



ec-H2O Performance Testing

ec-H2O
ELECTRICALLY CONVERTED WATER

1.0 Objective

Quantify the short term affects of ec-H2O technology on gloss level and cleaning performance –versus customer’s current floor cleaning method.

2.0 Equipment

2.1 ec-H2O machine and ec-H2O testing components (gloss meter, ATP Meter and swabs).

2.2 Current cleaning system: scrubber-drier, detergent and measuring device. (Or, if unavailable, the ec-H2O machine can be used in conventional mode to show the difference of conventional vs. ec-H2O.)

2.3 Ordering information: To order an **ATP meter**, please contact **Lorrie Reznicek** at Tennant Company lorrie.reznicek@tennantco.com with an account number and a ship-to address. Please send the request to Lorrie and she will place the order on your behalf.

2.4 Ordering swabs: It is better to order Hygiena swabs locally due to handling requirements. To order Hygiena swabs, go to the link below. To find international distributors click on the “sales” link at the top right side of the page and follow as appropriate. http://www.hygiena.net/enquiry_form.html#
If you are interested in seeing more on how to properly use the swabs and meter, go the Hygiena web site and watch the demo video. For those with access to Tennant’s Intranet site, the video from Kaivac shows the complete process of using the swabs and meter. Go to the Kaivac site to the video entitled “ATP Monitor Video”.




following unit listed below. This unit can measure the gloss level at three different angles – 20, 60 and 85 degrees. The unit is approximately \$5,500 USD.


http://www.byk.com/instruments/products/appearance_gloss_micro-tri-gloss_1_US.php



2.6 Depending upon the time line available to you, the testing may be done over a very brief period (three days). Discuss with the client the time available for testing. Please note that the change in the gloss reading levels may be lessened during brief testing cycles.

2.7 Note: Any step that has the icon shown – take a digital picture to record the step. 

3.0 Test Set Up

3.1 Select and mark-off a “test area.” 

3.1.1 *The area should be away from entryways, and other areas where the dirt level of the floor will be greatly affected by changes in weather outside the customer site.*



2.5 If you do not already have a gloss meter or cannot borrow one, we recommend the

- 3.1.2 *The area should be a main aisle, approximately 100ft/10m long, 2 to 4 scrubber paths wide, and straight.*
- 3.2 Choose 3 representative measurement-areas along the test floor for evaluation. Each area should be about 2 Ft x 2 Ft (or 4 VCT tiles square) or approximately 60 cm x 60 cm.

3.2.1 *The areas should be positioned in the center of the aisle. Mark the spots by putting a piece of tape along the side of the aisle, away from the measurement area. (Burnished tape can affect gloss readings)*

- 3.3 To ensure the measurement area locations are not forgotten, sketch your areas on the layout template included near the end of these instructions.



- 3.4 Before testing, clean out the recovery tanks of both the customer's existing scrubber, and the ec-H2O enabled scrubber. Make sure to completely clean out and drain the recovery-tank drain hose on both machines.



- 3.5 Setup the ec-H2O enabled machine for use at customer site. Run the ec-H2O machine for 10 minutes so that it calibrates the ec-


H2O system to the customer site. Make sure to run the machine in an area *away from any of the test sites*.



Procedure

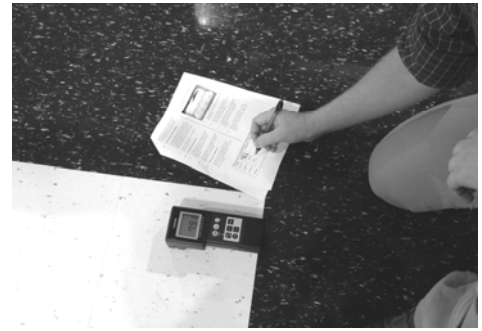
4.0 First Session: Conventional Cleaning vs. ec-H2O Cleaning



- 4.1 Unpack ec-H2O testing components.
- 4.2 With the ATP meter and swabs, make sure to take 3 samples (per area – not overlapping) prior to testing. This means that there should be 3 swabs used on each “conventional” test area and 3 on the “ec-H2O” test area. This will allow for an “average” level of cleanliness to be established. The same number will be taken per test area after the conventional scrubber and ec-H2O scrubber has been used. In order to have reliable readings, swabs should have been refrigerated within the past 4 weeks.
- 4.3 To properly swab the floor, a sample is taken by rolling the swab smoothly between fingers and covering an area of 1 in. x 1 in. / 2 cm x 2 cm. Roll the swab over the surface- do not push or scrape the material off the floor. Place the swab back into the tube and crack the snap valve one way and then the other. Squeeze the bulb twice, expelling all liquid down the swab shaft. Shake the tube for approximately 5 seconds, bathing it in the reagent to activate. Insert the swab and tube into the meter and press the OK button. Results are displayed in 15 seconds. (NOTE: – make sure to hold the meter vertically during this time or the results will not be accurate.) Take a picture of the results as they appear on the meter. ATP

meter readings less than 100, imply that the area is clean. 

