CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2006
DateRun:	06/30/2006
Experimenters:	Jason Marshall
ClientType:	Consultant
ProjectNumber:	Project #1
Substrates:	Wood
PartType:	Coupon
Contaminants:	Coatings
Cleaning Methods:	
Analytical Methods:	Performance Test
Purpose:	To evaluate abrasion resistance for various floor finishes

Experimental Procedure:

Control of Moisture Content and Temperature
The moisture content at the time of testing will influence results due to the hydroscopic nature of the base materials. Therefore, efforts must be taken to ensure that the moisture content and temperature remain constant during the evaluation period. Ideally, the sample floor should be kept at 65+/-1% relative humidity and 68+/-6 F.

During laboratory testing, conditions were 64% relative humidity and the temperature was ~74 F.

Sample Preparation
The flooring material supplied was Hardwood flooring made from Red Oak. The boards were ¾" thick, 2 ¼" wide and cut into 8" sections.

Three coupons were coated with a supplied floor finish according to the manufacturers' specifications. The finish was applied using a 1" Pure Bristle 1500 paint brush. To ensure proper coating application rates, the coatings were applied via pipettes to surface. Three coats were used for each floor finish as this was common number of coating layers suggested by the various manufacturers.

The first two coatings were allowed to dry for 2 hours prior to the application of the next coat. The second coat for the current process was allowed to dry overnight before the application of final coat. The Completed coupons were allowed to sit for a minimum period of 24 hours before performance evaluations were conducted.

Abrasion Resistance
The methodology used for this experiment uses little from the ASTM standard. The 80 grit aluminum oxide was used as sandpaper, the testing went for two, 100 cycles and the Navy-type Wear Tester instrument was replaced with the BYK Gardner Abrasion Tester (Figure 4).

Figure 1. Abrasion Tester Apparatus

Coupons were placed into the Abrasion tester and subjected to the 100 cycles with the 80 grit sandpaper. At the end of the first cycle, the coupons were wiped with a dry sponge to remove any dust that was generated. Three thickness measurements were made and recorded to determine the decrease in surface thickness. The coupon was then subjected to the second 100 revolutions with the sandpaper. Measurements were made in the same manner as the first set.

Results: Averages for both sets were calculated and compared to the other floor finishes.

Product	Initial Thickness	Overall Ave Coating
CP	0.7630	0.7636
	0.7659	
	0.7618	
MCP	0.7564	0.7547
	0.7568	
	0.7511	
BO	0.7594	0.7538
	0.7507	
	0.7512	
BW	0.7558	0.7578
	0.7574	
	0.7602	
Blank	0.7471	0.7494
	0.7453	
	0.7559	

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Coupon Thickness After Abrasion Testing

Cycle 1								
Product	Coupon	Center	End 1 A	End 2 A	Average	Final Coat - Cycle 1	Ave Product	Ave Cycle 1 Loss
CP	16	0.7602	0.7525	0.7594	0.7574	0.0057	0.7596	0.0040
	17	0.7583	0.7644	0.7638	0.7622	0.0037		
	18	0.7592	0.7584	0.7598	0.7591	0.0027		
MCP	19	0.7438	0.7501	0.7555	0.7498	0.0066	0.7482	0.0066
	20	0.7467	0.7520	0.7500	0.7496	0.0072		
	21	0.7447	0.7494	0.7412	0.7451	0.0060		
BO	22	0.7549	0.7555	0.7552	0.7552	0.0042	0.7471	0.0067
	23	0.7360	0.7472	0.7383	0.7405	0.0102		
	24	0.7371	0.7501	0.7497	0.7456	0.0056		
BW	25	0.7497	0.7511	0.7523	0.7510	0.0047	0.7491	0.0087
	26	0.7473	0.7477	0.7489	0.7480	0.0094		
	27	0.7490	0.7447	0.7511	0.7483	0.0119		
Blank	28	0.7378	0.7409	0.7420	0.7402	0.0069	0.7451	0.0043
	29	0.7439	0.7443	0.7453	0.7445	0.0008		
	30	0.7476	0.7547	0.7497	0.7507	0.0052		

Cycle 2

Cycle 2								
Product	Coupon	Center	End 1 A	End 2 A	Average	Final Coat - Cycle 2	Ave Product	Cycle 2 Ave Loss
CP	16	0.7590	0.7517	0.7521	0.7543	0.0088	0.7556	0.0079
	17	0.7556	0.7586	0.7572	0.7571	0.0088		
	18	0.7558	0.7533	0.7574	0.7555	0.0063		
MCP	19	0.7426	0.7426	0.7522	0.7458	0.0106	0.7455	0.0093
	20	0.7440	0.7498	0.7488	0.7475	0.0092		
	21	0.7433	0.7460	0.7398	0.7430	0.0080		
BO	22	0.7529	0.7546	0.7518	0.7531	0.0063	0.7440	0.0098
	23	0.7313	0.7450	0.7330	0.7364	0.0143		
	24	0.7308	0.7471	0.7495	0.7425	0.0088		
BW	25	0.7474	0.7496	0.7498	0.7489	0.0068	0.7468	0.0110
	26	0.7433	0.7462	0.7458	0.7451	0.0123		
	27	0.7480	0.7409	0.7503	0.7464	0.0138		
Blank	28	0.7372	0.7404	0.7381	0.7386	0.0085	0.7430	0.0064
	29	0.7397	0.7377	0.7447	0.7407	0.0046		
	30	0.7472	0.7542	0.7480	0.7498	0.0061		

Average Loss

	Initial Thickness	Average Loss		Total Loss	Beyond Coating
		Cycle 1	Cycle 2		
CP	0.0056	0.0040	0.0039	0.0079	0.0024
MCP	0.0061	0.0066	0.0027	0.0093	0.0032
BO	0.0061	0.0067	0.0031	0.0098	0.0037
BW	0.0055	0.0087	0.0023	0.0110	0.0055
Blank	0.0000	0.0043	0.0021	0.0064	0.0064

Figure 2 compares coating losses visually.

Summary:

Conclusion: The current practice had the greatest resistance to the abrasion, followed by the modified process and the Bona - Oil based mix.