CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2015
DateRun:	07/26/2015
Experimenters:	Loc Nguyen, George Liang, Luis Raudales
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #1
Substrates:	Liquid
PartType:	Coupon
Contaminants:	Odor
Cleaning Methods:	Low Pressure Spray
Analytical Methods:	Smell
Purpose:	To evaluate supplied products for malodor elimination
Experimental Procedure:	Clean carpet was cut into sixteen 2 in x 4 in rectangular strips. A panel of three then examined the odors to determine the baseline values using seven bottles, including a control. These strips were placed into glass bottles and the cat urine was directly applied to the carpet to determine baseline dirty odor characteristics. Each panelist was asked to describe the odor and rank the level of intensity of the malodor. After the panelists observed the initial odors, bottles were recapped and allowed to sit overnight for three days. After aging the contaminated carpets, each bottle was subjected to rounds of cleaning agent treatments and each panelist was used to assess malodor levels after each cycle of treatment. Treatments of contaminated bottles are stopped after the 3rd cycle of treatment. An effective cleaner will have a malodor level of under 2 after the 3rd round of treatment. The ranking of malodor level is as follows: 1 being close to no smell of malodor to 5 being the worse malodor level. Then the malodor was allowed to sit overnight to determine if there was any change of malodor levels. If there is a high increase in malodor level that results in a malodor level of 2 and higher; an additional spray of treatment is applied onto the carpet to see if the cleaning agent can eliminate the increased malodor from the overnight sit. Chemistries Evaluated: Good Riddance; E-50; Wurth Eco Odour Eliminator (Kiwi Mango); Febreze; Wurth Odor Eliminator (Spring Scent)

Results:

Cleaner	Good Riddance	Original		Average
Bottle 1	3.8	4	4.5	4.1
Bottle 2	3.5	3.5	3.5	3.5
Bottle 3	4	4	4	4
	% Average: 3.9			
Cleaner	Good Riddance	Sprays: 2		Average
Bottle 1	3.5	3	3.5	3.3
Bottle 2	3	3	3	3
Bottle 3	4	3	3	3.3
	% Average: 3.2			
Cleaner	Good Riddance	Sprays: 4		Average
Bottle 1	2	2.5	2	2.2
Bottle 2	1.5	2.5	2	2
Bottle 3	1.1	2	2	1.7
	% Average: 2.0			
Cleaner	Good Riddance	Sprays: 6		Average
Bottle 1	1	2.5	2	1.8
	1.2	2	1.5	1.6

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Bottle 2				
Bottle 3	1	2	2	1.7
	% Average: 1.7			
Cleaner	E-50	Original		Average
Bottle 1	3.8	4	3	3.6
Bottle 2	3.8	4	4	3.9
Bottle 3	4	4	4	4
	% Average: 3.8			
Cleaner	E-50	Sprays: 2		Average
Bottle 1	2	2	3	2.3
Bottle 2	2.5	2	2.5	2.3
Bottle 3	2.5	2	2.5	2.3
	% Average: 2.3			
Cleaner	E-50	Sprays: 4		Average
Bottle 1	1	1	2	1.3
Bottle 2	1	2	1.5	1.5
Bottle 3	1	1	1.5	1.2
	% Average: 1.3			
Cleaner	E-50	Sprays: 6		Average
Bottle 1	1	1	1.5	1.2
Bottle 2	1.2	1.5	1	1.2
Bottle 3	1.5	1	1.5	1.3
	% Average: 1.2			
Cleaner	Eco Odour Eliminator (Kiwi Mango)	Original		Average
Bottle 1	4	4	4	4
Bottle 2	3.8	3.5	3	3.4
Bottle 3	4	4	4	4
	% Average: 3.8			
Cleaner	Eco Odour Eliminator (Kiwi Mango)	Sprays: 2		Average
Bottle 1	2	2	3	2.3
Bottle 2	1.5	1.5	2.5	1.8
Bottle 3	2.5	2	2	2.2
	% Average: 2.1			
Cleaner	Eco Odour Eliminator (Kiwi Mango)	Sprays: 4		Average
Bottle 1	1.5	2	1.5	1.7

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Bottle 2	2	1.2	1	1.4
Bottle 3	1.5	1.5	1	1.3
	% Average: 1.5			
Cleaner	Eco Odour Eliminator (Kiwi Mango) Sprays: 6	Average		Average
Bottle 1	1.2	2	1	1.4
Bottle 2	1.2	1.2	1	1.1
Bottle 3	1.2	1	1	1.1
	% Average: 1.2			
Cleaner	Febreze	Original		Average
Bottle 1	4	4	4	4
Bottle 2	3	3	3.5	3.2
Bottle 3	4	4	4	4
	% Average: 3.7			
Cleaner	Febreze	Sprays: 2		Average
Bottle 1	2	2.5	3.5	2.7
Bottle 2	1.5	1.5	2	1.7
Bottle 3	2	2	1.5	1.8
	% Average: 2.1			
Cleaner	Febreze	Sprays: 4		Average
Bottle 1	1.5	2	3.5	2.3
Bottle 2	1.5	1.5	2	1.7
Bottle 3	2	1.5	1.5	1.7
	% Average: 1.9			
Cleaner	Febreze	Sprays: 6		Average
Bottle 1	1.2	1.5	1.5	1.4
Bottle 2	1	1.5	1	1.2
Bottle 3	1	1.5	1	1.2
	% Average: 1.2			
Cleaner	Odor Eliminator (Spring Scent)	Original		Average
Bottle 1	5	5	4.5	4.8
Bottle 2	4	4	4	4
Bottle 3	4.2	4	4	4.1
	% Average: 4.3			
Cleaner	Odor Eliminator (Spring Scent)	Sprays: 2		Average
Bottle 1	1.5	2	2	1.8

