



STANDARD OVERHAUL PRACTICES MANUAL

APPLICATION OF POLYURETHANE RAIN EROSION RESISTANT COATING

**PART NUMBER
NONE**

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20-44-03

Page 1
Jul 01/2009



STANDARD OVERHAUL PRACTICES MANUAL

Revision No. 11
Jul 01/2009

To: All holders of APPLICATION OF POLYURETHANE RAIN EROSION RESISTANT COATING 20-44-03.

Attached is the current revision to this STANDARD OVERHAUL PRACTICES MANUAL

The STANDARD OVERHAUL PRACTICES MANUAL is furnished either as a printed manual, on microfilm, or digital products, or any combination of the three. This revision replaces all previous microfilm cartridges or digital products. All microfilm and digital products are reissued with all obsolete data deleted and all updated pages added.

For printed manuals, changes are indicated on the List of Effective Pages (LEP). The pages which are revised will be identified on the LEP by an R (Revised), A (Added), O (Overflow, i.e. changes to the document structure and/or page layout), or D (Deleted). Each page in the LEP is identified by Chapter-Section-Subject number, page number and page date.

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20-44-03

TRANSMITTAL LETTER

Page 1

Jul 01/2009

PART NUMBER NONE



STANDARD OVERHAUL PRACTICES MANUAL

Location of Change

Description of Change

NO HIGHLIGHTS

20-44-03

HIGHLIGHTS

Page 1

Jul 01/2009



STANDARD OVERHAUL PRACTICES MANUAL

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TITLE PAGE					
O 1	Jul 01/2009				
2	BLANK				
20-44-03 TRANSMITTAL LETTER					
O 1	Jul 01/2009				
2	BLANK				
20-44-03 HIGHLIGHTS					
O 1	Jul 01/2009				
2	BLANK				
20-44-03 EFFECTIVE PAGES					
1	Jul 01/2009				
2	BLANK				
20-44-03 CONTENTS					
1	Nov 01/2006				
2	BLANK				
20-44-03 REVISION RECORD					
1	Jul 01/2005				
2	Jul 01/2005				
20-44-03 RECORD OF TEMPORARY REVISIONS					
1	Jul 01/2005				
2	Jul 01/2005				
20-44-03 INTRODUCTION					
1	Jul 01/2005				
2	BLANK				
20-44-03 SUBJECT					
1	Jul 01/2005				
2	Jul 01/2005				
3	Jul 01/2005				
4	Jul 01/2005				
5	Jul 01/2005				
6	Jul 01/2005				
7	Jul 01/2005				
8	Jul 01/2005				

A = Added, R = Revised, D = Deleted, O = Overflow

20-44-03

EFFECTIVE PAGES

Page 1

Jul 01/2009



STANDARD OVERHAUL PRACTICES MANUAL

TABLE OF CONTENTS

<u>Paragraph Title</u>	<u>Page</u>
APPLICATION OF POLYURETHANE RAIN EROSION RESISTANT COATING	1
INTRODUCTION	1
MATERIALS	1
SURFACE PREPARATION	2
MIXING	3
APPLICATION	3
IN-PROCESS CORRECTIVE ACTION	8
QUALITY CONTROL	8

All revisions to this manual will be accompanied by transmittal sheet bearing the revision number. Enter the revision number in numerical order, together with the revision date, the date filed and the initials of the person filing.

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STANDARD OVERHAUL PRACTICES MANUAL

INTRODUCTION

1. General

- A. The instructions in this manual tell how to do standard shop procedures during maintenance functions from simple checks and replacement to complete shop-type repair.
- B. This manual is divided into separate sections:
 - (1) Title Page
 - (2) Transmittal Letter
 - (3) Highlights
 - (4) Effective Pages
 - (5) Contents
 - (6) Revision Record
 - (7) Record of Temporary Revisions
 - (8) Introduction
 - (9) Procedures
- C. Refer to SOPM 20-00-00 for a definition of standard industry practices, vendor names and addresses, and an explanation of the True Position Dimensioning symbols used.
- D. The data is general. It is not about all situations or specific installations. Use it as a guide to help you write minimum standards.
- E. If the component overhaul instructions are different from the data in this subject, use the component overhaul instructions.

