CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2010
DateRun:	06/10/2010
Experimenters:	Jason Marshall, Junhee Cho, Timothy Weil
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #1
Substrates:	Glass/Quartz
PartType:	Coupon
Contaminants:	Food
Cleaning Methods:	Low Pressure Spray
Analytical Methods:	Visual
Purpose:	To evaluate supplied product against a traditional automatic dishwashing liquid.

Experimental Procedure:

This test method covers a procedure for measuring performance of a mechanical dishwashing detergent in terms of the buildup of spots and film on glassware. It is designed to evaluate household automatic dishwasher detergents during this cleaning procedure. Glass tumblers and juice glasses were washed in a mechanical dishwasher in the presence of food soil to evaluate the levels of spotting and filming allowed by the detergents under test were compared visually.
This test method is intended as a laboratory screening test to determine performance of the detergent under real world use conditions, but will not necessarily predict performance under all end-use conditions. Tableware used was as follows: 10-in. diameter Dinner plates (6), 6-in. diameter Cereal Bowls (2), and stainless steel Cutlery. Six 10-in dinner plates, two 6-in. diameter Cereal Bowls, six knives, six forks, and six spoons were used. These pieces were all placed on the lower rack of the dishwasher. Eight 8 oz tumblers and six 12 oz juice glasses are loaded on the top rack.

Standard Food Soil Components: nonfat powdered milk, margarine, and wheat-based cooked cereal (optional). Standard Food Soil Preparation: A mixture of 80 weight % of margarine and 20 weight % of powdered milk is prepared. The margarine was warmed until fluid and the powdered milk was mixed thoroughly. A total of 40 g of food soil was distributed onto the six dinner plates, using a hand held swab. The VWR International Under-counter Glassware Washer (model 82020-922) was loaded as follows: In the lower (plate) rack, distribute the six soiled dinner plates uniformly with bowls placed in the center, aligned with the silverware. In the upper (glass) rack, distribute the glass tumblers evenly. The eight glasses were placed along each side, four to a side. See photos below. Maintain a water temperature of 130°F (54 °C) in the dishwasher.

Detergent Concentration—Use the quantity of detergent specified by the manufacturer in the provided concentrations. For a thorough investigation, evaluate at over and under usage.
Rating: The tumblers were visually inspected after each cycle for film and spotting. Evaluations were based on the following scale.
Rating Spotting Filming
1 no spots none
2 spots at random barely perceptible
3 about 1/4 of surface covered slight
4 about 1/2 of surface covered moderate
5 virtually completely covered heavy
Obtain number ratings by averaging the ratings for individual tumblers, keeping spotting and filming results separate.

Alpha Liquid Machine Detergent (ALMD) was used as the dishwashing liquid when evaluating the rinse/ drying aids. One set of trials was conducted using the supplied cleaner without rinse aid and the remaining trials used drying agents in combination with the provided dishwashing detergent.

Results:

The ALDM product had the most spotting and film ratings when used in conjunction with no drying agent. The supplied product, ALDM, cleaned better with the rinse aids with all alternative drying agents having lower spotting ratings than the conventional product. The film rating was higher without the rinse aids. Trials with the supplied products resulted in ratings that averaged lower than with the conventional product- spots at random and barely perceptible filming.

Glass #	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Trial 11	Trial 12
Glass Tumblers Spotting												
1	4	1	1	1	1	1	1	1	1	1	1	
2	2	5	2	1	1	1	1	1	1	1	1	1
3	4	5	2	1	1	1	1	1	1	1	1	1
4	1	5	2	1	1	1	1	1	1	2	1	1
5	1	4	3	1	1	1	1	1	1	1	1	1
6	1	4	3	1	1	1	1	1	1	1	1	1

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7	2	5	1	1	1	1	1	1	1	1	1	1
8	2	5	2	1	1	1	1	1	1	2	1	1
tumbler ave	1.75	4.6	2	1	1	1	1	1	1	1.25	1	1
Juice Glass												
1	4	5	3	1	1	1	1	1	1	1	1	1
2	5	5	4	1	1	1	1	1	1	1	1	1
3	3	4	4	1	1	1	1	1	1	1	1	1
4	3	5	3	1	1	1	1	1	1	1	1	1
5	4	4	2	1	1	1	1	1	1	1	1	1
6	2	5	3	1	1	1	1	1	1	1	1	1
Juice glass ave	3.5	4.7	3.2	1	1	1	1	1	1	1	1	1
Trial ave			3.8			1			1			1

Filming

Glass Tumblers	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Trial 11	Trial 12
1	2	4	2	3	3	2	2	2	2	3	3	2
2	2	4	3	2	3	3	2	2	2	2	2	2
3	5	4	2	2	3	3	2	2	2	2	2	1
4	3	3	3	3	3	3	2	2	2	2	3	2
5	2	4	2	2	2	2	2	2	2	2	2	2
6	2	4	2	2	3	2	2	2	2	2	2	2
7	3	3	2	2	2	2	2	2	2	2	3	2
8	4	3	2	2	2	3	2	2	2	1	3	1
tumbler ave	2.9	3.6	2.3	2.3	2.6	2.5	2	2	2	2	2.5	1.8
Juice glass												
1	4	5	4	3	2	3	2	2	2	3	3	2
2	4	5	5	2	2	3	3	3	2	2	3	2
3	4	4	4	3	3	3	3	2	3	3	2	2
4	4	4	4	2	3	2	2	3	2	2	2	2
5	5	5	4	3	2	3	2	3	2	2	2	2
6	5	4	5	3	3	3	2	2	2	3	3	3
Juice glass ave	4.3	4.5	4.3	2.7	2.5	2.8	2.3	2.5	2.2	2.5	2.5	2.2
Trial ave			4.4			2.7			2.3			2.4

Note: Trial 1-3= ALMD, Trial 4-6= ALMD + Jetdry, Trial 7-9= ALMD & Alpha Chem Dry, Trial 10-12= Alpha Chemical Broken Dish (no ALMD)

Summary:

Substrates:	Glass/Quartz				
Contaminants:	Food				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Alpha Chemical Services	Liquid Machine Dishwasher	0.1	0.00	☑	

Conclusion:

Based on comparing the supplied product and rinse aid against the traditional automatic dishwashing product, the product performed slightly better for both spotting and filming. Overall cleaning using the supplied rating system resulted in effective cleaning.