- 4.4 Check the calibration of the gloss meter. Measure the gloss level of the floor at 3 random points and angles inside each pre-determined measurement area. Take a picture of the results as they appear on the meter. 
- 4.5 Record all figures on a separate spreadsheet for ATP and gloss meter readings (available through Tennant).
- 4.6 Initially, scrub one side of the test area with the customer's existing machine, then scrub the other side, with the ec-H2O machine. Keep all variables common between the machines; same pads, same pad-life, same brush pressure, etc. Take "after" ATP swab samples and gloss meter results and record the figures.
- 4.7 If only one Tennant machine is being used to show the effectiveness of ec-H2O technology, make sure to use the machine using ec-H2O technology first. After scrubbing all areas with ec-H2O technology, switch the machine over to "conventional" scrubbing. Make sure to measure the appropriate amount of the customer's daily scrubbing chemical for the amount of water remaining in the solution tank. Run the machine for a few minutes prior to testing to ensure that detergent is running through the machine. *Make sure to run the machine away from test sites.*
- 4.8 Use the existing burnisher to burnish the test area floor.
- 4.9 Measure "after" gloss levels at the pre-determined sites at the same angles each time. 



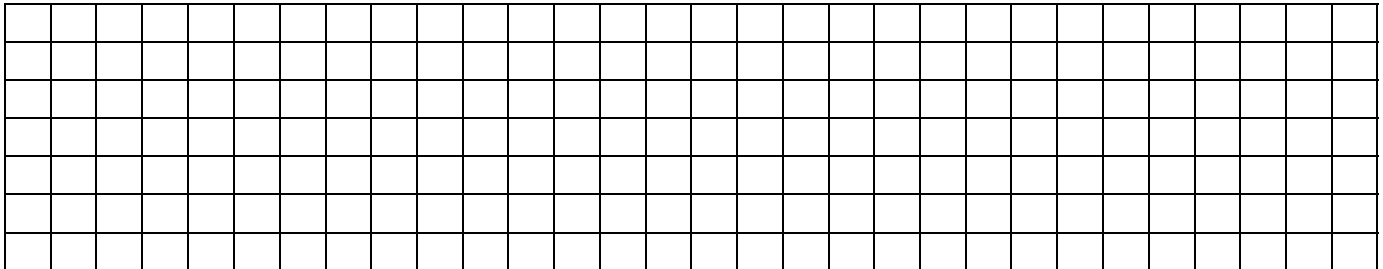
- 4.10 Continue to burnish according to the facility's normal schedule throughout the test.
- 5.0 Begin Daily ec-H2O Testing**
- 5.1 Repeat the testing procedures from step # 4 as appropriate. Make sure the machine(s) have been properly drained and cleaned before using.
- 6.0 Technology Comparison**
- 6.1 After the third and final session calculate the averages, and the %-improvement, and enter into the gloss-level & ATP data-sheet (separate documents).
- 6.2 Evaluate and report the results as appropriate. This information and correlating pictures should be incorporated into a PPT presentation for the customer. For more information on this PPT, please go to the intranet site for ec-H2O.
- 6.3 When completed, send your information to one the contacts listed below. The information will then be posted in an accessible area for us to share within Tennant. If you have questions regarding the testing procedures contact:

Julie Hartz at 616-994-4419
Julie.hartz@tennantco.com
Sven Toelen at 763-513-1867
Sven.toelen@tennantco.com

Notes:

Sketch your ATP and gloss measurement testing locations here:

- *Draw a box to indicate the area from which ATP and gloss measurements will be taken.*
- *Label the locations, 1, 2, and 3.*
- *Sketch in any unique features in the aisle, to help you better locate your measurement areas.*
Tape off to the side of the test site can also be used to confirm testing locations.



Background Information

What is ATP?

ATP (adenosine triphosphate) is present in all organic material, and is the universal unit of energy used in all living cells. ATP is produced and/or broken down in metabolic processes in all living systems. Processes such as photosynthesis in plants, muscle contraction in humans, respiration in fungi and fermentation in yeast are all driven by ATP. Therefore, most foods and microbial cells will contain some level of naturally occurring ATP.

What do ATP swabs along with the ATP meter measure?

The meter (in conjunction with the ATP swabs) use bioluminescence to detect residual ATP as an indicator of surface cleanliness. The presence of ATP on a surface indicates improper cleaning and the presence of contamination, including food residue, allergens and/or bacteria. This implies a potential for the surface to harbor and support bacterial growth.

Note: The organic material can be alive or dead and still register ATP is present. Therefore, although there can be a correlation, this does not directly measure levels of live bacteria.

Why is ATP a good measurement of cleanliness of a surface?

The relationship between the amount of ATP on the sample and the RLU (Relative Light Units) result reading on the luminometer is simple:

High contamination (improper cleaning)

=

Large amount of ATP

=

More light produced in swab reaction

=

High RLU (Relative Light Units) reading on ATP meter

The RLU reading is directly proportional to the amount of ATP collected from the sample. A high RLU reading indicates a large amount of ATP at the test location. This in turn indicates improper cleaning and the presence of contaminants.

Cleaning properly results in less ATP at the location. Less ATP results in less light output during the bioluminescent reaction and consequently, a lower RLU reading.

What is the “shelf life” of the ATP swabs?

12 months at refrigerated temperatures (2-8° C)/(36-47° F)

4 weeks room temperature (21-25° C)/(70-77° F)

Avoid leaving the swabs at a temperature in excess of 25° C/77° F for more than 20 minutes. If necessary, pack the swabs in a cooler to ensure proper temperatures. Do not leave the swabs in a car on a hot summer day.

What does a gloss meter measure?

A gloss meter measures the reflective index of light. This tool enables quick, accurate measurement of gloss on flat, polished surfaces. In our industry, this allows a service provider to ensure quality control and set a quality standard for floor restoration and fabrication work. It also allows the service provider to demonstrate before and after results.

What type of meters are available?

There are many type of meters available, usually measuring the gloss at the following angles: 20, 60 and 85 degrees. Meters can be single angle or allow multiple angles to be measured.