CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2016
DateRun:	12/05/2016
Experimenters:	George Liang, Nicholas Landberg
ClientType:	Cleaning Equipment Mfr
ProjectNumber:	Project #1
Substrates:	Textile
PartType:	Coupon
Contaminants:	Dirt
Cleaning Methods:	Manual Wipe
Analytical Methods:	Visual, 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 wasnot 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, length-wise 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. Cleaning calculated using the following formula:% Clean = Dc*100/Ds Where: Ds = unsoiled (initial) – Soil (dirty) Dc = Cleaned (clean) - Soil (dirty) Visual rankings: Rating 1 – 5; 1 bad, 5 good GREEN SEAL ENVIRONMENTAL STANDARD FOR INDUSTRIAL AND INSTITUTIONAL CLEANERS (GS-37) PRODUCT-SPECIFIC PERFORMANCE REQUIREMENTS Carpet Cleaners. The product shall have a pH between 3-10 and be tested following the requirements with an appropriate method as outlined in 3.2, Alternative Performance Requirements, for cleaning efficacy and resoiling resistance. Alternatively, products that have WoolSafe certification or a Carpet and Rug Institute Cleaning Solutions Seal of Approval, or equivalent, will be accepted. 3.2 Alternative Performance Requirements. Alternatively, using another objective, scientifically-validated method conducted under controlled and reproducible laboratory conditions, the product performs as well as or better than a conventional, nationally-recognized product in its category and at equivalent product-

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specific use directions. Test methodology and results must be documented in sufficient detail for this determination to be made.

Results:

Cleaning with the two supplied products resulted in the L values going down, meaning the surface got dirtier/darker. Only the Resolve carpet cleaner yielded improved cleaning when analyzing the L-values for the initial, dirty and cleaned readings. When comparing the products visually, the Resolve was again the top performer, followed this time by the General Purpose.

Light Meter								
Cleaner	Coupon	Initial	Dirty	Cleaned	U-S	C-S	Dc*100/ Ds	Average
Free Catholyte								
	A	64.59	54.33	57.6	10.26	3.27	31.87	-1.78
	B	64.31	56.35	54.97	7.96	-1.38	-17.34	
	C	63.14	56.7	55.42	6.44	-1.28	-19.88	
General Purpose								
	D	64.93	52.91	51.26	12.02	-1.65	-13.73	-38.31
	E	64.13	54.84	50.57	9.29	-4.27	-45.96	
	F	63.01	55.46	51.29	7.55	-4.17	-55.23	
Resolve								
	G	63.96	54.07	53.8	9.89	-0.27	-2.73	18.07
	H	63.83	54.3	57.91	9.53	3.61	37.88	
	I	64.8	52.32	54.7	12.48	2.38	19.07	

Final Visual Rating

Cleaner	Coupon	Rating
Free Catholyte	A	2.3
Free Catholyte	B	2.2
Free Catholyte	C	1.8
General Purpose	D	3.0
General Purpose	E	3.5
General Purpose	F	2.8
Resolve	G	3.5
Resolve	H	3.5
Resolve	I	3.7

Summary:

Substrates:	Textile				
Contaminants:	Dirt				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Annihilare	Free (Catholyte)	100	-1.70	☐	
Annihilare	Annihilyte General Purpose Cleaner	100	-38.31	☐	
Reckitt Benckiser	Resolve Spot and Stain Remover-Carpet Cleaner	100	18.07	☑	

Conclusion:

The Resolve had the highest L Value and and Resolve's overall visual rating are higher.