20-44-03

INTRODUCTION

Page 1

Jul 01/2005

**STANDARD OVERHAUL PRACTICES MANUAL****APPLICATION OF POLYURETHANE RAIN EROSION RESISTANT COATING****1. INTRODUCTION**

- A. The data in this subject comes from Boeing Process Specification BAC5880. The airline has a copy of the Boeing Process Specifications Manual.
- B. The data is general. It is not about all situations or specific installations. Use this data as a guide to help you write minimum standards.
- C. Classification
 - (1) Type 1 – Rain Erosion Resistant Coating
 - (a) Class 1 – Black
 - (b) Class 2 – Nonyellowing White
 - (c) Class 3 – White
 - (d) Class 4 – (Reserved)
 - (e) Class 5 – Gloss Gray Color 707
 - (2) Type 2 – Antistatic Rain Erosion Resistant Coating
- D. Refer to SOPM 20-00-00 for a list of all the vendor names and addresses.

2. MATERIALS

WARNING: THESE FINISHES AND SOLVENTS ARE POISONOUS AND FLAMMABLE. DO ALL WORK IN A WELL VENTILATED AREA. OBEY ALL SAFETY AND FIRE PRECAUTIONS. DO NOT BREATHE VAPORS. IF CHEMICALS GET IN EYES, FLUSH WITH WATER FOR 15 MINUTES AND GET MEDICAL ATTENTION IMMEDIATELY. IF CHEMICALS GET ON SKIN, FLUSH WITH WATER. WIPE UP ALL SPILLS IMMEDIATELY.

NOTE: Equivalent substitutes can be used.

- A. Type 1 Coatings
 - (1) Class 1 – Black
 - (a) Black Caapcoat B-274 Vehicle, Curing Agent and Accelerator (V60922)
 - (b) Astrocoat Base 8000 and Catalyst 8100 (V60003)
 - (2) Class 2 – Nonyellowing White
 - (a) Nonyellowing White Caapcoat C-W4 Vehicle, Curing Agent, and Accelerator; MIL-C-83445, Class 1 (V60922)
 - (b) Astrocoat Base 8004 and Catalyst 8101 (V60003)
 - (3) Class 3 – White
 - (a) Astrocoat Base 8001 and Catalyst 8100 (V60003)
 - (4) Class 5 – Gray Caapcoat FP-200 Vehicle, Curing Agent and Accelerator (V60922)
- B. Type 2 Coatings (Antistatic)
 - (1) Astrocoat Antistatic Topcoat, Base 8003 and Catalyst 8100 (V60003)
 - (2) Caapcoat AS-P108 Vehicle and Catalyst; MIL-C-83231, Class A, Type 2 (V60922)
 - (3) Caapcoat AS-P108L Vehicle and Catalyst (flat black) (V60922)
- C. Primers

20-44-03



STANDARD OVERHAUL PRACTICES MANUAL

- (1) Astrocoat Primer Base 8200 (Part A) and Accelerator 8201 (Part B) (V60003)
 - (2) Chemglaze 9924 Wash Primer Base (Part A) and Catalyst (Part B) (V30676)
 - (3) Urethane Compatible, Corrosion Resistant Primer, BMS 10-79, Type 2, Grade A
- D. Thinners
- (1) Astrocoat Thinner 8300, or Low Aromatic Thinner 8301 (V60003)
 - (2) Caapcoat Polyurethane Thinner (V60922) or MIL-T-81772, Type 1.
 - (3) Methyl Isobutyl Ketone (MIBK), ASTM D 1153
- E. Solvents
- (1) Methyl Ethyl Ketone (MEK), TT-M-261
 - (2) Toluene (Toluol), TT-T-548 or JAN-T-171 Grade A
 - (3) Xylene, TT-X-916
 - (4) Series 94 (Ref SOPM 20-30-94)
- F. Miscellaneous
- (1) Abrasive Pads
 - (a) Scotch-Brite Finishing Type A, very fine (V76381)
 - (b) Aluminum Abrasive Nylon Pad Type F (V06565)
 - (2) Masking Tape, Solvent Resistant
 - (a) No. 226 or YR-239 (V76381)
 - (b) P-705 (V99742)
 - (3) Wipers, BMS 15-5, Class A
- 3. SURFACE PREPARATION**
- A. Give protection to all areas not to be touched by solvents, cleaners, or equivalent agents.
- B. Remove temporary coatings per SOPM 20-44-02.
- C. Remove all organic coatings, except polyurethane rain erosion resistant coatings, as follows:
- (1) Plastic laminates – Remove coatings down to the surfacer or the laminate by abrasive cleaning per SOPM 20-30-03. Do not expose the fibers of the laminate.
 - (2) Aluminum substrates – Remove organic coatings per SOPM 20-30-02. Solvent clean the surface per SOPM 20-30-03 until the wiper collects no visible residue.
- D. Prepare surface for coating
- CAUTION:** DO NOT LET SOLVENT STAY ON THE SURFACE TOO LONG A TIME, OR IT COULD CAUSE THE SURFACE TO SWELL.
- (1) Existing polyurethane rain erosion resistant coatings: Clean and reactivate with abrasive pads and water, then wipe with methyl ethyl ketone until the wiper collects no sign of coating residue.
 - (2) Fiberglass laminate: If the overhaul instructions do not give details, prepare the surface per SOPM 20-10-06 or BAC 5837. If the overhaul instructions do not give the primer, apply one coat of BMS 10-103 primer (but not wash primer) per BAC 5325 before you apply the rain erosion resistant coating.
 - (3) Clad aluminum:

20-44-03



STANDARD OVERHAUL PRACTICES MANUAL

- (a) Before you apply wash primer, give the clad surface a satin finish with Scotch Brite wet with solvent, then solvent clean per SOPM 20-30-03.
- (b) Before you apply BMS 10-79 primer, chemical treat per SOPM 20-43-03.
- (4) Anodized aluminum: Solvent clean per SOPM 20-30-03.
- (5) Aluminum flame sprayed surfaces:
 - (a) Before you apply wash primer, solvent clean per SOPM 20-30-03.
 - (b) Before you apply BMS 10-79 primer, chemical treat per SOPM 20-43-03.

4. MIXING

- A. Shake or fully stir each ingredient before you mix them together. Base and vehicle components must be smoothly continuous before you add catalyst or curing agent.
- B. Do not use more than the material amounts that are supplied in each kit.
- C. Do not mix kit components of different vendors.
- D. Mix and thin materials per Figure 1. Where thinner is used, do not use more than 1 volume part thinner to 2 volume parts mixed primer, or 1 volume part thinner to 4 volume parts mixed Type 1 or Type 2 coating material.
- E. The pot life of primers is 8 hours at or below 75°F, and 4 hours above 75°F. The pot life of Types 1 and 2 materials is 4 hours at or below 75°F and 2 hours above 75°F. Discard all mixed materials remaining after pot life.
- F. Unmixed primer and coating materials can be used until 24 months from date of manufacture if they were stored in accordance with standard industry practices, and if tests at 12 and 18 months from date of manufacture show that they agree with specifications. Discard materials more than 2 years old.

5. APPLICATION

- A. Apply primers and coatings by spray only, except as specified.
- B. Apply primer first, followed by a Type 1 coating, and then the topcoat, if applicable.
- C. Mix, thin and apply materials to get dry film thicknesses per Figure 1. If you use MIBK as a thinner, do not use more than shown in Figure 1.
- D. If you must stop more than 4 hours during application of Astrocoat Type 1 coating, do not catalyze the last coat applied before you stop. Continue application after 8 - 18 hours at 40-50% relative humidity and 70-75°F, if the last coat is dry to the touch. Be sure to catalyze the last coat applied.
- E. Immediately before you apply a subsequent coat, examine the last coat for signs of bubbles. If you find bubbles, decrease the thickness of the coat, wait more time between coats, or both. Small amounts of bubbles are acceptable if the next two coats applied do not show signs of bubbles.
- F. Cure coats per Figure 1 and Figure 2, as applicable. Note that Figure 2 uses the same curves for two different conditions, cured for recoat and final cure.

20-44-03



STANDARD OVERHAUL PRACTICES MANUAL

MATERIAL	MIX RATIO (PARTS BY VOLUME)	VISCOSITY, SECONDS ZAHN #2	MINIMUM RELATIVE HUMIDITY, %	DRY FILM THICKNESS, mils (0.001 INCH)		CURE TIMES, HOURS		
				PER COAT	TOTAL	TO RECOAT	TO OVERCOAT	FINAL
<u>PRIMER</u>								
CHEMGLAZE 9924A 9924B	1 1	26-29	NO MINIMUM	0.5 - 1.5	0.5 - 1.5	0.5 - 24	0.5 - 24	N/A
ASTROCOAT 8200A 8201B	1 1	26-29	NO MINIMUM	0.5 - 1.5	0.5 - 1.5	1 - 20	1 - 20	N/A
BMS 10-79			NO MINIMUM	0.3 - 0.8	0.3 - 0.8	N/A	2 - 24	N/A
<u>TYPE 1, CLASS 1</u>								
B-274 VEHICLE	16	22-28 AT 70-80°F. (RECOMMENDED)	NO MINIMUM	MAXIMUM: 1ST: 1.5 2ND & ON: 2.0	8 - 12	MINIMUM: 20 MINUTES MAXIMUM: 2 HRS.	2 - 8	TO HANDLE: 36
CURING AGENT ACCELERATOR	1 1							TO SERVICE: 48
ASTROCOAT 8000 BASE	32	27-29	40	0.5 - 1.0	10 - 14 8 - 12 	MINIMUM: SEE FIG. 2 MAXIMUM: 4 HRS.		TO HANDLE: 96 TO SERVICE: 240
8100 CATALYST	1.3							
<u>TYPE 1, CLASS 2</u>								
C-W4 VEHICLE	64	22-28 AT 70-80°F. (RECOMMENDED)	30	MAXIMUM: 1ST: 1.5 2ND & ON: 2.0	8 - 12	MINIMUM: 20 MINUTES MAXIMUM: 2 HRS.	2 - 8	TO HANDLE: 36
CURING AGENT ACCELERATOR	3 4							TO SERVICE: 48
ASTROCOAT 8004 BASE	32	27-29	40	0.5 - 1.0	10 - 14 8 - 12 	MINIMUM: SEE FIG. 2 MAXIMUM: 4 HRS.		TO HANDLE: 96 TO SERVICE: 240
8100 CATALYST	1.3				4 - 5 			

