Beech Aircraft Corporation

Wichita, Kansas

SPECIFICATION

SPEC. NO. BS 3618H

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STANDARD FINISH SPECIFICATION

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1. SCOPE

1.1 Purpose.- This specification supplements the finish specifications for the specific models and the Engineering drawings by giving information necessary for the manufacture of the product or its spare parts of too general a nature to appear as a note on the drawing. This specification meets the requirements of Military Specification MIL-S-5002, "Surface Treatments (Except Priming and Painting) for Metal and Metal Parts in Aircraft" and, with the exception of Paragraphs 3.10.8.1 "Surfaces of Similar Metals" and 3.10.8.2 "Surfaces of Dissimilar Metals", it also meets the requirements of Military Specification MIL-F-7179, "Finishes and Coatings; General Specification for Protection of Aircraft and Aircraft Parts", for Classification Type II protection. The Beech Process Standards called out in this specification are the Beech interpretations of the general requirements of the above Military specifications.

1.2 Precedence.- Should any conflict exist between this specification and a specific model finish specification which this specification supplements, the specific model specification shall take precedence. The specific model finish specification may make all or a part of this specification applicable to its specific product.

1.3 Definitions:

1.3.1 Primer.- Material referred to in this specification as "primer" shall be zinc chromate primer, Military Specification MIL-P-6889.

1.3.2 Finishing Material.- Finishing material may be any varnish, lacquer, enamel, or primer listed in Section 2, "Applicable Specifications and Other Publications".

1.3.3 Aluminized Varnish.- Aluminized varnish consists of sixteen ounces TT-A-468 Aluminum-Pigment; Powder and Paste for Paint and one gallon MIL-V-6893 Varnish; Phenol-Formaldehyde Spar. The quantities are based on one gallon of package material before reduction.

2. APPLICABLE SPECIFICATIONS AND OTHER PUBLICATIONS

2.1 Specifications:

2.1.1 Federal:

QQ-P-416	Plating; Cadmium
TT-A-468	Aluminum-Pigment; Powder and Paste for Paint

2.1.2 Air Force - Navy Aeronautical:

AN-C-124	Compound; Soft Film Corrosion-Preventive
AN-P-32	Plating; Zinc
AN-QQ-A-696	Anodic Films; Corrosion Protection for Aluminum Alloys

2.1.3 Military:

MIL-M-3171	Magnesium Alloy; Processes for Corrosion Protection of
MIL-S-5002	Surface Treatments (Except Priming and Painting) for Metal and Metal Parts in Aircraft
MIL-C-6708	Compound; Exterior Surface, Hard Film Corrosion-Preventive

MIL-P-6871	Plating; Chromium
MIL-P-6889	Primer; Zinc Chromate for Aircraft Use
MIL-V-6893	Varnish; Phenol-Formaldehyde Spar
MIL-F-7179	Finishes and Coatings; General Specification for Protection of Aircraft and Aircraft Parts
MIL-C-7853	Compound; Corrosion-Preventive, Aircraft Engine

2.1.4 Beech:

PS 280	Specification for Treatment of Magnesium Before and After Spotwelding
PS 398	Thread Lubricants

2.2 Beech Process Standards:

PS 1003	Cleaning Surfaces Before and After Soft Soldering
PS 1111	Acidizing
PS 1113	Acid Pickle
PS 1114	Copper Pickle
PS 1117	Cleaning Aluminum Alloy Sheet Before and After Brazing
PS 1119	Cleaning Silver Brazed Stainless Steel Joints
PS 1132	Cleaning and Degreasing - Alkaline Hot Dip Method
PS 1133	Removing Identification Paint from Aluminum Alloys
PS 1141	Phosphoric Acid Wash (Dip Method)
PS 1142	Phosphoric Acid Wash (Wash Method)
PS 1143	Preparation of Aluminum and Aluminum Alloys for Spotwelding - Acid Dip Method
PS 1146	Removal of Heat-Treat Oxides and Carbonaceous Matter from Non-Alclad Aluminum Alloys
PS 1321	Preparation of Aluminum for Spotwelding by Use of the Abrasive Method
PS 1323	Cleaning and Polishing Plexiglas and Lucite
PS 1342	Sodium Hydride Descaling
PS 1422	Vapor Degreasing
PS 2111	Plating; Cadmium
PS 2115	Chromium Plating
PS 2121	Chromic Acid Anodizing
PS 2311	Type I - Chrome Pickle Treatment for Magnesium Alloys (Formerly Called Dow No. 1)
PS 2313	Type III - Dichromate Treatment for Magnesium Alloys (Commercially Known as Dow No. 7)

