

# DCS Global Enterprise Inc.

Clean for Health  
Graduated Scoring System

Sample Completed Audit

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## SCOPE OF WORK

The consultant will on behalf of a client work with Client managers to develop 'standards of performance' with respect to the Client's Clean for Health program including:

- Setting up and execution of a series of baseline tests of cleaning activity and surface sanitization testing that will provide data to be utilized to define the standards of performance of the CLIENT Clean for Health.
- The standards will provide a range of readings for high, medium and low risk surfaces.
- Within each of the three surface risk categories: High, Medium and Low, there will be five result subcategories, defined as; Excellent, Good, Satisfactory, Marginal and Poor.
- Tests will be conducted within the CLIENT facilities as directed.
- Standards will be developed collaboratively between DCS Daylight Cleaning Systems Inc.® and Client.

## METHODOLOGY

The Client's Clean for Health system previously operated on a 'pass or fail' testing method, which was based on readings collected at each specific site. Following the initial benchmark testing, the Client engaged DCS Daylight Cleaning Systems Inc.® to finalize a Graduated Scoring System which would allow flexibility in the testing system without degrading the effectiveness of the program.

The Clean for Health testing program uses ATP Bioluminescence to measure the sanitization level of a surface. The system is explained below:

ATP Bioluminescence is a Rapid Microbiological Method

Research Article: ATP vs. Traditional Methods

The significant limitations of traditional methods, the heightened concern regarding safety and the need for better and timelier cleanliness testing have caused the usage of ATP bioluminescence testing systems to increase significantly in recent years. Although ATP bioluminescence technology has been commercially available since the 1970's, only recently have advances in portable instrumentation and time stable reagent chemistry been achieved. With these advanced, ATP bioluminescence has gained widespread acceptance within the industry as the technology provides significant benefits over traditional methods of cleanliness testing.

Bioluminescence is best known as the flash of light from the firefly's tail, which occurs when the enzyme luciferase comes into contact with the molecule ATP (adenosine triphosphate), which is present in the cells of all living organisms. The amount of light produced is directly proportional to the amount of ATP present, and is measured by sensitive light meters (luminometers) and usually expressed in terms of Relative light Units (RLU).

The measurement of total ATP allows real time measurement of total biological residue, both microbial and residue, on surfaces to determine the potential for microbial contamination from surfaces which have not been properly cleaned. The entire test typically takes less than a minute to complete, thus becoming a "real time" test and allowing for immediate corrective action.

Excerpt from: Rapid detection of microbial contamination/activity  
(Josef Farkas – Hungarian Scientific Society, Budapest, Hungary)

"The ATP bioluminescence methods can be effective because of their very rapid assessment of hygiene and sanitation efficacy."

DCS uses the ATP bioluminescence process and instruments to measure bacteriological levels on a wide array of surfaces to provide an accurate level of cleanliness and sanitation.

## Pass / Fail Program Overview

Different surfaces and types of surface use equate to different levels of risk when it comes to Clean for Health Testing. The DCS testing program identifies acceptable ranges for a variety of surfaces.

Identified surfaces have been separated into 3 categories:

- High Risk,
- Medium Risk
- Low Risk

High Risk surfaces are those surfaces where human touch points are closely associated with bodily fluid / mucus membrane contact; for instance, cafeteria tables would be considered a high risk surface as it would be touched directly before placing items in the mouth. Telephone handsets, washrooms, locker rooms, water fountains, student desks including kindergarten work/play stations and staff room counters would also fall into this category. Due to the fact that the risk is higher, the tolerance on testing is tighter, making the passing grade 20 or lower.

Medium Risk surfaces are those surfaces where human touch points have a lower association with coming into contact with bodily fluids / mucus membranes. Surfaces such as student chairs, gym benches, library tables/cubicles, administration office desks, staff room tables and hallway benches would be placed into this risk category. Since the risk associated with this category is slightly lower than the previous threshold for high risk surfaces, any reading of 40 or under would be considered a passing grade.

