

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2018  
 DateRun: 08/10/2018  
 Experimenters: Vinh Tran, Justin Rainaud, Othon Pagounes, Ted Kearney  
 ClientType: Cleaner Manufacturer  
 ProjectNumber: Project #3  
 Substrates: Ceramics, Glass/Quartz  
 PartType: Coupon  
 Contaminants: Food  
 Cleaning Methods: Mechanical Agitation  
 Analytical Methods: Visual  
 Purpose: To evaluate the effectiveness of the AGAE Dishwasher Gel against Cascade Complete Dishwasher Gel and Seventh Generation Dishwasher Gel on the removal of Food Soil from ceramic plates and glassware by automatic dishwashing.

Experimental Procedure: All ceramic plates and glassware were previously cleaned and dried when 40 g of Soil DCC 05A Food (80% Margarine and 20% Non-Fat Powdered Milk) was evenly distributed onto six plates. The mechanical dishwasher was running previously to increase the temperature to 75° F, for the testing. The six soiled plates were placed on the lower rack uniformly, and six tall glass tumblers and four small glass tumblers were placed uniformly on the upper rack. The detergent slot was filled with the respective dishwasher gel and the test was then run for 42 minutes. After the cycle was completed the six tall glass tumblers and the four small glass tumblers were removed and inspected for spotting and filming by three examiners, and placed in their exact former locations. The six ceramic plates were re-soiled to the initial soil amount of 6.66 g and also placed in their former locations. The process was repeated five times for each dishwasher gel.

The following rating system was used:

Rating	Spotting	Filming
1	No Spots	None
2	Spots and Random	Barely
3	About ¼ of Surface Covered	Slight
4	About ½ of Surface Covered	Moderate
5	Virtually Completely Covered	Heavy

Results:

### AGAE Dishwasher Gel

Cycle 1	Tall Glass	Glass Number	Spotting Rating			Filming Rating			Average Spotting	Average Filming
			Examiner 1	Examiner 2	Examiner 3	Examiner 1	Examiner 2	Examiner 3		
		1	4.5	4	4	4	3.5	4	2.89	3.89
		2	2	3	3.5	5	3	3		
		3	2	2.5	3	4.5	4	4		
		4	2	4	3	3.5	3	3		
		5	2.5	2	3	5	3.5	4		
		6	2	2.5	2.5	5	4	4		
	Small Glass	1	2	1.5	3	2	2	3	2.54	2.63
		2	2	3	2.5	2	2	3		
		3	2.5	3.5	3	2	4	3		
		4	3	2	2.5	2.5	3	3		

Cycle 2	Tall Glass	Glass Number	Spotting Rating			Filming Rating			Average Spotting	Average Filming
			Examiner 1	Examiner 2	Examiner 3	Examiner 1	Examiner 2	Examiner 3		
		1	4.5	4	3.5	4	3.5	3.5	3.58	3.53
		2	3.5	4	4	4.5	3	3.5		
		3	4	3	4	4.5	5	4		

# CLEANING LABORATORY EVALUATION SUMMARY

		4	3	3	3	2.5	4	3		
		5	5	4.5	4	2.5	3.5	4		
		6	2	3	2.5	2	3	3.5	3.50	3.50
	Small Glass	1	2.5	3.5	2.5	4	4	3.5		
		2	3	4	3	4.5	3.5	3.5		
		3	5	4.5	4	3	3.5	3		
		4	2	4	4	2	4	3.5		

Cycle 3	Tall Glass	Glass Number	Spotting Rating			Filming Rating			Average Spotting	Average Filming
			Examiner 1	Examiner 2	Examiner 3	Examiner 1	Examiner 2	Examiner 3		
									3.67	3.81
		1	3	3.5	3.5	4	3.5	2.5		
		2	4	4	4	4	3.5	4		
		3	2	3.5	2.5	5	4	3.5		
		4	4	4	3.5	3	3.5	3		
		5	4.5	5	4	3.5	5	4.5		
		6	4	4	3	4.5	4	3.5	4.42	3.96
	Small Glass	1	4	4.5	4	3	4	4		
		2	3	4	3.5	3	4.5	4		
		3	5	5	5	5	4.5	4		
		4	5	5	5	3	4.5	4		

