BOMBARDIER
Toronto Site
PROPRIETARY INFORMATION

PPS 23.02

PRODUCTION PROCESS STANDARD

PROTECTIVE TREATMENT AND DECORATIVE SURFACE FINISH CODE SYSTEM

Issue 36
- This standard supersedes PPS 23.02, Issue 35.
- Vertical lines in the left hand margin indicate technical changes over the previous issue.
- Direct PPS related questions to christie.chung@aero.bombardier.com or (416) 375-7641.
- This PPS is effective as of the distribution date.

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Issue 36 - Summary of Changes (over the previous issue)

The following summaries are not detailed and are intended only to assist in alerting PPS users to changes which may affect them; refer to the applicable sections of this PPS for detailed procedure and requirements.

- Specified that Finish Code F1 (PPS 34.02) have been superseded by F19 Type 2 (PPS 34.08).

1 SCOPE

1.1 This Production Process Standard (PPS) is an index of the code system covering protective treatments and decorative surface finishes. It also cross references treatment codes with the applicable Production Process Standards and Material Specifications.

1.1.1 This PPS complements the engineering drawings that specify its use as an authorized instruction. The procedure specified in this PPS shall be followed to ensure compliance with all applicable specifications. In general, if this PPS conflicts with the engineering drawing, follow the engineering drawing. The requirements specified in this PPS are necessary to fulfil the engineering design and reliability objectives.

1.1.2 Refer to PPS 13.26 for the subcontractor provisions applicable to this PPS.

1.1.3 Procedure or requirements specified in a Bombardier BAPS, MPS, LES or P. Spec. do not supersede the procedure or requirements specified in this PPS.

2 HAZARDOUS MATERIALS

2.1 Before receipt at Bombardier Toronto, all materials shall be approved and assigned Material Safety Data Sheet (MSDS) numbers by the Bombardier Toronto Environment, Health and Safety Department. Refer to the manufacturer's MSDS for specific safety data on any of the materials specified in this PPS. If the MSDS is not available, contact the Bombardier Toronto Environment, Health and Safety Department.

3 REFERENCES

3.1 PPS 13.26 - General Subcontractor Provisions.

4 PROTECTIVE TREATMENT AND DECORATIVE SURFACE FINISH CODE INDEX

CODE	TREATMENT	PPS (Note 1)	MATERIAL SPECIFICATION
A1	Anodize, chromic acid (sealed)	32.03	—
A2	Anodize, hard sulphuric acid (sealed)	32.04	MIL-A-8625 Type III, Class I
A3	Anodize, colour or colourless sulphuric acid (Note 2)	32.05	—
A4	Anodize, phosphoric acid	36.10	—
A5	Anodize, boric and sulphuric acid (sealed) - **Withdrawn**, use A1	—	—
A6	Anodize, hard sulphuric acid (PTFE Impregnated)	32.04	MIL-A-63576 Type I
A7	Anodize, thin film sulphuric acid	32.36	MIL-A-8625 Type IIB

CODE	TREATMENT	PPS (Note 1)	MATERIAL SPECIFICATION
C1	Chemical conversion coating, dip application	32.01	MIL-C-5541 Class 1A
	Chemical conversion coating, manual application	32.02	
C2	Manganese phosphate	32.06	—
C3	Dry film lubricant, oven cure and wear resistant (Note 3) - Molykote 106	32.09	—
	Dry film lubricant, oven cure and wear resistant, for high temperature (Note 3) - Kal-Gard KG 200		
C4	Dichromate treatment, for magnesium alloys	32.07	—
C5	Zinc phosphate	32.08	—
C6	Primer, vinyl wash (MIL-C-8514) - **Superseded**, use F19	—	—
C7	Dry film lubricant, air dry, wear and fluid resistant (Note 3) - Molykote D-321R	32.09	—
C8	Dry film lubricant, air dry and corrosion resistant (Note 3) - MIL-L-23398	32.09	MIL-L-23398
	Dry film lubricant, air dry and corrosion resistant (Note 3) - Perma-Slik GLF		SAE AS 1701 Class II
	Dry film lubricant, air dry and corrosion resistant (Note 3) - Molykote 3402 - Sandstrom 26A		—
C9	Surface treatment of CRES steels	31.05	—
C10	Low electrical resistance chemical conversion coating, dip and manual application	32.35	MIL-C-5541 Class 3
E1	Cadmium plating - Carbon and low alloy steels below 200 - 220 ksi - Corrosion resistant steels below 200 - 220 ksi (Note 4) - Springs 200 - 220 ksi and greater	33.01	—
	Cadmium plating, high strength steels - **Superseded**, use M2	33.10	

