



## AEROPROTECT SPRAY ON PROTECTION TEST PLAN

Test Plan: TP-001

Revision: IR

Date: 08-10-15

1. **Purpose and Scope:** The purpose of this test plan is to identify various coupon configurations for flammability testing, visual appearance, impact resistance, heat and UV resistance, abrasion resistance and performance on polycarbonate and plated materials evaluation after the removal of the AeroProtect protective coatings. The scope of this testing will be noted in each of the types of testing categories listed in this test plan. Unless otherwise noted the protective coating film will be applied to a 3 to 8 mil thickness. The recommended application thickness is 6 to 8 mils.

### 2. Definitions:

**Test coupon:** unless otherwise noted a 3" X 12" panel consisting of, UTC 3P75 natural veneer applied to Teklam panel AE115-11-500A using 3M adhesive 1357. Duratec Veneer finish (high gloss or satin) applied in accordance with CAC finish procedure F-001.

**Control Specimen:** For cosmetic comparison, an existing 16" square sample panel that has already been created for customer review of high gloss and satin finish purposes.

### 3. Responsibilities:

**Cabinet shop:** Fabricate test coupons and control specimens. Selected management personnel will also perform the testing where applicable.

**Quality Control:** Conform coupon sizes and record the protective and high gloss or satin finish mil thickness average on test coupons by taking readings on a minimum of 3 different locations on each test coupon. Quality will also perform the visual comparison of the test coupon with the protective coating removed against the appropriate control specimen. Quality will be responsible for quarantining the specimens and monitoring the required durations during the test phase of this effort.

**Burn Lab:** FAA approved burn test facility that will perform the 60 second Bunsen burner test in accordance with 14 CFR FAR 25.853 Appendix F, Part 1 (a)(1)(i).



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### 4. Testing performed:

- a) **Flammability testing:** The burn test coupons (3 each/2 sets) will be fabricated in accordance with Table 1 below and the protective finish applied to one set of coupons labeled with the "A" suffix and the un-treated coupons labeled with the "B" suffix for each sample number. Once applied the protective coating will remain on the coupons in a gradually longer length of time in order to test the effects of time the protective finish stays on the coupon relative to its impact on flammability characteristics. The results of the burn testing will be recorded and made available for review upon request.

<b>BURN TEST *Natural Wood Veneer, High Gloss*</b>	Sample #1 (1 week)	Sample #2 (3 week)	Sample #3 (2 months)	<b>Tests are done after each numbered sample has had the material applied to finished veneer for the time frame noted in ( )</b>
	<del>A PASS</del> FAIL <del>B PASS</del> FAIL	<del>A PASS</del> FAIL <del>B PASS</del> FAIL	<del>A PASS</del> FAIL <del>B PASS</del> FAIL	

<b>BURN TEST *Natural Wood Veneer, Satin*</b>	Sample #4 (1 week)	Sample #5 (3 week)	Sample #6 (2 months)	<b>Tests are done after each numbered sample has had the material applied to finished veneer for the time frame noted in ( )</b>
	<del>A PASS</del> FAIL <del>B PASS</del> FAIL	<del>A PASS</del> FAIL <del>B PASS</del> FAIL	<del>A PASS</del> FAIL <del>B PASS</del> FAIL	

<b>BURN TEST *Composite Veneer, High Gloss*</b>	Sample #7 (1 week)	Sample #8 (3 week)	Sample #9 (2 months)	<b>Tests are done after each numbered sample has had the material applied to finished veneer for the time frame noted in ( )</b>
	<del>A PASS</del> FAIL <del>B PASS</del> FAIL	<del>A PASS</del> FAIL <del>B PASS</del> FAIL	<del>A PASS</del> FAIL <del>B PASS</del> FAIL	

<b>BURN TEST *Composite Veneer, Satin *</b>	Sample #10 (1 week)	Sample #11 (3 week)	Sample #12 (2 months)	<b>Tests are done after each numbered sample has had the material applied to finished veneer for the time frame noted in ( )</b>
	<del>A PASS</del> FAIL <del>B PASS</del> FAIL	<del>A PASS</del> FAIL <del>B PASS</del> FAIL	<del>A PASS</del> FAIL <del>B PASS</del> FAIL	

**Table 1**



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- b) Cosmetic testing:** One each test coupon will be fabricated in accordance to Table 2 below. The protective finish will be applied to the coupon and left on in a gradually increasing time frame as noted in the table. Once the duration time has been met the protective finish will be removed and the appearance of the test coupon will be compared to the control specimen.