Cycle 4	Tall Glass	Glass Number	Spotting Rating			Filming Rating			Average Spotting	Average Filming
			Examiner 1	Examiner 2	Examiner 3	Examiner 1	Examiner 2	Examiner 3		
									3.97	3.25
		1	3.5	4	4	3	3	2.5		
		2	5	4.5	4	4.5	3	3.5		
		3	3.5	3.5	3.5	3	2	3		
		4	4	4.5	3.5	3	3	3		
		5	4	3.5	4.5	3.5	4	4.5		
		6	4.5	3.5	4	4.5	2.5	3	4.13	3.17
	Small Glass	1	5	4.5	4.5	3	4	4.5		
		2	2	4	4.5	2	3.5	3		
		3	5	4	3.5	3	3.5	3		
		4	4	4.5	4	3	3	2.5		

Cycle 5	Tall Glass	Glass Number	Spotting Rating			Filming Rating			Average Spotting	Average Filming
			Examiner 1	Examiner 2	Examiner 3	Examiner 1	Examiner 2	Examiner 3		
									3.83	3.25
		1	3.5	3	3	3	3.5	2.5		
		2	3	3.5	4	2.5	3.5	3.5		
		3	4	4	4	3	3.5	4		
		4	4	4	3.5	4	2.5	2.5		
		5	4	4	4	4.5	2.5	3		
		6	5	4.5	4	4	3.5	3	4.38	3.67
	Small Glass	1	5	4.5	4	4.5	3	3		
		2	5	4	4	5	2.5	3		
		3	4.5	5	4.5	4	3.5	3.5		
		4	4.5	4	3.5	4	4	4		

**Cascade Complete Dishwasher Gel**

Cycle 1	Tall Glass	Glass Number	Spotting Rating			Filming Rating			Average Spotting	Average Filming
			Examiner 1	Examiner 2	Examiner 3	Examiner 1	Examiner 2	Examiner 3		
									2.36	1.94

# CLEANING LABORATORY EVALUATION SUMMARY

		1	2	2.5	2	2	1.5	2		
		2	3	2.5	2	2	2	2		
		3	2	3	3	1.5	2	2.5		
		4	2	2.5	2	2	1.5	2		
		5	2.5	2.5	3	2	2	2		
		6	3	1.5	1.5	2	1.5	2.5	2.33	2.29
	Small Glass	1	2.5	2.5	2	1.5	1.5	2		
		2	3	2	1.5	3.5	3	2		
		3	3.5	3	2	3.5	3	2.5		
		4	2.5	2	1.5	2	1.5	1.5		

Cycle 2	Tall Glass	Glass Number	Spotting Rating			Filming Rating			Average Spotting	Average Filming
			Examiner 1	Examiner 2	Examiner 3	Examiner 1	Examiner 2	Examiner 3		
									2.58	1.83
		1	2	2	1.5	2	2	1.5		
		2	3	2.5	2	3	2	2		
		3	3.5	3	2	2	2	1.5		
		4	3	3	2.5	2	1.5	1.5		
		5	3.5	3.5	3	2	1.5	1.5		
		6	2.5	2	2	2	1.5	1.5	2.96	1.92
	Small Glass	1	2	2	2.5	1.5	1.5	2		
		2	2.5	3	2.5	2	1.5	1.5		
		3	4.5	3.5	3	3	2	2		
		4	4	3.5	2.5	2	2	2		

Cycle 3	Tall Glass	Glass Number	Spotting Rating			Filming Rating			Average Spotting	Average Filming
			Examiner 1	Examiner 2	Examiner 3	Examiner 1	Examiner 2	Examiner 3		
									2.42	2.03
		1	2	2	2	2.5	2	1.5		
		2	2.5	2.5	2	2	2.5	2.5		
		3	2.5	2	1.5	2.5	1.5	1.5		
		4	3	2.5	2	3	2	1.5		
		5	3	3	2.5	2	2	2		
		6	3	2.5	3	1.5	1.5	2.5	3.54	2.42
	Small Glass	1	4	3.5	3.5	3	2	2.5		
		2	4	2	2.5	3	2.5	2.5		
		3	4.5	4	4	2.5	2	2.5		
		4	4	3.5	3	2	2.5	2		

