CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2017
DateRun:	06/18/2017
Experimenters:	George Liang, Vinh Tran
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #13
Substrates:	Carpet
PartType:	Coupon
Contaminants:	Inks, Dirt, Oil, Food
Cleaning Methods:	Manual Wipe
Analytical Methods:	Visual
Purpose:	To evaluate the effectiveness of spot and stain removal chemicals by rating the removal of specific staining agents.

Experimental Procedure:

Soiling Process:

A set of four almond white tufted test carpet were cut. Each carpet is measuring at 12 inch by 6.75 inches. The four pieces of carpet were stained with eight staining agents for each cleaner. The carpets were individually indented six times using a staining ring measuring 1.5 inches wide by 1.2 inches high. The indents were spaced out at 2.5 inches apart from one another. Two staining agents were applied to one test carpet in triplicate within the staining ring indents.

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:

Contaminants:

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 agents were applied directly onto three indented rings on one of the carpet by filling the inner rim of a 125 mL bottle cap with the same staining agents in triplicates. The staining ring was left in place until the staining agent was completely soaked into the test carpet. The stain was then manually applied around the staining ring indent using a hand held swab. A new ring was used for each staining agent. After staining all the carpets with a staining agent, the contaminated test carpets were allowed to dry for 24 hours (+/- two hours) before conducting the stain removal procedure.

Cleaning Process:

Following the overnight drying, any excess solid staining agent was removed from the test carpet. The cleaning aerosol cans were shaken before use. A total of three full sprays of the cleaning agent was applied directly onto the surface so that each stain was saturated. The solution was allowed to sit on the stain for three to five minutes. Each 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.

Efficacy Rating Process:

The test carpet was allowed to sit for another 24 (+/- two hours) to dry before evaluating the stains. A minimum of three lab personnel were used to evaluate the stain removal efficacy from each staining ring and was then averaged together for a final rating. The evaluations were based on the following scale:

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Clean Rating Key:

#	Description
1	No Stain

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2	Slight Stain
3	Noticeable Stain
4	Considerable Stain
5	Severe Stain

Results:

Both cleaners were the most effective in removing hot coffee, grape juice, and motor oil stains from the carpets. Both cleaners are observed to have an overall visual cleanliness rating of 1.7 in removing hot coffee. The new sample cleaner was not significantly more effective in removing grape juice stain from the carpet as compared to the old sample cleaner; with respective visual ratings of 1.4 and 1.6. In addition, both cleaners have the same visual cleanliness ratings of 1.2 in removing motor oil stains.

The hardest stains to remove are mustard, catsup, synthetic carpet soil, chocolate syrup, and permanent ink marker. Both cleaners were observed to be slightly effective in removing mustard, catsup, synthetic carpet soil, and chocolate syrup stains. However, both cleaners were not effective in removing permanent marker stains from the carpet; the new sample cleaner had a visual cleanliness of 4.8, and the old sample cleaner had a visual cleanliness of 4.9.

Cleaner: Old Sample					
Soil Type	Clean Visual Rating:			Avg. Clean Visual	Overall Avg. Clean Visual
Mustard	3.5	4.0	4.0	3.8	3.7
	3.0	4.0	4.0	3.7	
	3.0	4.0	4.0	3.7	
Catsup	2.0	1.5	2.0	1.8	2.7
	3.0	1.5	2.0	2.2	
	4.0	4.0	4.0	4.0	
Hot Coffee	1.5	1.5	1.0	1.3	1.7
	1.5	1.5	2.0	1.7	
	2.0	2.0	2.0	2.0	
Grape Juice	1.0	1.5	1.5	1.3	1.6
	1.5	1.5	1.5	1.5	
	2.0	2.0	2.0	2.0	
Black Marker	5.0	5.0	5.0	5.0	4.9
	4.5	5.0	5.0	4.8	
	5.0	5.0	5.0	5.0	
Motor Oil	1.0	1.5	1.0	1.2	1.2
	1.0	1.0	1.0	1.0	
	1.5	1.5	1.5	1.5	
Synthetic Soil	2.5	2.0	2.0	2.2	3.3
	3.5	2.0	2.5	2.7	
	5.0	5.0	5.0	5.0	
Chocolate Syrup	2.0	2.0	2.5	2.2	2.8
	3.0	3.5	3.5	3.3	
	3.0	3.0	3.0	3.0	

Cleaner: New Sample					
Soil Type	Clean Visual Rating:			Avg. Clean Visual	Overall Avg. Clean Visual
Mustard	4.0	4.5	4.5	4.3	4.2
	3.5	4.0	3.5	3.7	
	4.5	4.5	4.5	4.5	
Catsup	2.5	2.5	2.5	2.5	3.0
	2.0	1.5	2.5	2.0	
	4.5	4.5	4.5	4.5	
Hot Coffee	1.5	1.0	1.0	1.2	1.7
	2.0	2.0	2.0	2.0	
	2.0	2.0	2.0	2.0	
Grape Juice	1.0	1.0	1.5	1.2	1.4
	1.0	1.0	1.0	1.0	
	2.0	2.0	2.0	2.0	
	5.0	5.0	4.5	4.8	4.8

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Black Marker	5.0	5.0	4.0	4.7	
	5.0	5.0	5.0	5.0	
Motor Oil	1.0	1.0	1.0	1.0	1.2
	1.0	1.0	1.0	1.0	
	1.5	1.5	1.5	1.5	
Synthetic Soil	3.0	2.5	2.5	2.7	3.5
	4.0	3.5	2.5	3.3	
	4.5	4.5	4.5	4.5	
Chocolate Syrup	3.0	2.5	2.0	2.5	3.1
	2.5	2.0	2.0	2.2	
	4.5	4.5	4.5	4.5	

Contaminant: Mustard		
Product Name	Conc.	Visual Rating
Old Sample	RTU	3.7
New Sample		4.2
Contaminant: Catsup		
Product Name	Conc.	Visual Rating
Old Sample	RTU	2.7
New Sample		3.0
Contaminant: Hot Coffee		
Product Name	Conc.	Visual Rating
Old Sample	RTU	1.7
New Sample		1.7
Contaminant: Grape Juice		
Product Name	Conc.	Visual Rating
Old Sample	RTU	1.6
New Sample		1.4
Contaminant: Black Permanent Marker		
Product Name	Conc.	Visual Rating
Old Sample	RTU	4.9
New Sample		4.8
Contaminant: Motor Oil		
Product Name	Conc.	Visual Rating
Old Sample	RTU	1.2
New Sample		1.2
Contaminant: Synthetic Soil		
Product Name	Conc.	Visual Rating
Old Sample	RTU	3.3
New Sample		3.5
Contaminant: Chocolate Syrup		
Product Name	Conc.	Visual Rating
Old Sample	RTU	2.8
New Sample		3.1

Summary:

Substrates:	Carpet				
Contaminants:	Inks, Dirt, Oil, Food				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Fisher Scientific	Absolute Ethanol	100	0.00	☑	
Fisher Scientific	Absolute Ethanol	0	0.00	☐	
Fisher Scientific	Absolute Ethanol	0	0.00	☐	
Brand Buzz	Shout Carpet Cleaner (Old Sample)	100	0.00	☑	
Brand Buzz	Shout Carpet Cleaner (New Sample)	100	0.00	☑	

Conclusion: Shout Carpet Cleaner New Sample is just as effective as Shout Carpet Cleaner Old Sample at removing staining agents from carpet.