<b>AFFECTS ON FINISH APPEARANCE</b> *Natural Wood Veneer, <u>High Gloss*</u>	Sample #13 (Immediate)	Sample #14 (1 Day)	Sample #15 (2 Days)	Sample #16 (3 Days)	Sample #17 (4 Days)	Samples are tested to see if any adverse affects occur to Finish based on time frame noted in ( ) of when material is applied after final finish step.
	YES / <b>NO</b>	YES / <b>NO</b>	YES / <b>NO</b>	YES / <b>NO</b>	YES / <b>NO</b>	

COMMENTS:

<b>AFFECTS ON FINISH APPEARANCE</b> *Natural Wood Veneer, <u>Satin*</u>	Sample #18 (Immediate)	Sample #19 (1 Day)	Sample #20 (2 Days)	Sample #21 (3 Days)	Sample #22 (4 Days)	Samples are tested to see if any adverse affects occur to Finish based on time frame noted in ( ) of when material is applied after final finish step.
	YES / <b>NO</b>	YES / <b>NO</b>	YES / <b>NO</b>	YES / <b>NO</b>	YES / <b>NO</b>	

COMMENTS:

<b>AFFECTS ON FINISH APPEARANCE</b> *Composite Veneer, <u>High Gloss*</u>	Sample #23 (Immediate)	Sample #24 (1 Day)	Sample #25 (2 Days)	Sample #26 (3 Days)	Sample #27 (4 Days)	Samples are tested to see if any adverse affects occur to Finish based on time frame noted in ( ) of when material is applied after final finish step.
	YES / <b>NO</b>	YES / <b>NO</b>	YES / <b>NO</b>	YES / <b>NO</b>	YES / <b>NO</b>	

COMMENTS:

<b>AFFECTS ON FINISH APPEARANCE</b> *Composite Veneer, <u>Satin*</u>	Sample #28 (Immediate)	Sample #29 (1 Day)	Sample #30 (2 Days)	Sample #31 (3 Days)	Sample #32 (4 Days)	Samples are tested to see if any adverse affects occur to Finish based on time frame noted in ( ) of when material is applied after final finish step.
	YES / <b>NO</b>	YES / <b>NO</b>	YES / <b>NO</b>	YES / <b>NO</b>	YES / <b>NO</b>	

COMMENTS:

**Table 2**



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**c) Impact testing:** One specimen from each finish configuration will be secured from the cosmetic testing. Half of the protective finish will be removed to expose the satin or high gloss finish. The specimen will be placed in a fixture that secures the specimen at an angle of 22.5° to horizontal. A Phillips screw driver weighing 8.25 oz. (234 grams) will be dropped (tip first) from a height of 27” on the protected side and unprotected side of the specimen. The type of damage will be recorded in table 3 below.

Screwdriver drop test	
Specimen configuration	Results
Satin (unprotected)	See photos in Appendix A
Satin (protected)	No telegraphing of impact on specimen once product was removed
High gloss (unprotected)	See photos in Appendix A
High gloss (protected)	No telegraphing of impact on specimen once product was removed

**Table 3**

**d) Heat and UV testing:** One coupon from each finish configuration will be secured and tested for effects of exposure to excessive heat and UV (sunlight) rays. One specimen with roll on finish and one specimen with sprayed on finish will be exposed to 190° F for 8 hours. Those same specimens will be exposed to 16 hours of direct sunlight. The coatings will then be removed and a visual inspection of the test specimens to the control specimens will be performed. The results will be recorded in table 4 below