Mixing, Application, and Cure Requirements
Figure 1 (Sheet 1 of 3)

20-44-03



STANDARD OVERHAUL PRACTICES MANUAL

MATERIAL	MIX RATIO (PARTS BY VOLUME)	VISCOSITY, SECONDS ZAHN #2	MINIMUM RELATIVE HUMIDITY, %	DRY FILM THICKNESS, mils (0.001 INCH)		CURE TIMES, HOURS		
				PER COAT	TOTAL	TO RECOAT	TO OVERCOAT	FINAL
<u>TYPE 1, CLASS 3</u>								
ASTROCOAT 8001 BASE	3.2	22-28	40	0.5 - 1.0	10 - 14	MINIMUM: SEE FIG. 2 MAXIMUM 4 HRS.		TO HANDLE: 96 TO SERVICE: 240
8100 CATALYST	1.3				8 - 12 2			
					4 - 5 4			
<u>TYPE 1, CLASS 5</u>								
FP-200 VEHICLE	48	22-28 AT 70-80°F. (RECOMMENDED)	30	MAXIMUM: 1ST: 1.5 2ND & ON: 2.0	10-14	MINIMUM: 1/3 HR. MAXIMUM: 2 HRS.	2 - 8	TO HANDLE: 36 3
CURING AGENT ACCELERATOR	3 4							TO SERVICE: 48
FP-200 VEHICLE 7	100	22-28 AT 70-80°F. (RECOMMENDED)	30	MAXIMUM: 1ST: 1.5 2ND & ON: 2.0	10-14	MINIMUM: 1/3 HR. MAXIMUM: 4 HRS.	2 - 8	TO HANDLE: 36 3
CURING AGENT ACCELERATOR THINNER (MIBK)	5 5 22							TO SERVICE: 48
<u>TYPE 2</u>								
AS-P108 VEHICLE CATALYST	32 1	22-28	30	1 - 2	1 - 2	N/A	36	TO HANDLE: 36 5
								TO SERVICE: 48
AS-P108L VEHICLE CATALYST	32 1	22-28	30	1 - 2	1 - 2	N/A	36	TO HANDLE: 36 5
								TO SERVICE: 48
ASTROCOAT 8003 BASE	32	27-29	40	1 - 2	1 - 2	N/A	SEE FIG. 2	TO HANDLE: 36
8100 CATALYST	1.3							TO ASSEMBLY: 120 TO SERVICE: 240

Mixing, Application, and Cure Requirements
Figure 1 (Sheet 2 of 3)