Low Risk surfaces are where human touch points have the lowest possibility of bodily fluid contact. Locations where the volume of traffic is higher but not necessarily more sensitive; such as entrance doors, light switches, pencil sharpeners and office counters would be examples of such surfaces. Since the risk is lower, a reading of 60 or under would be considered a passing grade.

## Graduated Scoring System Overview

The basis for the Graduated Scoring System was built upon the pass/fail system described previously. The Graduated Scoring system removes the actual readings from the previous method of reporting and replaces it with a scale of 1 to 5; with 1 being poor, and 5 being excellent, based on the sanitization level of the surface. The shift from the single pass/fail threshold allows readings which were close to passing but still registering as a fail, to now be included in a less negative impact on the testing results.

### **High Risk Surfaces – Previous pass/fail mark      20**

Reading	Sanitization Value
1	46+
2	41-45
3	31-40
4	21-30
5	20 or less

### **Medium Risk Surfaces - Previous pass/fail mark      40**

Reading	Sanitization Value
1	66+
2	61-65
3	51-60
4	41-50
5	40 or less

### **Low Risk Surfaces - Previous pass/fail mark      60**

Reading	Sanitization Value
1	86+
2	81-85
3	71-80
4	61-70
5	60 or less

DCS Daylight Cleaning Systems Inc.® was assigned the test sites chosen by the CLIENT. The sample size was increased significantly for this series of testing, than previous testing, in order to ensure that sufficient data was collected for statistical analysis.

The standard monitoring sample would have averaged 25 to 40 swabs per site

In the first series of tests, Test One was performed on June 28<sup>th</sup>, 2008 after the students had left for the day and prior to the evening clean. This was scheduled with intent in order to create the baseline results, of the sanitization results following a standard day of use.

Test Two of the first series was conducted on June 30<sup>th</sup>, 2008. The testing was purposefully completed in the evening hours, following the daily cleaning tasks, which executed the specifications of the Client's Clean for Health program.

The second series of tests occurred between September 10<sup>th</sup>, 2008 and October 6<sup>th</sup>, 2008. There were two additional testing sites added to the program to ensure the Graduated Scoring System would be applicable to the full range of building types.

The results from the testing were analyzed to show how the existing pass/fail standards and *Graduated Scoring System* categories would be affected. The analysis would need to show if the existing pass/fail thresholds and therefore the Graduated Scoring System would have sufficient allowances for the effectiveness of the CLIENT Clean for Health system on specific types of surfaces.

# OBSERVATIONS

All test sites were selected by the Client, identified to represent a standard use facility, with adequate hours for trained staff, and with full complement of supplies in order to execute the CLIENT Clean for Health program on a daily basis.

## TEST ONE - BASE LINE

### Site 1

The baseline results at this school registered the following levels on site; High Risk surfaces averaging a reading of 106 RLU's, Medium Risk surfaces were averaging 106 RLU's and the Low Risk surfaces averaged 77 RLU's.

### Site 2

Test One at the second site showed moderate soil levels throughout the school with High Risk surfaces averaging a reading of 105 RLU's, Medium Risk surfaces averaging 91 RLU's and Low Risk surfaces averaging 113 RLU's.

### Site 3

Test One at the third site showed mid-range sanitization levels throughout the site with High Risk surfaces averaging a reading of 74 RLU's, Medium Risk surfaces averaging 39 RLU's and Low Risk surfaces averaging 57 RLU's.



## TEST TWO – FOLLOW UP TEST

### Site 1

Test Two was executed on schedule, approximately one week following the initial test. Test two was conducted directly following the daily cleaning tasks, as outlined in the CLIENT Clean for Health program.

The results at this school indicated that the sanitization levels increased significantly. High Risk surfaces averaged 9 RLU's, Medium Risk surfaces averaged 16 RLU's and Low Risk surfaces averaged 33 RLU's. The overall sanitization levels of the site improved by 85.7% between test one and test two.