Heat and UV testing		
Specimen configuration	Heat test results	UV test results
Satin (spray on finish)	No visible difference	No visible difference
Satin (roll on finish)	No visible difference	No visible difference
High gloss (spray on finish)	No visible difference	No visible difference
High gloss (roll on finish)	No visible difference	No visible difference

**Table 4**



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**e) Abrasion testing:** One coupon from each finish configuration will be secured and tested for effects of exposure to abrasion from three grits of sandpaper. The sandpaper will be affixed to a 6” wide strip of Kydex™ and will be weighted and the weights of each grit recorded. Half of the protective finish will be removed from each specimen. The strips will then be pulled across the protected and unprotected specimens. The results will be recorded in table 5 below.

Abrasion testing			
Specimen configuration	80 grit 7.48 oz.	120 grit 7.36 oz.	180 grit 7.39 oz.
Satin (spray on finish)	No signs of abrasion once product was removed	No signs of abrasion once product was removed	No signs of abrasion once product was removed
Satin (roll on finish)	No signs of abrasion once product was removed	No signs of abrasion once product was removed	No signs of abrasion once product was removed
Satin (unprotected)	See photo in Appendix B	See photo in Appendix B	See photo in Appendix B
High gloss (spray on finish)	No signs of abrasion once product was removed	No signs of abrasion once product was removed	No signs of abrasion once product was removed
High gloss (roll on finish)	No signs of abrasion once product was removed	No signs of abrasion once product was removed	No signs of abrasion once product was removed
High gloss (unprotected)	See photo in Appendix B	See photo in Appendix B	See photo in Appendix B

**Table 5**

**f) Polycarbonate testing:** Two variations of polycarbonate product were tested, a 24” square polycarbonate mirror and a 6” X 12” sample of a bonded tinted polycarbonate representing a divided cup holder usually found in galley drawers. In both cases the universal AeroProtect product was sprayed on left on for a minimum of 2 weeks. The same type of testing as noted in the abrasion testing above was performed on both specimens. The results will be recorded in table 6 below.

Polycarbonate testing			
Specimen type	80 grit 7.48 oz.	120 grit 7.36 oz.	180 grit 7.39 oz.
Polycarbonate mirror	No signs of abrasion once product was removed	No signs of abrasion once product was removed	No signs of abrasion once product was removed
Tinted polycarbonate	No signs of abrasion once product was removed	No signs of abrasion once product was removed	No signs of abrasion once product was removed

**Table 6**



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**g) Plated metal testing:** For this testing two plated items were secured, one was a plated metal sink and the other a plated latch. For both specimen tests the AeroProtect product was sprayed on left on for a minimum of 2 weeks. The same type of testing as noted in the abrasion testing above was performed on both specimens. The results will be recorded in table 7 below.

Plated testing	80 grit 7.48 oz.	120 grit 7.36 oz.	180 grit 7.39 oz.
Specimen configuration			
Plated sink	No signs of abrasion once product was removed	No signs of abrasion once product was removed	No signs of abrasion once product was removed
Plated latch	No signs of abrasion once product was removed	No signs of abrasion once product was removed	No signs of abrasion once product was removed

**Table 7**

**Approved:**

**Kurt Jansen - Author**      Approved: Kurt Jansen      Date: 8-25-15

**Mike Hammers V.P. Sales**      Approved: Mike Hammers      Date: 8/25/15

**Richard Skasick - Plant Mgr.**      Approved: Richard Skasick      Date: 8/25/15

**Kenny White - Quality**      Approved: Kenny White      Date: 8-26-15

**Mike Gueringer - Co-Owner**      Approved: Mike Gueringer      Date: 8-25-15

**Paul Reesnes - Co-Owner**      Approved: Paul Reesnes      Date: 8/25/15



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### APPENDIX A (Impact testing)



Satin Unprotected



High Gloss Unprotected



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#### APPENDIX B (Abrasion testing)



Satin Unprotected



High Gloss Unprotected