – QQ-P-416 specifies 0.0002-inch minimum on the threads. Thickness on threads is difficult to measure and, when a specified minimum is held on the bottom by threads, too thick plating is applied to the shank and outer portion of threads.

3.9.6 METAL PLATING SPECIFICATIONS – ADHESION BEND SPECIMENS

QQ-P-416	Cadmium Plating, Electrodeposited
FPS-1007	Cadmium Plating, Electrodeposited
QQ-C-320	Chromium Plating, Electrodeposited
MIL-T-10727	Tin Plating, Electrodeposited
FPS-0030	Tin Plating, Electrodeposited
QQ-N-290	Nickel Plating, Electrodeposited
QQ-S-365	Silver Plating, Electrodeposited

MIL-C-8837	Cadmium Plating – Vacuum Deposited
MIL-C-26074	Nickel Plating, Electroless

Deviation – Four adhesion control coupons shall be electroplated along with each production load. Coupons shall be approximately 1" x 4" x 0.040" in size. Use 4130 steel specimens to represent all low alloy steels and use 300 series steel specimens to represent all corrosion-resistant steels. The specimens need not be heat treated although heat treat specimens are acceptable. Introduce the specimens just prior to the initial cleaning step (usually grit blast). The plated specimens shall be clamped in a vise or bending jig and bent through 180º until broken. If the edge of the ruptured plating can be peeled back or if separation between the plating and the basis metal can be seen at the point of rupture when examined at four diameters of magnification, adhesion is not satisfactory and the load represented shall be rejected.

Reason – Federal, Military and LM Aero specifications on platings require specimens of material not generally available except in large quantities or on special order.

3.9.7 QQ-P-35 – PASSIVATION OF CORROSION-RESISTANT STEELS

a. Close tolerance parts and threaded parts for applications where double dimensioning is not practical shall be passivated per FPS-3007 or QQ-P-35. Such parts are not required to be subjected to salt spray or humidity tests.

b. Parts fabricated from 300 series or PH13-8Mo CRES, where double dimensioning is practical, shall be passivated per FPS-3020. This process removes approximately 0.00075-inch metal per surface.

c. Parts fabricated from 15-7 PH or 17-7 PH shall be passivated per FPS-3020. This process removes approximately 0.00075-inch metal per surface.

3.9.8 MIL-F-7179 FINISHES AND COATINGS, PROTECTION OF AEROSPACE WEAPON SYSTEMS, STRUCTURES AND PARTS, GENERAL SPECIFICATION FOR

3.9.8.1 Deviation #1

LM Aero and its subcontractors shall use the following procedures for finishing the exterior of specified tubing in lieu of those given in paragraphs 4.3 and 5.9.1 or MIL-F-7179.

a. Application of chemical film per MIL-C-5541 or anodize per MIL-A-8625, as required by 3.1.1 herein, to the exterior of 5052 and 6061 aluminum alloy tubing ½ inch O.D. and less, may be accomplished prior to forming.

Reason – No corrosion problems encountered on prior aircraft program using this procedure which is more compatible with an automated production program.

3.9.8.2 Deviation #2

The exterior faying surface sealing requirements of MIL-F-7179 paragraph 3.6.4 and paragraphs 3.3.2 and 3.7.1 herein shall be optional for the interface between the Canopy Fairing and Cover. This is between parts 16K0511 and 16K0512/16K0513 on F-16A/C models, and between parts 16K2551 and 16K0512/16K2513/16K2514 on F-16B/D models.

Reason – SPO direction per YPC log 10878, dated 8 March 1993, and PCOL 93-0192-086-YPK, dated 12 March 1993.

3.9.9 MIL-S-5002 SURFACE TREATMENTS AND INORGANIC COATINGS FOR METAL SURFACES OF WEAPON SYSTEMS

Deviation – LM Aero and its subcontractors shall use the following procedures for passivation of specified steel tubing in lieu of those given in paragraph 3.4.2.4.1 of MIL-S-5002.

a. Passivation after forming of tubes of 300 series CRES, precipitation-hardening CRES, and 21-6-9 CRES shall not be required provided passivation was accomplished prior to forming and after any welding was performed.

Reason – No corrosion problems encountered on prior aircraft using this procedure which is more compatible with an automated production program.