PS 2320 Chromadizing (Chromic Acid Dip)
PS 2322 Anodizing of Aluminum and Aluminum Alloys
PS 2330 Pickling and Passivating Stainless Steels
PS 2441 Special Protective Oil

2.3 Air Force - Navy Aeronautical Standard Drawing:

AN-535-2-3 Screw - Round Head Drive

3. REQUIREMENTS

3.1 Materials.- All materials and compounds shall be equivalent in quality to United States Air Force, United States Army, and Bureau of Aeronautics standards, with the specific exceptions stated herein. All finishing materials, substitutions, or equivalents shall be approved by the Engineering Department.

3.2 Workmanship.- Workmanship shall be in accordance with high-grade commercial practices.

3.3 Cleaning Metals.- All metal surfaces must be clean. At the time of installation all metal surfaces receiving no further finish are to be free of Beech applied identification paints (except part number and inspection stamps) perceptible through normal visual inspection of the finished airplane. Most shop-induced soil can be cleaned from metal by vapor degreasing or alkaline cleaning. Vapor degrease in accordance with Process Standard 1422 and alkaline clean in accordance with Process Standard 1132.

3.3.1 Aluminum Alloys.- Remove welding flux from aluminum alloy surfaces in accordance with Process Standard 1111. Spotweld etch in accordance with Process Standards 1143, 1321, or 1146. Etch prior to painting in accordance with Process Standards 1141, 1142, 2330, or 1146. Remove brazing flux in accordance with Process Standard 1117. Remove identification paint from tubing in accordance with Process Standard 1133.

3.3.2 Steel.- Remove scale resulting from welding or heat-treatment on steel surfaces by blasting, wire brushing, acid pickling in accordance with Process Standard 1113, or sodium hydride descaling in accordance with Process Standard 1342. Clean steel surfaces, prior to electroplating, in accordance with Process Standard 2111. Remove brazing flux with hot water and wire brushing. Clean accompanying soldering in accordance with Process Standard 1003.

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3.3.3 Magnesium Alloys.- Clean magnesium alloys, prior to Dow treatment, in accordance with Process Standards 2311 or 2313. Spotweld etch in accordance with Specification PS 280.

3.3.4 Copper Alloys.- Remove scale resulting from annealing copper alloys by copper pickling in accordance with Process Standard 1114. Remove brazing flux with hot water and wire brushing and clean accompanying soldering in accordance with Process Standard 1003.

3.3.5 Stainless Steel.- On stainless steel surfaces, remove scale resulting from welding or annealing by blasting, wire brushing, pickle-passivating in accordance with Process Standard 2330 or sodium hydride descaling in accordance with Process Standard 1342. Remove brazing flux in accordance with Process Standard 1119.

3.3.6 Lead.- Etch lead surfaces, prior to painting, by chromic acid dip in accordance with Process Standard 2330.

3.4 Cleaning Nonmetals.-

3.4.1 Wood.- Scuff - sand soiled wood before finishing.

3.4.2 Plexiglas or Lucite.- Clean soiled plexiglas or lucite surfaces in accordance with Process Standard 1323.

3.5 Surface Treatment of Metals.-

3.5.1 Aluminum Alloys.- Where specifically authorized by Beech drawing, give aluminum alloys corrosion protection by chromic acid anodizing in accordance with Specification AN-QQ-A-696 or by the alodine process in accordance with Specification MIL-C-5541. Process Standard 2121 contains specific instructions for meeting the requirements of Specification AN-QQ-A-696 and Process Standard 2322, for Specification MIL-C-5541.