### Site 2

The second test at this site was delayed three weeks due to a leave of absence taken by the head caretaker and staff shortages. When Test Two was performed, there was still;

- a .5 FTE shortage of cleaning time, and
- 50% of the evening custodial staff had been on site for only a week

Even facing these challenges, the increase in sanitization levels were found to be impressive. High Risk surfaces averaged 28 RLU's, Medium Risk surfaces averaged 35 RLU's and Low Risk surfaces averaged 80 RLU's.

The overall sanitization levels of the site improved by 69.23% between Test One and Test Two.

### Site 3

Test Two at this school again was completed on schedule; that is to say, within a week after the initial testing period.

It is noteworthy to mention that there are some anomalies associated with this specific CLIENT site.

- There was a shortage of two cleaning hours per evening.
- 75% of the staff had no previous school cleaning experience
- Of those new staff, over 80% of them were ESL custodians.

With all the elements taken into consideration, the increased sanitization levels were found to be excellent.

High Risk surfaces averaged 20 RLU's, Medium Risk surfaces averaged 21 RLU's and Low Risk surfaces averaged 50 RLU's. The overall sanitization levels of the site improved by 72.14% between test one and test two.

Please refer to the appendices for a detailed breakdown of the surface ranges at the different sites.

# CONCLUSIONS

The sample test size provided a significant amount of information in regards to levels of sanitization and how they were affected by the CLIENT Clean for Health program. With 588 surfaces tested in the sample size, the primary conclusion determined was that the existing pass/fail thresholds of:

- 20 High Risk Surfaces
- 40 Medium Risk Surfaces
- 60 Low Risk Surfaces

were found to be suitably established in the 2007 CLIENT's Clean for Health project, and that identified scoring range can be considered satisfactory to be identified as the Client's graduated scoring system.

By instituting the *Graduated Scoring System*, we can monitor how a surface can be affected more so than focusing on a pass/fail test result. The data findings indicate it does not matter what the type of surface is, be it high, medium or low, but whether or not it was cleaned following the CLIENT Clean for Health procedures.

Clean surfaces have very low RLU readings in general. In Appendix A, the number of passing readings beneath the threshold is closer to 0 than to the threshold number. For instance, a medium risk surface, with a low threshold of 40, would still have 93% of the readings being under 40. This is not to say the general threshold should be 40 or under for all surfaces, but merely that cleaned surfaces generally report low RLU readings.

It is significant to mention that Health Canada sets a threshold of 35 for food safe sanitary conditions. The CLIENT's High risk surface type threshold is under this level. We feel the evaluation of the system is still achievable with the proper execution of the CLIENT Clean for Health program.

## RECOMMENDATIONS

1. To preserve the Client's Clean for Health System holistic view of Clean for Health, in terms of chemical usage, equipment, procedures, priorities and custodial function.
2. To establish a blind surface testing schedule in the months of October/November and March/April, in order to test the Clean for Health system, without interfering with the natural thorough cleaning schedules and higher cycles of activity.
3. To maintain the *Graduated Scoring System* and identified ranges as presented in this report.

# Appendix A

## Graduated Scoring Results

### Site 1

	Test 1	Test 2	% Change
<b>High Risk Surfaces Average (RLU's)</b>	<b>106</b>	<b>9</b>	<b>-91.79%</b>
Readings over 46	43	1	-97.67%
Readings between 41-45	3	2	-33.33%
Readings between 31-40	14	1	-92.86%
Readings between 21-30	5	8	60.00%
Readings under 20	22	75	240.91%
<b>Total High Risk Surfaces Tested</b>	<b>87</b>	<b>87</b>	
<b>Medium Risk Surfaces Average (RLU's)</b>	<b>106</b>	<b>16</b>	<b>-84.96%</b>
Readings over 66	17	1	-94.12%
Readings between 61-65	0	0	0.00%
Readings between 51-60	2	0	-100.00%
Readings between 41-50	6	2	-66.67%
Readings under 40	19	41	115.79%
<b>Total Medium Risk Surfaces Tested</b>	<b>44</b>	<b>44</b>	
<b>Low Risk Surfaces Average (RLU's)</b>	<b>77</b>	<b>33</b>	<b>-57.95%</b>
Readings over 86	13	1	-92.31%
Readings between 81-85	1	1	0.00%
Readings between 71-80	1	0	-100.00%
Readings between 61-70	6	0	-100.00%
Readings under 60	39	58	48.72%
<b>Total Low Risk Surfaces Tested</b>	<b>60</b>	<b>60</b>	

