

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2015  
 DateRun: 04/12/2015  
 Experimenters: George Liang  
 ClientType: Cleaner Manufacturer  
 ProjectNumber: Project #2  
 Substrates: Textile  
 PartType: Coupon  
 Contaminants: Inks, Oil, Food  
 Cleaning Methods: Manual Wipe  
 Analytical Methods: Visual  
 Purpose: To evaluate supplied product for cloth stain cleaning.

Experimental Procedure: The purpose of this evaluation was to assess effectiveness of spot and stain removal chemicals by rating the removal of specific staining agents.

Eight almond white tufted cut pile test carpet measuring 18 inch by 24 inch were stained with eight staining agents for each cleaner. Two staining agent were applied to the test carpet in triplicate, spaced out at 2.5 inches. The staining agent was applied to the surface using a trigger pump spray bottle capable of delivering 2.5 +/- 0.5 ml of stain mixture. The spray was focused within a staining ring measuring 1.5 inches wide by 1.2 inches high.

The eight staining agents included mustard, catsup, coffee, grape juice, black permanent marker (2 1" lines instead of 2.5 ml), dirty motor oil, AATCC synthetic soil and chocolate syrup. These staining agents were used according to the dilution ratios listed in the table below.

- Staining Agent Dilution ratio
- Mustard 1:2 mustard:water
- Catsup 1:3 catsup:water
- Hot Coffee 60 deg +/-3C 1 teaspoon coffee to 175 ml water
- Purple Grape Juice Full concentration
- Black Permanent Marker N/A
- Dirty Motor Oil 1:1 oil:heptane\*
- AATCC Synthetic Soil 0.5 grams/100 ml water
- Chocolate Syrup 1:4 chocolate:water

\*heptane used in place of tetradecane

The staining agent mixture was poured into the spray bottle. The nozzle of the bottle was centered inside the staining ring and three pumps of the spray bottle were performed to deliver the 2.5 ml of mixture to the test carpet. The staining ring was left in place until the staining agent was completely soaked into the test carpet. The ring was rinsed in between each staining location. The two completed test carpets were allowed to dry for 24 hours +/- 2 hours before conducting the stain removal procedure.

Following the overnight drying, any excess solid staining agent was removed from the test carpet. The cleaning agent was applied to the surface so that the stain was saturated. The solution was allowed to sit on the stain for 2 minutes. The saturated stain was blotted with a clean dry Kimberly Clark Reinforced wiper towel for 30 times. Any transfer of the stain/cleaning agent to the towel was noted. At this point, the cleaning solution was applied to the surface and blotted until the stain was completely removed or three applications of the cleaning solution were performed. The total number of applications was recorded for each stain. The test carpet was allowed to sit for another 24 +/-2 hours to dry before evaluating the stains.

A minimum of three lab personnel were used to evaluate the stain removal efficacy which were then averaged together for the final rating. The evaluations were based on the following scale:

The evaluations were based on the following scale:

- Clean Rating Key
- 1 No Stain
- 2 Slight Stain
- 3 Noticeable Stain
- 4 Considerable Stain
- 5 Severe Stain

Chemistries Evaluated: DG-7 (20%), Stain Away

Results:

Light Analysis:					
Cleaner: DG-7 (20%)					
	Initial L	Dirty L	Final L	% Change	Ave %Change

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Mustard					
	66.76	61.94	66.09	-1	
	66.76	61.7	67.57	1.21	
	66.76	62.89	66.61	-0.22	0
Catsup					
	66.76	52.41	65	-2.64	
	66.76	57.05	59.71	-10.56	
	66.76	54.35	61.37	-8.07	-7.09
Hot Coffee					
	66.76	58.24	68.4	2.46	
	66.76	57.91	68.83	3.1	
	66.76	61.06	67.67	1.36	2.31
Grape Juice					
	66.76	55.47	69.79	4.54	
	66.76	59.19	68	1.86	
	66.76	65.35	69.48	4.07	3.49
Black Marker					
	66.76	21.17	39.15	-41.36	
	66.76	36.12	44.51	-33.33	
	66.76	32.49	34.77	-47.92	-40.87
Motor Oil					
	66.76	63.31	65.23	-2.29	
	66.76	58.86	66.54	-0.33	
	66.76	48.77	65.45	-1.96	-1.53
Synthetic Soil					
	66.76	28.81	35.81	-46.36	
	66.76	27.21	44.24	-33.73	
	66.76	21.55	45.73	-31.5	-37.2
Chocolate Syrup					
	66.76	48.57	57.58	-13.75	
	66.76	51.83	54.1	-18.96	
	66.76	50.33	56.4	-15.52	-16.08