20-44-03



STANDARD OVERHAUL PRACTICES MANUAL

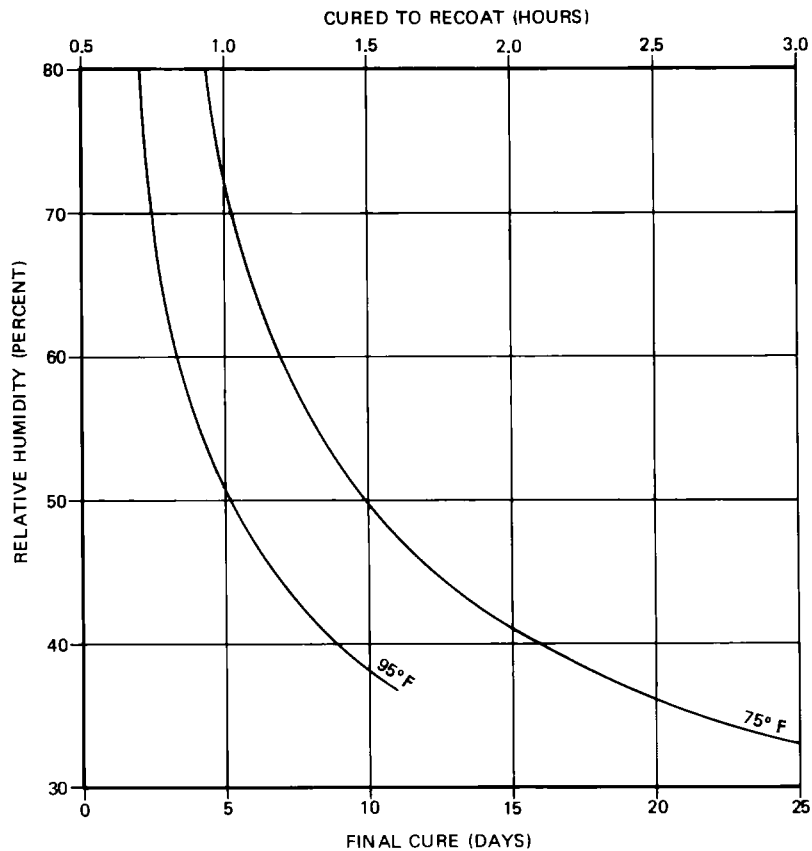
- 1 Let the mixed material wait 15 minutes before application
- 2 Dry film thickness necessary before application of Type 2
- 3 Cure can be made faster by 24 hours at room temperature followed by oven cure at 150°F for 3 hours
- 4 Dry film thickness necessary for Astrocoat 8004/8001 when applied over Astrocoat 8001/8100
- 5 If not tack free in 24 hours, continue cure at 40-70% relative humidity
- 6 BMS 10-79 primer is supplied as a two-component kit. Prepare the primer per 20-44-04.
- 7 FP-200 with MIBK thinner must not be used with Aeroglaze wash primer on fiberglass laminates.

Mixing, Application, and Cure Requirements
Figure 1 (Sheet 3 of 3)

20-44-03



STANDARD OVERHAUL PRACTICES MANUAL



Estimated Astrocoat Cure Times
Figure 2

20-44-03



STANDARD OVERHAUL PRACTICES MANUAL

6. IN-PROCESS CORRECTIVE ACTION

- A. Primer Coat: If the film is rough, lightly sand with 180 grit or finer aluminum oxide abrasive paper or pad, before you apply the rain erosion resistant coating. Remove sanding residues with wipers lightly wet with toluene or xylene per SOPM 20-30-03.

- B. Completed Topcoats – Minor Repair

- (1) No substrate exposed

CAUTION: DO NOT GO THROUGH TO THE PRIMER OR FIBERGLASS SUBSTRATE. IF YOU SEE THE FIBERGLASS SUBSTRATE, APPLY PRIMER, BUT DO NOT APPLY PRIMER OVER THE OLD POLYURETHANE LAYER.

- (a) Cut or sand off all loosened coatings. Sand smooth the area and the edges. Use 280 grit or finer abrasive. A small, high-speed disk sander is recommended.
- (b) Vacuum to fully remove the sand and dust.
- (c) Immediately before you start to apply the coating, wipe the sanded area with thinner. Wipe again with solvent on a clean wiper until you see no particles or discoloration on the wiper. Wipe dry with clean dry cloth.
- (d) With a brush, apply the appropriate polyurethane coating(s) to required thicknesses. Do not overlap this coating onto unsanded areas of the old finish.

- (2) Substrate Exposed

- (a) If you see small damaged areas of primer or epoxy fiberglass substrate, cut off the loosened coating. Sand to remove the remaining loosened coating, then make the area and the edges smooth with the good coating. Do not go through to the glass fabric.
- (b) Clean the repaired area with a bristle brush and a Series 94 solvent (Ref. SOPM 20-30-94) for one minute minimum. Immediately blot dry with a clean, dry cloth, then use a dry brush and vacuum to remove loose particles.
- (c) With a brush, apply the primer and coatings to the specified thicknesses. Do not apply primer over the old polyurethane coating.

7. QUALITY CONTROL

- A. The final finish must be smooth, continuous, and have no particles.
- B. The final dry film thickness must be within the limits of Figure 1, and the coatings must agree to the contour of the part.
- C. Resistivity of Type 2 coatings, as measured per MIL-C-83231, must be 0.5 - 1.5 megohms for coatings that are completely cured (5 or more days).

20-44-03