3.5.2 Steel and Copper Alloys.- Where specifically authorized by Beech drawing, cadmium plate steel and copper alloys in accordance with Specification QQ-P-416 or chromium plate in accordance with Specification MIL-P-6871. Process Standard 2111 contains specific instructions for meeting the requirements of Specification QQ-P-416 and Process Standard 2115, for Specification MIL-P-6871.

3.5.3 Magnesium Alloys.- Where specifically authorized by Beech drawing, treat magnesium alloy surfaces for corrosion protection in accordance with Specification MIL-M-3171. Process Standards 2311 and 2313 contain specific instructions for meeting the requirements of MIL-M-3171.

3.5.4 Stainless Steel.- Pickle and passivate stainless steels in accordance with Process Standard 2330, under the following circumstances:

(a) After severe forming operations which might embed impurities in the material, particularly when the part is to be subsequently annealed or subjected to temperatures in excess of 300° F.

(b) After annealing.

(c) After sandblasting.

(d) After gas or arc welding.

3.5.5 Threads and Adjustable Parts.- When threads and adjustable parts are to be subsequently disconnected or disassembled, apply thread lubricants in accordance with Specification PS 358.

3.5.6 Bearing Surfaces.- Oil unplated, noncorrosion-resistant steel surfaces which act as bearings with a light oil before assembly.

3.5.7 Unplated Steel.- Coat with primer and one coat of finishing material, all parts which cannot be satisfactorily plated that do not act as bearing surfaces and/or are not assembled into a corrosion preventive environment, such as hydraulic fluid.

3.5.8 Interior of Closed Steel Parts.- Coat the interior surfaces of all closed or sealed steel parts that are more than two inches long and over 1/4-inch in outside diameter with raw linseed oil. Use a No. 44 drill for access holes. Use cadmium plated drive screws, AN-535-2-3 or equivalent, to plug the holes after treatment.

3.5.9 Interior of Open-Ended Steel Parts.- Prime the interior surface of all open-ended tubular steel parts of members not susceptible to plating, which are over 1/4-inch in inside diameter, unless the parts are threaded or serve as a bearing.

3.5.10 Reamed Fits.- In cases where it is necessary to ream at assembly for close fit of dissimilar metal parts of internal fixed structural pieces, insert the fitting part into the assembly wet with boiled linseed oil, or coated with magnaflux identification die.

3.5.11 Metals Contacting Nonmetals.- In addition to treatments specified in Sections 3.5.1 through 3.5.4 of this specification, further insulate the contacting areas of metal surfaces in intimate contact with other materials as follows:

(a) Put at least one coat of finishing material on metal surfaces in contact with leather (real or artificial), felt, fabric, cork, or rubber (natural or synthetic). This does not apply to small upholstery screws, nails, tacks, etc. or to surfaces joined by waterproof adhesives.

(b) Treat wood surfaces contacting metal with two coats of MIL-V-6893 varnish.

3.5.12 Metals Contacting Other Metals Except Magnesium.- With the exceptions noted below, apply a minimum of two coats of primer (one coat on each surface) to the overlapping portion (faying surfaces) of all metal joints and seams.

(a) Parts joined by welding, spotwelding, brazing, or soldering.

(b) Attachment fittings which act as connections for electrical conductivity between the various units of the airplane, such as the attachment fittings of the wings to the fuselage, engine control brackets, and other accessories.

(c) Terminals for electrical, radio, or bonding connection.

(d) Any combination of the following alloys: 2S, 3S, 4S, 52S, 61S, Clad 14S, Clad 24S, Clad 75S, and Clad 30S.

(e) Stainless steel to stainless steel, cadmium plated steel to cadmium plated steel, or other like plated metal to like plated metal.

(f) Parts which are assembled as a press fit before assembly.

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(g) Cadmium plated nuts, bolts, washers, and rivets.

(h) Wearing surfaces, threads, and oil holes.