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Bottle 2	2	2	2.5	2.2
Bottle 3	1.5	2	2.5	2
	% Average: 2.0			
Cleaner	Odor Eliminator (Spring Scent)	Sprays: 4		Average
Bottle 1	1.1	1.5	1	1.2
Bottle 2	1	1.5	1.5	1.3
Bottle 3	1.1	1.5	1	1.2
	% Average: 1.2			
Cleaner	Odor Eliminator (Spring Scent)	Sprays: 6		Average
Bottle 1	1	1	1	1
Bottle 2	2	1	1	1.3
Bottle 3	1.1	1.2	1	1.1
	% Average: 1.1			

Summary Table		
Cleaner	Sprays	% Average
Good Riddance	6	1.7
E-50	4	1.3
Eco Odour Eliminator	4	1.5
Febreze	4	1.9
Odor Eliminator (Spring Scent)	4	1.2

Cleaner	Good Riddance	Overnight		Average
Bottle 1	2	3	1.5	2.2
Bottle 2	2	3	2.5	2.5
Bottle 3	2.5	2.5	2.5	2.5
	% Average: 2.4			
Cleaner	Good Riddance Sprays: 2	Overnight		Average
Bottle 1	1	3	2	2
Bottle 2	1.5	2	1.5	1.7
Bottle 3	1.5	2	1	1.5
	% Average: 1.7			
Cleaner	E-50	Overnight		Average
Bottle 1	1	2	2	1.7
Bottle 2	2	2	1	1.7
Bottle 3	1.5	1	1.5	1.3
	% Average: 1.6			
Cleaner	Eco Odour Eliminator (Kiwi Mango)	Overnight		Average
Bottle 1	2	2.5	3	2.5
Bottle 2	3	2.5	2	2.5
Bottle 3	2.5	2	2	2.2
	% Average: 2.4			
Cleaner	Eco Odour Eliminator (Kiwi Mango) Sprays: 2	Overnight		Average
Bottle 1	1.5	1.5	1.5	1.5
Bottle 2	2	2	1	1.7
Bottle 3	2	1.5	1.5	1.7
	% Average: 1.6			
Cleaner	Febreze	Overnight		Average
Bottle 1	1.5	2	1.5	1.7
Bottle 2	1.5	1.5	1.5	1.5
Bottle 3	2	2	1	1.7
	% Average: 1.6			

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Cleaner	Odor Eliminator (Spring Scent)	Overnight		Average
Bottle 1	2	1.5	1.5	1.7
Bottle 2	1.5	1.5	1	1.3
Bottle 3	1.2	1.5	1	1.2
	% Average: 1.4			

Overnight Summary Table		
Cleaner	Overnight Avg.	After Spray
Good Riddance	2.4	1.7
E-50	1.6	N/A
Eco Odour Eliminator (Kiwi Mango)	2.4	1.6
Febreze	1.6	N/A
Odor Eliminator (Spring Scent)	1.4	N/A

Summary:

Substrates:	Liquid				
Contaminants:	Odor				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Maxim Technologies Inc.	Good Riddance Odor control	100	0.00	☑	Effective at reducing malodor level
Fisher Scientific	Absolute Ethanol	0	0.00	☐	
EcoLogic Solutions, Inc.	Deodorizing Cleaner E-50	100	0.00	☑	Effective at reducing malodor level
Wurth	Eco Odour Eliminator Kiwi-Mango	100	0.00	☑	Effective at reducing malodor level
Procter & Gamble	Febreze Free Nature	100	0.00	☑	Effective at reducing malodor level
Wurth	Odor Eliminator	100	0.00	☑	Effective at reducing malodor level

Conclusion:

A cleaner is considered effective once it has reached a malodor level that is under 2 within 3 cycles of treatment. Cleaning agents E-50, Eco Odour Eliminator (Kiwi Mango), Febreze and Odor Eliminator (Spring Scent) all had reached a malodor level that was under 2 after its second cycle of treatment. Noticeably Odor Eliminator (Spring Scent) had the lowest malodor level of 1.2 after 2 rounds of treatment. Whereas cleaning agent Good Riddance took 3 cycles of treatment to reach a malodor level that was under 2; with a rating of 1.7.

After an overnight sit, cleaning agents E-50, Febreze and Odor Eliminator (Spring Scent) did not require a second round of treatment because it did not have an overall significant rise in malodor level from the overnight sit. However, bottles treated with cleaning gent Good Riddance and Eco Odour Eliminator (Kiwi Mango) did need a second round of treatment. Eco Odour Eliminator (Kiwi Mango) had a 0.2 higher rise in malodor level compared to Good Riddance treated bottles from the overnight sit. Although, both cleaning agents did remove the malodor level from the overnight sit after the second treatment.

Overall, the most effective cleaning agent at removing malodor level would be as follows: Odor Eliminator (Spring Scent), E-50, Febreze, Eco Odor Eliminator (Kiwi Mango) and Good Riddance.