CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2005
DateRun:	06/23/2005
Experimenters:	Jason Marshall
ClientType:	Environmental Service Firm
ProjectNumber:	Project #1
Substrates:	Wood
PartType:	Coupon
Contaminants:	Coatings
Cleaning Methods:	
Analytical Methods:	Performance Test
Purpose:	To evaluate abrasion resistance for additional 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 slightly drier, 40% relative humidity, but the temperature was within the given temperature range ~70 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. Some pieces of the flooring had to be sanded prior to making initial thickness readings to remove residual packing tape adhesive. With the boards cut into 8" coupons, three readings were made using a Brown & Sharpe Micrometer to measure each coupons initial board thickness. Each reading was made to 0.001" and the three values were averaged to give a baseline thickness for the coupons. In addition to the thickness baseline, baselines were established for Gloss, Coefficient of Friction, Impact, Small Area Loads. Procedures for each baseline measurements followed the procedures to be outlined.

Following the establishment of the baselines, 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 consistent coating application, the finish was leveled off using a 10 mils Precision Gage & Tool Co Dow Film Caster. Three coats were used for each floor finish as this was common number of coating layers suggested by the various manufacturers. Each coating layer was allowed to dry for 2 hours prior to the application of the next coat. 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 1).

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

Results:

Product ID Products Tested:
1 Hydro 202 Satin
6 SafeCoat Satin
7 SafeCoat Gloss

		Initial					Coated					Average Initial Coating Thickness
	Coupon #	Middle	End 1	End 2	Ave Microm	Set Average	Middle	End 1	End 2	Ave Microm	Set Average	
6	2	7.558	7.555	7.572	7.562	7.517	7.585	7.674	7.575	7.611	7.541	0.024
	3	7.422	7.480	7.597	7.500		7.490	7.520	7.506	7.505		
	4	7.451	7.461	7.561	7.491		7.437	7.522	7.563	7.507		
7	11	7.487	7.482	7.486	7.485	7.555	7.494	7.519	7.495	7.503	7.556	0.002
	12	7.589	7.561	7.607	7.586		7.607	7.580	7.613	7.600		
	13	7.598	7.603	7.579	7.593		7.563	7.572	7.563	7.566		

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1	49	7.537	7.547	7.521	7.535	7.441	7.567	7.529	7.573	7.556		
	50	7.513	7.518	7.511	7.514		7.561	7.553	7.558	7.557	7.480	0.039
	51	7.376	7.406	7.043	7.275		7.409	7.102	7.470	7.327		

Coupon Thickness After Abrasion Testing

Product	Coupon		Center	End 1 A	End 2 A	Average	Final Coat - Cycle 1	Ave Product
6	2	Cycle 1	7.577	7.521	7.567	7.555	0.056	7.506
	3		7.483	7.481	7.484	7.483	0.023	
	4		7.424	7.530	7.486	7.480	0.027	
7	11		7.468	7.467	7.494	7.476	0.026	7.535
	12		7.578	7.569	7.586	7.578	0.022	
	13		7.528	7.568	7.559	7.552	0.014	
1	49		7.504	7.545	7.510	7.520	0.037	7.446
	50		7.532	7.543	7.522	7.532	0.025	
	51		7.393	7.042	7.421	7.285	0.042	
6	2	Cycle 2	7.563	7.510	7.551	7.541	0.070	7.495
	3		7.469	7.470	7.470	7.470	0.036	
	4		7.411	7.538	7.477	7.475	0.032	
7	11		7.452	7.454	7.477	7.461	0.042	7.521
	12		7.566	7.560	7.583	7.570	0.030	
	13		7.514	7.556	7.524	7.531	0.035	
1	49		7.497	7.532	7.526	7.518	0.038	7.427
	50		7.513	7.516	7.495	7.508	0.049	
	51		7.376	7.010	7.374	7.253	0.074	

Summary

Product	Finished	Cycle 1	Cycle 2
Hydro 202 Satin	0.024	0.0354	0.046
SafeCoat Satin	0.002	0.0210	0.036
SafeCoat Gloss	0.039	0.0344	0.054

Summary:

Conclusion: All the products tested showed loss in coating thickness after 100 passes of the 80 grit sand paper. The subsequent 100 passes had less impact on thickness than the first 100 passes did. The second set of floor finishes showed similar losses as the first set of products did.