### Site 2

Test 1    Test 2    % Change

<b>High Risk Surfaces Average</b>	<b>105</b>	<b>28</b>	<b>-72.83%</b>
Readings over 46	57	18	-68.42%
Readings between 41-45	2	3	50.00%
Readings between 31-40	9	9	0.00%
Readings between 21-30	9	5	-44.44%
Readings under 20	14	57	307.14%
<b>Total High Risk Surfaces Tested</b>	<b>91</b>	<b>92</b>	
<b>Medium Risk Surfaces Average</b>	<b>48</b>	<b>35</b>	<b>-28.28%</b>
Readings over 66	12	7	-41.67%
Readings between 61-65	0	0	0.00%
Readings between 51-60	3	2	-33.33%
Readings between 41-50	5	3	-40.00%
Readings under 40	24	32	33.33%
Readings between 31-40	3	3	0.00%
Readings between 21-30	4	11	175.00%
Readings under 20	17	18	5.88%
<b>Total Medium Risk Surfaces Tested</b>	<b>44</b>	<b>44</b>	
<b>Low Risk Surfaces Average</b>	<b>113</b>	<b>80</b>	<b>-29.37%</b>
Readings over 86	30	3	-90.00%
Readings between 81-85	1	0	-100.00%
Readings between 71-80	4	0	-100.00%
Readings between 61-70	5	1	-80.00%
Readings under 60	22	58	163.64%
Readings between 51-60	5	1	-80.00%
Readings between 41-50	4	1	-75.00%
Readings between 31-40	3	5	66.67%
Readings between 21-30	3	9	200.00%
Readings under 20	7	42	500.00%

## Site 3

	Test 1	Test 2	% Change
<b>High Risk Surfaces Average</b>	<b>74</b>	<b>20</b>	<b>-72.81%</b>
Readings over 46	38	8	-78.95%
Readings between 41-45	6	2	-66.67%
Readings between 31-40	8	8	0.00%
Readings between 21-30	13	10	-23.08%
Readings under 20	29	66	127.59%
<b>Total High Risk Surfaces Tested</b>	<b>94</b>	<b>94</b>	
<b>Medium Risk Surfaces Average</b>	<b>39</b>	<b>21</b>	<b>-47.64%</b>
Readings over 66	9	2	-77.78%
Readings between 61-65	0	2	0.00%
Readings between 51-60	3	1	-66.67%
Readings between 41-50	2	0	-100.00%
Readings under 40	30	39	30.00%
Readings between 31-40	4	5	25.00%
Readings between 21-30	10	5	-50.00%
Readings under 20	16	29	81.25%
<b>Total Medium Risk Surfaces Tested</b>	<b>44</b>	<b>44</b>	
<b>Low Risk Surfaces Average</b>	<b>57</b>	<b>50</b>	<b>-12.20%</b>
Readings over 86	12	3	-75.00%
Readings between 81-85	1	0	-100.00%
Readings between 71-80	1	2	100.00%
Readings between 61-70	5	2	-60.00%
Readings under 60	43	55	27.91%
Readings between 51-60	2	2	0.00%
Readings between 41-50	8	2	-75.00%
Readings between 31-40	9	4	-55.56%
Readings between 21-30	13	11	-15.38%
Readings under 20	11	36	227.27%
<b>Total Low Risk Surfaces Tested</b>	<b>62</b>	<b>62</b>	