3.9.10 USE OF ONE PART EPOXY COATING

Deviation – Lear-Siegler, Inc., shall be allowed to use a one-part epoxy finish (SM 10152) on the Flight Control Computer (16VC003 and 16VC030) and the Stick Force Sensor (16VC010) and on related parts in lieu of the standard finish of one coat of FMS-3027 or MIL-C-23377 Epoxy Primer or MIL-P-85582 Voc Compliant Epoxy Primer and two coats of MIL-C-83286 or MIL-C-85285 Urethane paint or two coats of MIL-C-22750 Epoxy Enamel paint as specified in this document.

Reason – The finish has been used as standard finish on similar parts for other aircraft programs with good results. In addition, the finish has been fully evaluated by GD/FW and found to be acceptable. The test data is included in GD/FW Process Control Investigation Report No. 1179 and Lear-Siegler letter No. BA 83-009R1.

3.9.11 USE OF BLACK SULFURIC ACID ANODIZE ON ALUMINUM CASTINGS

Deviation – Garret/AiResearch Corp. shall be allowed to use black sulfuric acid anodize per MIL-A-8625, Type II on aluminum (cast, bar, plate, etc.) parts for the following components:

16VY004	Variable pressure regulator and shutoff valve
16VY017	13th stage bleed air regulator and shutoff valve
16VY102001	Hot air control valve
16VY102002	Hot air sensor/controller
16VY103001	Cabin temperature control valve
16VY111	Servo air pressure regulator
C7876	Thermostat
C9699	Aneroid Valve

Reason – This finish has been used as a standard finish on similar parts for other aircraft programs with good results. In addition, this finish has been fully tested by GD/FW and found to be acceptable. The test data is included in Materials and Processes Data Memorandum No. 500, dated 12 April 1984.

3.9.12 MIL-STD-889A DISSIMILAR METALS

3.9.12.1 Deviation #1 – LM Aero and its subcontractors shall be allowed to use cadmium plated fasteners in contact with titanium parts in the following installations:

16B4215	Frame, Duct – NLG, FS203.35
16B6312	Shield Instl, Heat – Internal, FS446.10 to FS479.55
16B6319	Skin Instl – Lower, FS462.82 to FS494.00
16B6324	Skin Instl, Lower, FS446.10 to FS462.82
16B6823	Cap, Support Beam – Horizontal Tail, Inboard, Lower

Reason – Investigation, including discussion with the Air Force Materials Lab and the F-16 SPO, indicates that there is no problem due to low operating stresses and temperatures in the applications.

3.9.12.2 Deviation #2 – LM Aero and its subcontractors shall be allowed to use silver-filled paints, silver-plated copper filled elastomers (gaskets), and conductive adhesive in contact with aluminum structure for the following parts and installations when used on aircraft containing a high frequency radio within Dorsal Bay 7.

16B6239 Bulkhead

16T2091 Bulkhead

16B6169 Bracket (Longeron)

16T2093 Cowl - Assembly Of

16T2092 Cover Assembly

16T2090 Dorsal Installation

Reason – Certain aircraft subsystems require enhanced shielding for electromagnetic interference to meet the subsystem's performance requirements. (Reference memo from Mike McSpadden to Distribution dated 10 September 2008, subject PD-173 for Dorsal Cover Corrosion.)

3.9.13 USE OF CORICONE CORROSION PREVENTION COMPOUND

Deviation – Smiths Inc. shall be allowed to use Coricone corrosion prevention compound over chemical film on the interior surfaces of the 16VF050001-6/7 Signal Acquisition Unit (SAU).

Reason – GD/FW tested the Coricone material and has found it to be capable of withstanding 500 hours salt spray exposure. This material will supplement the chemical film on the interior of the SAU to improve corrosion resistance.

3.9.14 USE OF ALTERNATE FINISH ON ELECTRONIC UNIT

Deviation – Smiths Inc. shall be allowed to apply the following finish to the 16VF050002 Crash Survivable Memory Unit (CSMU) in lieu of the finish specified in 3.6.13.3.

a. Armored housing

(1) Cadmium plate per QQ-P-416, Type II, Class 2, or coat with IVD aluminum coating per MIL-C-83488 whether part is made from T-250 steel, 17-4, 15-5 or 13-8 CRES, or Inconel.

(2) Prime with MIL-P-23377 or MIL-P-85582 primer.

(3) Apply one coat of white MIL-C-83286 Urethane paint.

(4) Apply one coat of fluorescent orange MIL-C-83286 paint, Color No. 38903 (as provided by Deft Corp.).

(5) Apply one coat of clear gloss MIL-C-83286 coating.

b. Electronics cover

(1) Chem film – Coricone may be applied over exposed areas as an added protection.