(i) Primed anodized surfaces when in contact with alloys referred to in (d) or with any plated steel surface.

3.5.13 Metals Contacting Magnesium.- Prime with two coats of zinc chromate primer all magnesium alloy parts after they have received the treatment specified in Section 3.5.3 of this specification. Treat the metal contacting magnesium as detailed in the following paragraphs.

3.5.13.1 Magnesium to Magnesium.-

3.5.13.1.1 Riveted Connection.- If rivets other than 56S aluminum alloy are called out on the drawing, drive them wet with primer.

3.5.13.1.2 Bolted Connection.- If cadmium plated steel bolts are called out on the drawing, prime them before completing the assembly. The primer need not be wet at the time of making the assembly.

3.5.13.2 Magnesium to Aluminum.-

3.5.13.2.1 Riveted Connection.- Anodize, chromadize, or phosphoric-acid etch the aluminum. Prime the faying surfaces of the aluminum. If rivets other than 56S aluminum alloy are called out on the drawing, drive them wet with primer.

3.5.13.2.1.1 Special Case.- Under conditions where aluminum is riveted to magnesium in an assembly subsequently to be spotwelded, there will be neither chemical treatment nor primer on the magnesium. Process as described above for all riveted connections. Note: Such magnesium assemblies receive a chemical treatment and two coats of primer after spotwelding.

3.5.13.2.2 Bolted Connection.- Anodize, chromadize, or phosphoric-acid etch the aluminum. Prime the faying surfaces of the aluminum. If cadmium plated steel bolts are called out on the drawing, prime them before completing the assembly. The primer need not be wet at the time of making the assembly.

3.5.13.3 Magnesium to Steel.-

3.5.13.3.1 Riveted Connection.- Cadmium plate the steel. Prime the faying surfaces of the steel. If rivets other than 56S aluminum alloy are called out on the drawing, drive them wet with primer.

3.5.13.3.1.1 Special Case.- Under conditions where steel is riveted to magnesium in a magnesium assembly subsequently to be spotwelded, there will be neither chemical treatment nor primer on the magnesium. Process as described above for riveted assemblies. Note: Such magnesium assemblies receive a chemical treatment and two coats of primer after spotwelding.

3.5.13.3.2 Bolted Connection.- Cadmium plate the steel. Prime the faying surfaces of the steel. If cadmium plated steel bolts are called out on the drawing, prime them before completing the assembly. The primer need not be wet at the time of making the assembly.

3.5.13.4 Magnesium to Stainless Steel.-

3.5.13.4.1 Riveted Connection.- Prime the faying surfaces of the stainless steel. Apply one coat of aluminized varnish to the faying surfaces of both the stainless steel and the magnesium. Drive the rivets wet with primer.

3.5.13.4.2 Bolted Connection.- Prime the faying surfaces of the stainless steel. Apply one coat of aluminized varnish to the faying surfaces of both the stainless steel and the magnesium. If cadmium plated steel bolts are called out on the drawing, prime them before completing the assembly. The primer need not be wet at the time of making the assembly.

3.5.14 Protection of Noncorrosion-Resistant Parts During Process and Storage.- When manufacturing scheduling is such that delays occur during which noncorrosion-resistant parts may corrode, protect them by one of the following methods:

(a) Treat with Oakite protective oil in accordance with PS 2441.

(b) Treat with Specification MIL-C-6708 hard film, corrosion-preventive compound.

(c) Treat with Specification MIL-C-7853 aircraft engine, corrosion-preventive compound.

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(d) Treat with Specification AN-C-124 soft film, corrosion-preventive compound.

3.5.15 Interior Metal "Appearance Item" Parts:

3.5.15.1 Flush Rivets and Ridges Around Spotwelds.- To obtain a smooth surface for paint on floating instrument panels, circuit breaker box lids, and radio control panels, it is permissible to smooth up the heads of flush rivets and slight scratches with 280-grit sandpaper and finish with a 400-grit sandpaper. It is permissible to partially remove the ridges around spotwelds by the same procedure.

APPROVED:

Kenneth O'Gee
USAF Quality Control

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