CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2010
DateRun:	04/08/2010
Experimenters:	Junhee Cho
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #1
Substrates:	Textile
PartType:	Coupon
Contaminants:	Dirt
Cleaning Methods:	Manual Wipe
Analytical Methods:	Gloss-Color Meter
Purpose:	To evaluate supplied product for carpet cleaning as compared to an industry standard product.

Experimental Procedure:

The procedure followed is a modified version of the Institute of Inspection Cleaning and Restoration Certification (IICRC) Standard and Reference Guide S100. Much of the testing was modeled after Appendix D, IICRC Carpet Cleaning Methods Testing Protocol. The carpet substrate was donated by Shaw Industries of Dalton, GA. This carpet type is specifically designated in the IICRC Appendix method. An AATCC (Research Triangle Park, NC) soil was obtained from Textile Innovators, a division of SDL Atlas of Charlotte, NC, as suggested by DuPont Antron of Kennesaw, GA.

Prior to soiling, a BYK spectro-guide color/gloss meter was used to establish a baseline L-value from the surface of the carpet. Each carpet was marked-off into 6 sections measuring 3.5 in wide and 6 in long. (The carpeting was not cut into individual pieces as it would be too difficult to physically soil and clean smaller carpet sections.) Six readings were taken in each grid area to obtain baseline readings. Modifications to the above-mentioned standard included: (1) omitting the use of milling stones and (2) replacing the Zytel Type 6,6 nylon pellets with Nalgene tubing cut into 1/8 inch pieces, or ‘pellets’. According to the standard, approximately 1000 grams of pellets should be used for every 12 grams of soil or, 83 grams of pellets used per gram of soil. S100 also suggests using 500 grams of pellets for each soil under investigation (in this case, one) for carpet measuring 10.375 inch x 39.375 inch (408.5 sq. in.). This equals 1.22 (500/408.5 = 1.22) grams of pellets per square inch of carpet. Since the Lab had 174 grams of tubing/pellets at its disposal, two grams of the AATCC soil were needed to artificially contaminate the carpet.

The carpet was cut into 7.375 inch x 19.6 inch (144.54 sq. in.) pieces. The carpet pieces were soiled by placing one piece of carpet into a 1-gallon can, making sure the carpet lined the inner wall of the can. The plastic-tubing pieces were poured into the bucket and the soil was distributed along the width of the can. The can was lidded and placed into a harness attached to a crank shaft. The crank was turned at an average rate of 42 rpm by hand for 5 minutes in one direction, followed by 5 minutes of rotation in the opposite direction. At the end of the 10-minute soiling regime, the carpet was placed onto a carpet template and vacuumed with a vacuum cleaner for 3 strokes in the forward direction followed by 3 strokes in the backward direction. The carpet pieces were evaluated again for L-value levels.

The carpet sections were then cut down the middle, lengthwise to allow carpet samples to fit into the Gardner Straight Line Washability Unit. Each piece was marked-off into three sections. Each section was sprayed 15 times with the cleaning product and allowed to soak for 30 seconds. A Kimberly-Clark Wypall reinforced paper towel was attached to the cleaning sled. The towel was also sprayed with the same cleaning product until the towel was saturated (approx. 15 sprays).

After soaking, the towel/sled was placed on one end of the carpet section and the Unit run for 91 cycles (approx. 2.5 minutes). Every 30 cycles, each section of carpet was sprayed 6 times with the cleaning solution. The carpet was removed from the Unit and allowed to dry overnight. A third and final series of color meter readings were recorded for each cleaned section.

Results:

Initial color meter readings of pre-treated carpet samples were used as cleanliness baselines. The average ‘soiled’ readings were subtracted from the average initial readings to establish the degree of soiling for any particular carpet sample before cleaning. To determine the level of cleanliness achieved upon testing, the average soiled readings were subtracted from the average final (i.e., cleaned) readings taken after testing and divided by the average initial readings.

MD Steston PC 220 at 1:256 had the largest increase in L-values after the 2.5 minutes of cleaning, followed by MD Steston PC 120 at 1:128. Four of the dilutions used had greater increase in L-values than the conventional product did. After 5 minutes of cleaning, the MD Steston PC 120 @ 1:128 had the greatest increase followed by MD Steston PC 220 @ 1:256. Several of the dilutions resulted in a lower L-value reading with the extended cleaning times, including the conventional product.