(2) Prime with MIL-P-23377 or MIL-P-85582 primer.

(3) Apply one coat of white MIL-C-83286 Urethane paint

(4) Apply one coat of fluorescent orange MIL-C-83286 paint, Color No. 38903 (as provided by Deft Corp.)

(5) Apply one coat of clear gloss MIL-C-83286 coating.

Reason – Finish specified in 3.6.13.3 cannot be attained in fluorescent orange color that is required by specification for visibility. Finish system as specified above has been tested and passed by GD/FW for 500 hours exposure to salt spray.

3.9.15 USE OF UNSEALED ANODIZE ON PARTS FROM IPTN

Deviation – Aluminum parts with unsealed anodized coating produced by IPTN from 1 March 1989 to 29 August 1990 shall be considered acceptable for use on the F-16 aircraft. A complete list of the part numbers involved is shown below.

3.9.16 USE OF ALTERNATE FINISH FOR MAGNESIUM ALLOYS

Deviation – Sundstrand Aerospace shall be allowed to apply an alternate magnesium alloy finish to the Constant Speed Drive (CSD) Housing, Generator Housing and Engine Starting System (ESS) Gearbox Housing in lieu of the finish specified in Paragraph 3.4.6. The finish system deviation shall be as follows:

(1) Conversion coat using the phosphate-fluoride process per Sundstrand Aerospace specification PN14.05-01.

(2) Prime with one coat of Sundstrand Aerospace MS37.14 epoxy primer.

(3) Apply one coat of MIL-C-22750 or Sundstrand Aerospace MS37.09-01 or Sundstrand Aerospace MS37.15 epoxy paint.

Reason – Sundstrand Aerospace has submitted test data showing that the above finish system will meet adhesion tests, fluid exposure tests and salt spray exposure (Reference Sundstrand Aerospace Materials and Engineering Department Technical Report No. 2989-10/11/12). This alternate process will meet the paint adhesion and corrosion resistance requirements necessary for magnesium alloys.

3.9.17 USE OF ALTERNATE ALUMINUM FINISH BY GOODRICH CORP. ON BONDED ASSEMBLIES

Deviation – Goodrich shall be allowed to use the following alternate aluminum finish on bonded assemblies:

(1) Phosphoric acid anodize all surfaces per Goodrich specification RPS 17.23.

(2) Apply bond primer conforming to Goodrich specifications RMS 058 Type 4 and RMS 413 Type III, per Goodrich specification RPS 24.05-2 to all surfaces.

(3) External surfaces of the bonded assembly shall be solvent cleaned per 3.1.1 (a) and receive primer and paint per 3.2.2 (b) and (c).

Reason: Goodrich has submitted test data for adhesion, fluid resistance, salt spray exposure, and filiform corrosion on the combination of phosphoric acid anodize and bond primer. Corrosion protection is equivalent to that provided by MIL-C-5541 chemical film and MIL-P-85582, FMS-3027, or MIL-P-85582 primer.

PART NUMBERS OF PARTS PROCESSED BY IPTN WITHOUT SODIUM DICHROMATE SEALING

PART NUMBER	PART NUMBER	PART NUMBER
FUEL PYLON	16S551-101	16B6577-11
16P238-23	16S551-105	16B6577-13
16P238-25	16S551-17	16B6583-A11
16P238-31	16S551-21	16B6584-21
16S1301-11	16S551-27	16B6585-11
16S1301-13	16S551-31	16B6585-13
16S1303-11	16S551-33	16B6585-21
16S1309-7	16S551-39	16B6585-25
16S1309-8	16S551-57	16B6585-31
	16S551-69	16B6585-7
MAIN LANDING GEAR	16S551-73	16B6585-9
DOOR	16S551-87	16B6886-103
16L319-23	16S551-93	16B6886-105
16L319-24	16S551-95	16B6886-107
16L319-29	16S552-15	16B6886-111
16L319-35	16S553-13	16B6886-113
16L319-36	16S553-14	16B6886-117
16L319-37	16S553-15	16B6886-121
16L319-38	16S553-16	16B6886-123
16L319-43	16S553-17	16B6886-125
16L319-44	16S553-7	16B6886-129
16L319-47P	16S553-9	16B6886-133
16L319-48P	16S554-27	16B6886-139
	16S554-29	16B6886-141
WEAPON PYLON	16S554-33	16b6886-143
16D1700-299	16S554-39	16b6886-147
16D1700-57	16S554-45	16B6886-149
16D1700-587	16S554-47	16B6886-151
16D1700-73	16S554-49	16B6886-153
16D1700-795	16S554-55	16B6886-157
16D600-13	16S560-7	16B6886-159
16P1701-7	16S560-9	16B6886-177
16S1701-21		16B6886-179
16S1701-29	ENGINE ACCESS DOOR	16B6886-181
16S1701-31	R/H	16B6886-183
16S1701-33	16B6533-101	16B6886-187
16S1701-34	16B6533-23	16B6886-189
16S1701-43	16B6533-27	16B6886-19
16S1701-9	16B6533-31	16B6886-193
16S1706-11	16B6533-9	16B6886-195
16S1706-7	16B6546-A21	16B6886-197
16S1708-7	16B6573-13	16B6886-199
16S1717-33	16B6573-15	16B6886-201
16S1718-15	16B6573-19	16B6886-203
		16B6886-29

