CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2010
DateRun:	07/26/2010
Experimenters:	Jason Marshall, Timothy Weil
ClientType:	Cleaning Equipment Mfr
ProjectNumber:	Project #1
Substrates:	Vinyl Composite Tiles
PartType:	Coupon
Contaminants:	Hucker's Soil
Cleaning Methods:	Manual Wipe
Analytical Methods:	Gravimetric, Gloss-Color Meter
Purpose:	To determine effectiveness of various cleaning liquids on soiled floor tiles using mechanical equipment.
Experimental Procedure:	A set of 21 two inch by four-inch coupons were selected for comparison of seven cleaning alternatives. Coupons were evaluated using gravimetric analysis for weight removal and a BYK Spectro Guide gloss/ color meter to determine clean baseline. The coupons were then soiled, and readings were taken to determine the soiled baseline values of tiles previously coated with Hucker's Soil Formulation (Jiffy Creamy Peanut Butter 9.2%, Salted Butter 9.2%, Arrowhead Mills stone ground wheat flour 9.2%, Egg Yolk 9.2%, Evaporated milk 13.8%, Distilled water 45.8%, Printer's ink with boiled linseed oil 0.9%, Shaws saline solution 2.7%). Three coupons were placed into a Gardner Straight Line Washability unit. An Americo Red Buff floor maintenance pad was installed. Upon the completion of the cleaning, final weights and L-values were recorded. The L-values and gravimetric readings were used to determine how close the cleaned coupon was to the original appearance. The cleaning process was repeated using hot water (120 F), hot water (140 F), Zep Commercial Neutral Floor Concentrate (1 oz/gallon~0.78%). Zep Commercial Neutral Floor Concentrate @ 5 % concentration in tap water, Commercial Neutral Floor Concentrate @ 10 % concentration in tap water, cold water and electrolyzed water (supplied via an Activelon unit).
Results:	The inline cleaning results showed cleaning for each fluid tested. Based on gravimetric and L-value readings, the neutral cleaner at the 10% concentration had the highest removal of soil. Gravimetrically, the electrolyzed water was the next best followed by hot water. The Alkaline cleaner @ 0.78% had the same performance as cold water. The L-value results were not as conclusive. All of the products tested were found to be nearly identical except the top performing product.

Process	Initial wt	Final wt	% Removed	Ave Removal	Rank
Hot water @ 120°F	0.0465	0.0120	74.19	75.63	4
	0.0279	0.0089	68.10		
	0.0266	0.0041	84.59		
Hot water @ 140°F	0.0544	0.0130	76.10	80.27	3
	0.0569	0.0096	83.13		
	0.0396	0.0073	81.57		
Alkaline cleaner @ 0.78%	0.0406	0.0154	62.07	68.38	7
	0.0496	0.0139	71.98		
	0.0398	0.0115	71.11		
Alkaline cleaner @ 5%	0.0409	0.0081	80.20	71.57	5
	0.0476	0.0103	78.36		
	0.0349	0.0153	56.16		
Alkaline cleaner @ 10%	0.0476	0.0052	89.08	93.28	1
	0.0300	0.0005	98.33		
	0.0344	0.0026	92.44		
Cold water	0.0348	0.0118	66.09	68.38	6

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	0.0282	0.0070	75.18		
	0.0227	0.0082	63.88		
Electrolyzed water	0.0251	0.0041	83.67	87.65	2
	0.0323	0.0044	86.38		
	0.0282	0.0020	92.91		

Soil removal by light-dark

Process	Initial L-Value	Dirty L-Value	Final L-Value	% decrease	% cleaned	Ave L value	40 cycle inline cleaning
Hot water @ 120°F	82.03	25.67	52.41	31.29	63.89	61.15	3
	85.02	33.85	52.25	39.81	61.46		
	85.16	31.08	49.49	36.50	58.11		
Hot water @ 140°F	83.58	30.48	50.75	36.47	60.72	59.79	6
	85.29	31.83	51.04	37.32	59.84		
	84.78	34.54	49.86	40.74	58.81		
Alkaline cleaner @ 0.78%	85.27	33.32	48.68	39.08	57.09	59.55	7
	85.24	29.91	50.02	35.09	58.68		
	84.39	30.14	53.07	35.72	62.89		
Alkaline cleaner @ 5%	85.90	31.32	60.36	36.46	70.27	60.80	4
	81.63	28.62	48.31	35.06	59.18		
	85.46	29.56	45.25	34.59	52.95		
Alkaline cleaner @ 10%	81.98	30.05	66.39	36.66	80.98	88.31	1
	81.80	28.98	76.21	35.43	93.17		
	81.33	33.07	73.83	40.66	90.78		
Cold water	81.90	30.44	48.32	37.17	59.00	62.31	2
	85.73	30.05	52.09	35.05	60.76		
	82.57	32.07	55.47	38.84	67.18		
Electrolyzed water	84.96	30.78	51.95	36.23	61.15	60.44	5
	81.18	31.30	48.44	38.56	59.67		
	82.33	31.25	49.81	37.96	60.50		

Summary:

Substrates:	Vinyl Composite Tiles				
Contaminants:	Hucker's Soil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Water	Water	100	68.38	☐	
Water	Water	100	75.63	☐	
Water	Water	100	80.27	☐	
Tennent Corporation	Tennent Electrolyzed Water	100	87.65	☑	electrolyzed water
ZEP Manufacturing Company	Neutral Floor Cleaner Concentrate	10	93.28	☑	

Conclusion:

The gravimetric analysis compared more closely with the expected outcome of hard floor cleaning than the L-value readings. In both cases, however, the top performing product was identified as being the 10% Neutral cleaner.