CODE	TREATMENT	PPS (Note 1)	MATERIAL SPECIFICATION
E2	Chromium plating - Plate to size, standard - Plate to size, heavy duty, use only when specified on the engineering drawing - Grind to size, use only when specified on the engineering drawing	33.04	—
E3	Nickel plating, electro-deposited - used as a final coating, an undercoating for decorative chromium plating (E5 or E6), an undercoating for hard chromium plating (E2) or as an undercoating for cadmium plating stainless steel (E1)	33.03	—
E4	Nickel Plating - Electroless (Note 5) Class 1: As plated, no subsequent heat treatment Class 2: Heat treated by Type as shown below after plating: Type A: Heat treated for relief of hydrogen embrittlement Type B: Heat treated to increase plating hardness	33.06	—
E5	Chromium Plating, decorative, dull satin finish	33.07	—
E6	Chromium Plating, decorative, bright satin finish	33.07	—
E7	Copper Plating, when used for stopping-off areas of steel parts for carburizing, nitriding or heat treatment	33.05	—
	Copper Flash, when used as an undercoating for chrome plating		—
E8	Cadmium-Titanium plating, for low alloy steels heat treated up to 280 - 305 ksi	33.11	—
E9	Chromium plating, for steels heat treated to 220 - 240 ksi and above	33.04	—
F1	Primer, alkyd, zinc chromate (D90G - Green), for countersinks only, Type I (bulk), colour T (#34151 green to Federal Standard 595) - **Superseded**, use F19 Type 2 (see PPS 34.08)	34.02	—
F2	Lacquer, cellulose nitrate, pigmented flat (A-A-3164) or gloss (A-A-3165)	34.01	A-A-3164 A-A-3165
F3	Enamel, pigmented, finishing - **Superseded**, use F2, F22 or F24 (see PPS 34.01)	34.01	—
F4	Lacquer, cellulose nitrate, clear gloss	34.01	A-A-3165

CODE	TREATMENT	PPS (Note 1)	MATERIAL SPECIFICATION
F5	Baking enamel, alkyd, flat, pigmented Type I: Single/One Component Product Type II: Two Component Product	34.39	DHMS C4.07 Type I or Type II
F6	Lacquer, acid resistant - **Superseded**, use F22 or F24 (see PPS 34.01)	34.01	—
F10	Enamel, black - **Superseded**, use F5 (see PPS 34.01)	34.01	—
F11	Enamel, low temperature, baking - **Superseded**, use F22 or F24 (see PPS 34.01)	34.01	—
F12	Enamel, black or grey wrinkle finish - **Superseded**, use F2 (see PPS 34.04)	34.04	—
F13	Compound, corrosion preventive (Note 5) Grade 1: Hard film (MIL-PRF-16173, Grade 1; Tectyl 890; Petrotect 1-X)	16.01	MIL-PRF-16173 Grade 1
	Compound, corrosion preventive (Note 5) Grade 2: Soft film (MIL-PRF-16173, Grade 2; Petrotect 2; LPS-3)		MIL-PRF-16173 Grade 2
	Compound, corrosion preventive (Note 5) Grade 3: Soft film, water displacing Type I: colourless transparent (DHMS C4.12 Grade 3, Type I) Type II: coloured transparent (DHMS C4.12 Grade 3, Type II)		DHMS C4.12
	Compound, corrosion preventive (Note 5) Grade 4: Heavy film, water displacing Type I: colourless transparent (DHMS C4.12 Grade 4, Type I) Type II: coloured transparent (BMS 3-29 or DHMS C4.12 Grade 4, Type II)		Type I to DHMS C4.12 Type II to BMS 3-29 or DHMS C4.12
F14	Primer, urethane for polycarbonate substrate	34.07	BMS 10-83 Type I or DHMS C4.22 Type I
F16	Compound, jointing, corrosion preventive, DSC 489 (PRC-DeSoto CA1000, non-chromated)	34.05	—
F17	Primer, polyester, for magnesium alloys	34.06	—
F19	Primer, epoxy polyamide Type 2: Strontium chromate, green Type 3: Zinc phosphate, white	34.08	DHMS C4.01
F20	Enamel, polyurethane protective coating	16.08	DHMS C4.05

CODE	TREATMENT	PPS (Note 1)	MATERIAL SPECIFICATION
F21	Primer, integral fuel tanks, Type I, Grade A and Grade B: Polyurethane	21.03	DHMS C4.06
	Primer, integral fuel tanks, Type II, Class A: Epoxy		BMS 10-20
F22	Enamel, epoxy-polyamide, gloss, semi-gloss or lusterless	34.41	DHMS C4.11
F23	Enamel, epoxy, polyurethane compatible, corrosion resistant, intermediate, Type I: Reserved	—	DHMS C4.18
	Enamel, epoxy, polyurethane compatible, corrosion resistant, intermediate, Type II: Reserved		
	Enamel, epoxy, polyurethane compatible, corrosion resistant, intermediate, Type III: Rain erosion resistant, non-splitting	34.16	
F24	Enamel, polyurethane, pigmented or clear, gloss, semi-gloss, flat or textured Type 3: *Obsolete* Type 4: High flexibility, fluid resistant, and for aircraft exteriors Type 6: Flexible, rain erosion resistant, and for aircraft exteriors	34.03	DHMS C4.04
F25	**Cancelled** - Refer to Liaison Engineering	34.12	—
F26	**Cancelled** - Refer to Liaison Engineering	34.14	—
F27	**Cancelled** - Refer to Liaison Engineering	34.14	—
F28	Enamel, powder coatings Type I: Electrostatic spray application Type II: Fluidized bed application Class 1: High gloss Class 2: Semi-gloss Class 3: Low gloss	34.35	DHMS C4.10
F29	Enamel, polyurethane, Teflon filled, abrasion and impact resistant	34.13	DHMS C4.08
F30	**Cancelled** - Refer to Liaison Engineering	34.36	—
F31	Enamel, polyurethane, anti-static (high resistance type), flat black	34.15	DHMS C4.13 Type I
F32	Sealant, clear epoxy (Tempo 1900)	21.05	DHMS C4.11
F33	DSC 206-1, -2, -3 and -4 compound surface finishing sandable (for composite laminates and sandwich panel assemblies)	34.34	—