PART NUMBERS OF PARTS PROCESSED BY IPTN WITHOUT SODIUM DICHROMATE SEALING

PART NUMBER	PART NUMBER	PART NUMBER
ENGINE ACCESS	16B6514-31	16P1547-17
16B6886-55	16B6514-35	16P1547-19
16B6886-57	16B6514-39	16P1548-7
16B6886-61	16B6514-41	16P1554-19
16B6886-63	16B6514-43	16P1554-21
16B6886-79	16B6514-47	16P1554-9
16B6886-89	16B6514-79	
16B6886-93	16B6533-39	FLAPERON
16B6886-95	16B6546-21P	16W021-29
16B6886-99	16B6579-15	16W505-11
16B889-19		16W505-13
16B889-23	ENGINE	16W511-9
	16B6579-17	16W512-11
ENGINE ACCESS	16B6579-21	16W512-13
DOOR L/H	16B6579-25	16W512-15
16B6514-11	16B6579-27	16W512-17
16B6514-179	16B889-11	16W512-19
16B6514-181	16H610-169	16W512-21
16B6514-185	16H610-37	16W512-23
16B6514-187	16H610-91	16W512-25
16B6514-189	16P1522-9	16W550-10
16B6514-21	16P1523-11	16W550-9
16B6514-27	16P1541-A9	

Reason – Tests have been conducted to demonstrate that the adhesion properties of the IPTN anodize process have not been diminished. All the parts listed are coated with primer. Because the primer is the most effective corrosion protection, there is no reason to believe that the corrosion protection requirements have been compromised.

4. INSPECTION

4.1 GENERAL

When inspection is conducted at the Contractor's Plant, all inspection and tests shall be conducted by the Contractor under the supervision of the Government.

4.2 INSPECTION TESTS

All coatings and finishes shall be inspected to insure conformance to the requirements of this specification, as shown in detail applicable manufacturing instructions.

4.3 PREVIOUS APPROVAL

Acceptance or approval of material during course of manufacture and release of approved finish schemes shall in no event be construed as a guarantee of the acceptance of the finished product.

4.4 REJECTION AND RETEST

Coating and finishes not conforming to the requirements of this specification shall be rejected. Coatings and finishes may be reworked or replaced to correct the defects, and resubmitted for acceptance. Before resubmitting, full particulars concerning previous rejection and the action taken to correct defects found in the original shall be furnished to the Government Inspector.

5 PREPARATION FOR DELIVERY

Packaging and delivery of parts shall be as specified in the contract or purchase order.

6 NOTES

6.1 MARGINAL INDICIA

A vertical line in the left margin is used to show technical changes from the prior issue of this specification.

6.2 DISTRIBUTION LIST

Contact LM-Aero for additions, deletions and corrections to distribution lists.

7 ACKNOWLEDGMENT

A supplier shall reference this specification number, its revision letter, amendment, and any applicable program supplement in all quotations and when acknowledging purchase orders.

8 NONCONFORMANCE

Product not conforming to this specification or the purchase order is unacceptable.

9 ENVIRONMENTAL HEALTH AND SAFETY

9.1 LM AERO

Chemicals or materials must meet the LM Aero Environment, Safety and Health (ESH) policy regarding formulary ingredients, VOC/HAP content limits and personnel protective equipment (PPE). Details for handling chemicals or materials may be found in Material Safety Data Sheets (MSDS) and AeroCodes (ACs). LM Aero ESH may be contacted for MSDSs, ACs, and requirements for PPE.

9.2 OTHER PROCESSORS

Subcontractors or vendors are responsible for compliance with all applicable regulations for their facilities.