Cycle 4	Tall Glass	Glass Number	Spotting Rating			Filming Rating			Average Spotting	Average Filming
			Examiner 1	Examiner 2	Examiner 3	Examiner 1	Examiner 2	Examiner 3		
									2.39	1.94
		1	3	2	1.5	2	2	1.5		
		2	2	2	1.5	2	3	2		
		3	3.5	2.5	2	2	1.5	1.5		
		4	3	3.5	3	2	2	2		
		5	3	2.5	2.5	2	2.5	2		
		6	2	1.5	2	2	1.5	1.5	3.67	2.50
	Small Glass	1	4	3.5	3	2	3	2.5		
		2	3.5	2	2.5	2.5	2	2		
		3	4	4	3.5	2.5	2.5	2.5		
		4	4.5	5	4.5	2.5	3	3		

# CLEANING LABORATORY EVALUATION SUMMARY

Cycle 5	Tall Glass	Glass Number	Spotting Rating			Filming Rating			Average Spotting	Average Filming
			Examiner 1	Examiner 2	Examiner 3	Examiner 1	Examiner 2	Examiner 3		
								2.67	1.97	
		1	3	2.5	1.5	2	2	1.5		
		2	3.5	1.5	2	2	2	2		
		3	2.5	2.5	2	2	2	1.5		
		4	3	3	2.5	2	1.5	2		
		5	4	3.5	3	2	2.5	2.5		
		6	3	3	2	2	2	2		
	Small Glass	1	3.5	4	3.5	2	2	2	3.50	2.63
		2	4	2	2	2	2	1.5		
		3	3.5	3	3.5	2	2.5	2		
		4	5	4	4	2	3	2.5		

### Seventh Generation Dishwasher Gel

Cycle 1	Tall Glass	Glass Number	Spotting Rating			Filming Rating			Average Spotting	Average Filming
			Examiner 1	Examiner 2	Examiner 3	Examiner 1	Examiner 2	Examiner 3		
								2.83	2.31	
		1	3	2.5	2	1.5	2	2		
		2	3.5	3	2	2	2.5	3		
		3	4	3	2.5	3	3	2.5		
		4	3.5	2.5	2.5	2	2	2		
		5	3.5	2	2	2	2	3		
		6	4	3	2.5	2	2	3		
	Small Glass	1	2.5	3	2	2	1.5	2	3.21	1.92
		2	4	4	2.5	2	2	2.5		
		3	4.5	3.5	3.5	1.5	2	2		
		4	3	3	3	2	1.5	2		

Cycle 2	Tall Glass	Glass Number	Spotting Rating			Filming Rating			Average Spotting	Average Filming
			Examiner 1	Examiner 2	Examiner 3	Examiner 1	Examiner 2	Examiner 3		
								2.94	2.00	
		1	2.5	2.5	2.5	2	2	1.5		
		2	3	3.5	2.5	2	1.5	1.5		
		3	3	3	3	2	2	2		
		4	3.5	3.5	3	2	2.5	2		
		5	3	3	2.5	2	2.5	2.5		
		6	3.5	2.5	3	2	2	2		
	Small Glass	1	4	3	3	2.5	1.5	1.5	3.79	2.08
		2	3	4	3.5	2	2	1.5		
		3	5	4	4	2.5	2	2.5		
		4	4	4	4	2	2.5	2.5		

Cycle 3	Tall Glass	Glass Number	Spotting Rating			Filming Rating			Average Spotting	Average Filming
			Examiner 1	Examiner 2	Examiner 3	Examiner 1	Examiner 2	Examiner 3		
								3.28	2.42	
		1	2	3	2	2	2	2		
		2	4	3.5	3	2	3	2.5		
		3	4	3	3	2	2.5	2.5		
		4	3.5	3.5	3	2	2	2		
		5	4	3.5	3	2.5	3	2.5		
		6	4.5	3.5	3	3	3.5	2.5		
	Small Glass	1	3.5	4	3.5	2.5	2	2.5	3.88	2.13
		2	4	4	3.5	2	1.5	1.5		

