CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2005

DateRun: 06/07/2005

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 rolling load 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 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.

Rolling Load
Measurements made during the rolling load will reveal damage to the coupon surface from repeated rolling forces, simulating heavy castored loads such as beds, desks and appliances. Coupons were placed into a holding device and clamped to restrict movement of the coupon. A load sled was constructed using a wood plank and three castor wheels. The round, hard wheels were 2" in diameter and 1" wide. The sled was loaded with 200 pounds. Figure 3 shows the sled passing over the surface of the finished coupon.

Figure 3. Rolling Load Apparatus

Ten passes (5 cycles) were completed and the three measurements were made along the path of the sled wheel. An additional 15 passes were made with three more measurements made. Following the 25 passes, another 25 passes were made with the deformation measurements. The averages for the three sets of passes were calculated. Any notable surface changes were recorded. The results for each floor finish were compared to the other finishes.

Results: Rolling Load Resistance

			Initial Readings				Final readings			
Coating	Coupon	# passes	Middle	End 1	End 2	Ave Microm	Middle	End 1	End 2	Ave Microm
2	37	10	7.548	7.565	7.532	7.548	7.542	7.508	7.537	7.529
		25					7.513	7.500	7.519	7.511
		50					7.505	7.497	7.505	7.502
	38	10	7.512	7.527	7.458	7.499	7.509	7.453	7.475	7.479
		25					7.500	7.440	7.454	7.465
		50					7.485	7.435	7.441	7.454
	39	10	7.541	7.520	7.545	7.535	7.521	7.523	7.543	7.529
		25					7.508	7.467	7.461	7.479

CLEANING LABORATORY EVALUATION SUMMARY

		50					7.457	7.492	7.454	7.468
3	40	10	7.506	7.543	7.495	7.515	7.502	7.516	7.492	7.503
		25					7.500	7.505	7.483	7.496
		50					7.495	7.492	7.467	7.485
	41	10	7.552	7.531	7.515	7.533	7.531	7.515	7.522	7.523
		25					7.522	7.506	7.487	7.505
		50					7.491	7.489	7.510	7.497
	42	10	7.538	7.517	7.526	7.527	7.524	7.511	7.488	7.508
		25					7.500	7.500	7.502	7.501
		50					7.489	7.473	7.470	7.477
4	43	10	7.454	7.427	7.461	7.447	7.391	7.388	7.390	7.390
		25					7.365	7.344	7.370	7.360
		50					7.369	7.333	7.380	7.361
	44	10	7.484	7.456	7.473	7.471	7.448	7.411	7.412	7.424
		25					7.424	7.395	7.376	7.398
		50					7.367	7.411	7.376	7.385
	45	10	7.507	7.500	7.496	7.501	7.442	7.435	7.438	7.438
		25					7.381	7.377	7.374	7.377
		50					7.379	7.382	7.358	7.373
5	46	10	7.516	7.484	7.508	7.503	7.446	7.433	7.455	7.445
		25					7.430	7.370	7.445	7.415
		50					7.430	7.427	7.430	7.429
	47	10	7.460	7.457	7.458	7.458	7.402	7.408	7.381	7.397
		25					7.394	7.340	7.376	7.370
		50					7.375	7.364	7.359	7.366
	48	10	7.488	7.481	7.423	7.464	7.430	7.459	7.421	7.437
		25					7.418	7.449	7.452	7.440
		50					7.418	7.445	7.422	7.428

Summary

Floor Coating	10	25	50	Total Depression Depth	Rank	Rank
Polyurethane Gloss	0.036	0.028	0.010	0.074	2	3
WB Polyurethane	0.003	0.011	0.014	0.028	1	1
WB Sanding Sealer	0.030	0.039	0.006	0.075	3	4
Aqua Deva Metro	0.077	0.018	0.0004	0.095	4	6
Hydro 202 Satin	0.023	0.039	0.031	0.093	2	5
SafeCoat Satin	0.017	0.041	0.016	0.073	1	2
SafeCoat Gloss	0.074	0.042	0.054	0.171	3	7

Summary:

Conclusion: Pro Finishers Water Based Polyurethane had the most resistance to rolling load, followed by Capitol Polyurethane Gloss.