# Appendix B

## Site One Summary

	Test 1	Test 2	% Change
Classroom student desktop average (H)	89.90	8.45	<b>-90.60%</b>
Classroom telephone average (H)	43.17	6.75	<b>-84.36%</b>
Classroom door handle average (L)	72.07	16.53	<b>-77.06%</b>
Classroom light switch average (L)	20.40	6.80	<b>-66.67%</b>
Classroom computer desk average (L)	36.10	13.00	<b>-63.99%</b>
Classroom chair back average (M)	97.87	18.73	<b>-80.86%</b>
Hallway water fountain average (H)	140.00	7.50	<b>-94.64%</b>
Hallway door handle average (L)	49.00	7.29	<b>-85.13%</b>
Hallway shelf average (L)	66.67	29.33	<b>-56.00%</b>
Office telephone average (H)	29.86	10.00	<b>-66.51%</b>
Office desktop average (M)	25.33	7.00	<b>-72.37%</b>
Staff Room table average (M)	289.20	20.80	<b>-92.81%</b>
Girl's W/R toilet seat average (H)	25.86	13.14	<b>-49.17%</b>
Girl's W/R partition door average (H)	47.33	6.17	<b>-86.97%</b>
Girl's W/R sink taps average (H)	317.00	7.17	<b>-97.74%</b>
Boy's W/R sink taps average (H)	214.75	5.50	<b>-97.44%</b>

... cont'd



Boy's W/R partition door average (H)	134.00	14.50	<b>-89.18%</b>
Boy's W/R toilet seat average (H)	83.50	12.00	<b>-85.63%</b>
Boy's W/R urinal handle average (H)	137.80	3.40	<b>-97.53%</b>
Staff W/R toilet seat average (H)	80.67	4.67	<b>-94.21%</b>
Staff W/R sink tap average (H)	31.00	10.50	<b>-66.13%</b>
Entrance door average (L)	143.83	6.67	<b>-95.37%</b>
Gymnasium bench average (L)	23.00	52.50	<b>128.26%</b>
Gymnasium door average (L)	56.00	2.50	<b>-95.54%</b>
Library table top average (M)	37.00	22.75	<b>-38.51%</b>
Library countertop average (M)	56.50	8.50	<b>-84.96%</b>
Library chair back average (M)	109.30	7.30	<b>-93.32%</b>
<b>Average Total</b>	<b>2,496.60</b>	<b>356.95</b>	<b>-85.70%</b>

## Site Two Summary

	Test 1	Test 2	% Change
Classroom student desktop average (H)	49.45	35.00	<b>-29.22%</b>
Classroom telephone average (H)	64.08	14.75	<b>-76.98%</b>
Hallway water fountain average (H)	263.75	89.75	<b>-65.97%</b>
Office telephone average (H)	50.40	12.40	<b>-75.40%</b>
Girl's W/R toilet seat average (H)	116.29	20.29	<b>-82.56%</b>
Girl's W/R partition door average (H)	55.50	41.17	<b>-25.83%</b>
Girl's W/R sink taps average (H)	84.83	14.67	<b>-82.71%</b>