### Second Cleaner

Cleaner:	Initial L	Dirty L	Final L	% Change	Ave %Change
Stain Away					
Mustard					
	66.76	63.51	65.35	-2.11	
	66.76	59.87	62.46	-6.44	
	66.76	53.74	62.2	-6.83	-5.13
Catsup					
	66.76	56.5	64.12	-3.95	
	66.76	52.28	62.17	-6.88	
	66.76	56.71	62.24	-6.77	-5.87
Hot Coffee					
	66.76	57.99	66.16	-0.9	
	66.76	60.76	66.94	0.27	
	66.76	59.91	61.85	-7.35	-2.66
Grape Juice					
	66.76	57.44	69.29	3.79	
	66.76	58.61	65.09	-2.5	
	66.76	57.5	70.34	5.36	2.22

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Black Marker					
	66.76	24.42	26.19	-60.77	
	66.76	30.39	31.93	-52.17	
	66.76	26.42	25.47	-61.85	-58.26
Motor Oil					
	66.76	67.44	70	4.85	
	66.76	60.69	65.92	-1.26	
	66.76	66.12	68.12	2.04	1.88
Synthetic Soil					
	66.76	35.93	57.77	-13.47	
	66.76	57.11	61.19	-8.34	
	66.76	51.23	51.82	-22.38	-14.73
Chocolate Syrup					
	66.76	49.73	64.98	-2.67	
	66.76	49.13	64.35	-3.61	
	66.76	46.01	63.17	-5.38	-3.88
Result of Visual Analysis:					
Cleaner: DG-7 (20%)					
	Clean Visual:	Ave Visual	Overall % Average Visual		
Mustard					
	3	4	4	3.7	
	3	4	4	3.7	
	3	3.5	3	3.2	3.5
Catsup					
	3	3	3	3	
	2	3	3	2.7	
	2	3	3	2.7	2.8
Hot Coffee					
	1	1.5	1.5	1.3	
	1	1	1	1	
	1	1	1	1	1.1
Grape Juice					
	1	1.5	1	1.2	
	1	1.5	1.5	1.3	
	1	1	1	1	1.2
Black Marker					
	5	5	5	5	
	5	4.5	4.5	4.7	
	5	4	4	4.3	4.7
Motor Oil					
	3	3	3.5	3.2	
	4	3	4	3.7	
	3	2.5	3	2.8	3.2
Synthetic Soil					
	4	4	3.5	3.8	
	4	3.5	4	3.8	
	5	4.5	4	4.5	4.1

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Chocolate Syrup					
	4	4.5	4.5	4.3	
	4	4.5	4	4.2	
	3	3	3	3	3.8

Visual

Cleaner:					
Stain Away					
	Clean Visual:		Ave Visual		Overall % Average Visual
Mustard					
	2	2.5	2	2.2	
	2	2.5	2.5	2.3	
	2	2	2	2	2.2
Catsup					
	1	2	2	1.7	
	2	2.5	2	2.2	
	1	2.5	2.5	2	1.9
Hot Coffee					
	1	1	1	1	
	1	1	1	1	
	1	1	1	1	1
Grape Juice					
	1	1	1	1	
	1	1.5	1	1.2	
	1	1	1	1	1.1
Black Marker					
	5	5	5	5	
	5	4.5	4.5	4.7	
	5	4.5	5	4.8	4.8
Motor Oil					
	2	1.5	2	1.8	
	2	1.5	1.5	1.7	
	3	1.5	2	2.2	1.9
Synthetic Soil					
	3	3	3	3	
	2	2.5	2	2.2	
	2	2	2	2	2.4
Chocolate Syrup					
	1	1.5	1	1.2	
	1	1.5	1.5	1.3	
	1	1.5	1.5	1.3	1.3

Summary:

<b>Substrates:</b>	Textile				
<b>Contaminants:</b>	Inks, Oil, Food				
<b>Company Name:</b>	<b>Product Name:</b>	<b>Conc.:</b>	<b>Efficiency:</b>	<b>Effective:</b>	<b>Observations:</b>
ProNatural Brands LLC	DG 7	20	0.00	<input checked="" type="checkbox"/>	
Foster & Smith	Stain Away	100	0.00	<input checked="" type="checkbox"/>	

Conclusion:

An effective cleaner is based on its %Light Average Change, a % change of less than 15% is considered to be an effective cleaner. A %Light Average Change is a comparison between the cleaned and initial values of the carpet's Light value change. A cleaner that has a value %change of less than 15% is considered to have gone back to its original state of the carpet (when it is not dirtied). An average visual change of 3 and higher is considered to be visually ineffective. Based on the standard %Light Average Change, the cleaner DG-7 at 20% dilution was not effective at removing black permanent marker, synthetic soil and chocolate syrup. The least visually effective stains being removed by cleaner DG-7 were mustard, black permanent marker, motor oil, synthetic soil and chocolate syrup. In addition to that cleaner Stain Away was only

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ineffective by both standards in removing black permanent marker. Overall cleaner Stain Away would be more effective at removing stains from carpets over DG-7 at a 20% dilution.