Table 1 contains the data collected for the color meter readings of the products and the selected industry standard product. The second table contains the average L-values by dilution. The final table lists the calculated % change in L-values.

cleaner	sub(part)				

CLEANING LABORATORY EVALUATION SUMMARY

		Initial L value	Dirty L value	cleaning (2.5min) L value	final L value
MD Steston PC 120 1:64	A	82.03	62.37	63.01	64.91
MD Steston PC 120 1:64	B	82.25	73.54	72.38	71.07
MD Steston PC 120 1:64	C	81.61	63.06	65.59	65.17
MD Steston PC 120 1:128	A	79.86	62.32	65.05	69.87
MD Steston PC 120 1:128	B	81.52	71.94	72.69	73.12
MD Steston PC 120 1:128	C	79.06	65.39	65.26	67.73
MD Steston PC 120 1:256	A	80.12	65.01	66.82	65.19
MD Steston PC 120 1:256	B	78.44	63.24	64.95	63.97
MD Steston PC 120 1:256	C	79.75	71.68	68.52	68.48
MD Steston PC 220 1:64	A	78.58	62.25	64.90	65.44
MD Steston PC 220 1:64	B	79.64	69.54	69.59	66.61
MD Steston PC 220 1:64	C	79.23	69.14	67.91	67.82
MD Steston PC 220 1:128	A	80.18	66.25	65.98	61.54
MD Steston PC 220 1:128	B	80.94	63.40	62.17	61.37
MD Steston PC 220 1:128	C	81.54	70.32	68.48	67.84
MD Steston PC 220 1:256	A	76.60	62.46	67.17	66.71
MD Steston	B	78.76	59.97	60.14	63.58

CLEANING LABORATORY EVALUATION SUMMARY

PC 220 1:256					
MD Steston PC 220 1:256	C	76.03	73.96	73.03	71.21
Chemspec Liquid 90 1:320	A	80.56	63.38	66.38	64.79
Chemspec Liquid 90 1:320	B	80.39	66.95	65.45	63.62
Chemspec Liquid 90 1:320	C	80.61	67.78	66.81	66.42

Calculated Average Cleaning L-Values

	Ave Int	Ave Dirty	Ave Clean 1	Ave Clean 2
MD Steston PC 120 1:64	81.96	66.32	66.99	67.05
MD Steston PC 120 1:128	80.15	66.55	67.67	70.24
MD Steston PC 120 1:256	79.44	66.64	66.76	65.88
MD Steston PC 220 1:64	79.15	66.98	67.47	66.62
MD Steston PC 220 1:128	80.89	66.66	65.54	63.58
MD Steston PC 220 1:256	77.13	65.46	66.78	67.17
Chemspec Liquid 90 1:320	80.52	66.04	66.21	64.94

Soil removal rates for 2.5 and 5 minutes of cleaning

	Ds	Dc 2.5	%Change 2.5	Dc 5	%Change 5
Cleaner	Initial-Dirty	Clean-Dirty	Dirty/Clean*100	Clean-Dirty	Dirty/Clean*100
MD Steston PC 120 1:64	15.64	0.67	4.28	0.73	4.65
MD Steston PC 120 1:128	13.60	1.12	8.21	3.69	27.14
MD Steston PC 120 1:256	12.79	0.12	0.94	-0.76	-5.97
MD Steston PC 220 1:64	12.17	0.49	4.03	-0.35	-2.90
MD Steston PC 220 1:128	14.23	-1.11	-7.82	-3.07	-21.60
MD Steston PC 220 1:256	11.67	1.32	11.29	1.70	14.60
Chemspec Liquid 90 1:320	14.48	0.18	1.22	-1.09	-7.55

Summary:

Substrates:	Textile

CLEANING LABORATORY EVALUATION SUMMARY

Contaminants:	Dirt				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Next-Gen Supply Group	PC 120 Peroxide Mulitsurface Cleaner	1.56	0.00	☐	
Next-Gen Supply Group	PC 120 Peroxide Mulitsurface Cleaner	0.78	0.00	☑	
Next-Gen Supply Group	PC 120 Peroxide Mulitsurface Cleaner	0.39	0.00	☐	
Chemspec	Liquid Formula 90	0.16	0.00	☐	
Next-Gen Supply Group	PC 220 Peroxide Multipurpose Cleaner	1.56	0.00	☐	
Next-Gen Supply Group	PC 220 Peroxide Multipurpose Cleaner	0.78	0.00	☐	
Next-Gen Supply Group	PC 220 Peroxide Multipurpose Cleaner	0.39	0.00	☑	

Conclusion: MD Steston PC 120 @ 1:128 and MD Steston PC 220 @ 1:256 both were more successful at 2.5 and 5 minutes of cleaning than the conventional product.