CODE	TREATMENT	PPS (Note 1)	MATERIAL SPECIFICATION
F34	Enamel, polyurethane, anti-static (low resistance type), flat black	34.15	DHMS C4.13 Type II
F35	Coating, epoxy, clear, fuel vapour barrier	16.11	DHMS C4.20
F36	Coating, polyurethane, anti-static, erosion resistant, unpaved runway protection (B-274/AS-P108)	34.18	—
F37	Enamel, polyurethane, pigmented or clear, gloss, lustreless, flat or textured Type 2 Class A: Standard flexibility and high hydraulic fluid resistance, for use as an aircraft non-decorative top coat in areas where high resistance to phosphate ester hydraulic fluid is required	34.03	DHMS C4.04 Type 2, Class A
F38	Coating, fire-proof, intumescent	16.12	—
F39	Coating, Plastisol - Soft, mar-resistant, decorative Type I: General purpose dip coat compound Type II: General purpose spray coat compound Type III: General purpose roller coat compound Class 1: General use Class 2: Fungus resistant	16.10	MIL-P-20689C
F40	Coating, polyurethane, anti-static, erosion resistant (B-274/AS-P108)	34.18	—
F41	Coating, anti-static, epoxy BMS 10-21 Type I has been **Superseded**, use BMS 10-21 Type III	34.19	BMS 10-21 Type III
F42	Enamel, urethane, interior decorative	34.20	BMS 10-83 Type II or DHMS C4.22 Type II
F43	**Cancelled** - Refer to Liaison Engineering	—	—
F44	**Cancelled** - Refer to Liaison Engineering	34.22	—
F45	Primer, high temperature, fluid resistant, epoxy	34.08	DHMS C4.21
F46	Liquid Adhesive Primer, modified epoxy phenolic, thermosetting	36.10	DHMS A6.03-1
F47	Epoxy primer/polyurethane base coat/polyurethane clear coat	34.25	DHMS C4.30
M1	Coating, aluminum wire spray	24.01	—

CODE	TREATMENT	PPS (Note 1)	MATERIAL SPECIFICATION
M2	Coating, ion vapour deposited aluminum Class 1: 0.0010" - 0.0020" thick (Note 6) Class 2: 0.0005" - 0.0009" thick (Note 6) Class 3: 0.0003" - 0.0004" thick (Note 6) Type I: As coated Type II: With supplementary conversion coating treatment	24.02	—
M3	Coating, Tungsten Carbide plus Cobalt, thermal spray	24.04	DHMS C4.19 Type I
SF11	Buffed finish, mirror bright	27.06	—
SF12	Buffed finish, semi-bright - **Superseded**, use SF11		—
SF21	Satin finish, bright		—
SF22	Satin finish, semi-bright		—
SF23	Satin finish, medium - **Superseded**, use SF22		—
SF24	Satin finish, coarse		—
SF31	Brush finish, fine - **Superseded**, use SF32		—
SF32	Brush finish, medium		—
SF33	Brush finish, course - **Superseded**, use SF32		—

Note 1. Unless otherwise specified by the engineering drawing, refer to the PPS specified for coating thickness requirements and/or coating allowance.

Note 2. In general, the engineering drawing will specify “A3 Colourless” when castings or decoratively surface finished aluminum parts require sulphuric acid anodizing. The engineering drawings will specify the specific colour for sulphuric acid coloured anodizing. If the engineering drawing only specifies “A3” (i.e., neither colourless nor colour), apply an A3 Colourless coating according to PPS 32.05.

Note 3. Ensure the correct pre-treatment is called out according to PPS 32.09. In addition to the pre-treatment, the final thickness of the dry film lubricant coating shall be 0.0002" - 0.0004".

Note 4. When specified on the engineering drawing, mask internal threads, holes or recesses.

Note 5. When the material type, class or grade of coating is not specified on the engineering drawing or PPS, contact Liaison Engineering.

Note 6. Maximum coating thickness applies when coating salt spray test panels, when a machining allowance is required and when the engineering drawing specifies a close tolerance (± 0.001" and less). In all other cases, coatings need only meet the minimum thickness requirements.