Boy's W/R sink taps average (H)	234.50	42.25	<b>-81.98%</b>
Boy's W/R partition door average (H)	24.50	33.50	<b>36.73%</b>
Boy's W/R toilet seat average (H)	322.00	29.50	<b>-90.84%</b>
Boy's W/R urinal handle average (H)	294.80	39.60	<b>-86.57%</b>
Staff W/R toilet seat average (H)	64.67	18.00	<b>-72.16%</b>
Staff W/R sink tap average (H)	115.50	7.50	<b>-93.51%</b>
Classroom chair back average (M)	40.60	15.60	<b>-61.58%</b>
Library table top average (M)	79.75	35.50	<b>-55.49%</b>
Library countertop average (M)	31.50	64.00	<b>103.17%</b>
Library chair back average (M)	48.00	71.00	<b>47.92%</b>
Office desktop average (M)	35.33	20.00	<b>-43.40%</b>
Staff Room table average (M)	24.60	18.40	<b>-25.20%</b>
Hallway door handle average (L)	81.86	23.29	<b>-71.55%</b>
Hallway shelf average (L)	52.33	9.67	<b>-81.53%</b>
Entrance door average (L)	164.33	21.50	<b>-86.92%</b>
Gymnasium bench average (L)	64.50	121.50	<b>88.37%</b>
Gymnasium door average (L)	146.50	24.00	<b>-83.62%</b>
Classroom door handle average (L)	176.60	18.93	<b>-89.28%</b>
Classroom light switch average (L)	81.00	10.10	<b>-87.53%</b>
Classroom computer desk average (L)	62.60	18.90	<b>-69.81%</b>
<b>Average Total</b>	<b>2,829.78</b>	<b>870.75</b>	<b>-69.23%</b>

## Site Three Summary

	Test 1	Test 2	% Change
Classroom student desktop average (H)	29.30	20.25	<b>-30.89%</b>
Classroom telephone average (H)	30.42	34.83	<b>14.52%</b>
Hallway water fountain average (H)	157.00	10.75	<b>-93.15%</b>
Office telephone average (H)	67.86	3.00	<b>-95.58%</b>
Girl's W/R toilet seat average (H)	38.71	7.14	<b>-81.55%</b>
Girl's W/R partition door average (H)	42.17	6.17	<b>-85.38%</b>
Girl's W/R sink taps average (H)	133.17	24.33	<b>-81.73%</b>
Boy's W/R sink taps average (H)	261.50	32.50	<b>-87.57%</b>
Boy's W/R partition door average (H)	62.00	42.50	<b>-31.45%</b>
Boy's W/R toilet seat average (H)	16.00	15.50	<b>-3.13%</b>
Boy's W/R urinal handle average (H)	171.80	24.20	<b>-85.91%</b>
Staff W/R toilet seat average (H)	17.67	4.33	<b>-75.47%</b>
Staff W/R sink tap average (H)	137.50	5.00	<b>-96.36%</b>
Classroom chair back average (M)	33.93	20.53	<b>-39.49%</b>
Library table top average (M)	53.50	28.75	<b>-46.26%</b>
Library countertop average (M)	26.50	1.00	<b>-96.23%</b>
Library chair back average (M)	35.50	20.10	<b>-43.38%</b>
Office desktop average (M)	12.00	8.33	<b>-30.56%</b>

Staff Room table average (M)	51.40	0.60	<b>-98.83%</b>
Hallway door handle average (L)	40.57	16.29	<b>-59.86%</b>
Hallway shelf average (L)	22.00	1.00	<b>-95.45%</b>
Entrance door average (L)	77.50	30.33	<b>-60.86%</b>
Gymnasium bench average (L)	77.00	35.50	<b>-53.90%</b>
Gymnasium door average (L)	72.00	67.17	<b>-6.71%</b>
Classroom door handle average (L)	69.67	27.20	<b>-60.96%</b>
Classroom light switch average (L)	29.80	22.90	<b>-23.15%</b>
Classroom computer desk average (L)	85.80	5.90	<b>-93.12%</b>
<b>Average Total</b>	<b>1,852.26</b>	<b>516.11</b>	<b>-72.14%</b>

# Appendix C

## Graduated Scoring System Overview

The basis for the Graduated Scoring System was built upon the pass/fail system, previously in effect in the CLIENT Clean for Health Program. The Graduated Scoring System removes the actual readings from the previous method of reporting and replaces it with a scale of 1 to 5; with 1 being poor, and 5 being excellent, based on the sanitization level of the surface.

	Poor (1)
	Needs Improvement (2)
	Average (3)
	Good (4)
	Excellent (5)