# CLEANING LABORATORY EVALUATION SUMMARY

		3	4	4	4	3	2.5	2.5	
		4	4	4	4	2	2	1.5	

Cycle 4	Tall Glass	Glass Number	Spotting Rating			Filming Rating			Average Spotting	Average Filming
			Examiner 1	Examiner 2	Examiner 3	Examiner 1	Examiner 2	Examiner 3		
			3	3.5	2.5	2	2	2	3.67	2.31
		1	4	3	2.5	2	2	2		
		2	4.5	4	3.5	3	2.5	3		
		3	4	4	4	2	3	2.5		
		4	4	3.5	3.5	2	2	2.5		
		5	4.5	4	4	2.5	2	2.5		
	Small Glass	1	5	4	4	2	2	2	4.29	2.13
		2	4.5	3.5	3.5	2	2	2.5		
		3	5	4.5	4.5	1.5	2.5	2.5		
		4	5	4	4	3	2	1.5		

Cycle 5	Tall Glass	Glass Number	Spotting Rating			Filming Rating			Average Spotting	Average Filming
			Examiner 1	Examiner 2	Examiner 3	Examiner 1	Examiner 2	Examiner 3		
			3	3.5	2.5	2	2	2	3.36	2.17
		1	3.5	2.5	2.5	2	2.5	2		
		2	4	3	2.5	2	2	2.5		
		3	4	3.5	3.5	2	2	2.5		
		4	3.5	4	3.5	1.5	2	3		
		5	4	4	3.5	2	2.5	2.5		
	Small Glass	1	3.5	4	4	2	2	2	4.25	2.36
		2	3	4.5	4	2	2.5	2.5		
		3	4	5	4.5	2.5	2.5	2.5		
		4	4.5	5	5	2	3	3		

**Summary:**

**Tall Glass Spotting Averages**

Dishwasher Gel Evaluated	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Total Cycle Average
AGAE	2.89	3.58	3.67	3.97	3.83	<b>3.59</b>
Cascade Complete	2.36	2.58	2.42	2.39	2.67	<b>2.48</b>
Seventh Generation	2.83	2.94	3.28	3.67	3.36	<b>3.22</b>

**Tall Glass Filming Averages**

Dishwasher Gel Evaluated	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Total Cycle Average
AGAE	3.89	3.53	3.81	3.25	3.25	<b>3.55</b>
Cascade Complete	1.94	1.83	2.03	1.94	1.97	<b>1.94</b>
Seventh Generation	2.31	2.00	2.42	2.31	2.17	<b>2.24</b>

**Small Glass Spotting Averages**

Dishwasher Gel Evaluated	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Total Cycle Average
AGAE	2.54	3.50	4.42	4.13	4.38	<b>3.79</b>
Cascade Complete	2.33	2.96	3.54	3.67	3.50	<b>3.20</b>
Seventh Generation	3.21	3.79	3.88	4.29	4.25	<b>3.88</b>

**Small Glass Filming Averages**

Dishwasher Gel Evaluated	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Total Cycle Average
AGAE	2.63	3.50	3.96	3.17	3.67	<b>3.39</b>
Cascade Complete	2.29	1.92	2.42	2.50	2.63	<b>2.35</b>
Seventh Generation	1.92	2.08	2.13	2.13	2.36	<b>2.12</b>

Summary:

## CLEANING LABORATORY EVALUATION SUMMARY

<b>Substrates:</b>	Ceramics, Glass/Quartz				
<b>Contaminants:</b>	Food				
<b>Company Name:</b>	<b>Product Name:</b>	<b>Conc.:</b>	<b>Efficiency:</b>	<b>Effective:</b>	<b>Observations:</b>
AGAE Technologies	Dishwasher Detergent Gel	100%		<input type="checkbox"/>	
Clorox Company	Cascade Complete Dishwasher Gel	100%		<input checked="" type="checkbox"/>	
Seventh Generation	Free & Clear Automatic Dish Gel	100%		<input checked="" type="checkbox"/>	

Conclusion:

The Cascade Complete Dishwasher Gel was the most effective overall (tall and small glassware) compared to the Seventh Generation Dishwasher Gel, which in turn was more effective than the AGAE Dishwasher Gel.