

A Comparison of the Performance of Commercially Available ATP Hygiene Monitoring Systems Under Real-World Conditions



Introduction

ATP (adenosine triphosphate) hygiene monitoring systems are used to provide food producers and processors with an immediate and objective determination of cleaning efficacy. Many facilities rely on them to make important decisions on personnel performance, equipment serviceability, equipment selection and modifications to their Sanitation Standard Operating Procedures (SSOP).

Neogen recently commissioned NSF International to conduct a battery of tests to objectively measure five major commercial ATP hygiene monitoring systems. In real-world simulations, each system was tested using four differing approaches to determine their accuracy and consistency. Accuracy was determined by measuring the percent recovery of the commodity from a 4 inch x 4 inch (10 cm x 10 cm) stainless steel surface. A higher relative light unit (RLU) score on this measure indicated a more accurate representation of the residue actually present on a surface. Consistency was determined by computing the coefficient of variation (CV%) for the sample set. A lower CV% indicated a more narrow range of scores for a given sample and, therefore, a more consistent system.

Each system was tested using four differing approaches.

Methods

Reference Test

First, ATP standard solutions were pipetted directly onto sample swabs. The mean RLU output was calculated for 25 replicates on each system. The RLU data generated here was used as a reference for calculating ATP recovery in sections two and three.

Recovery Test

In section two of this study, ATP standards were deposited over 4 inch x 4 inch (10 cm x 10 cm) stainless steel surfaces, allowed to dry, and then sampled with the monitoring systems, but this time using a cross-hatch pattern like that in a real-world situation. The percent of ATP recovered was determined by comparing the mean response from the surface recovery to the mean response observed in section one.



Chart 1: Recovery

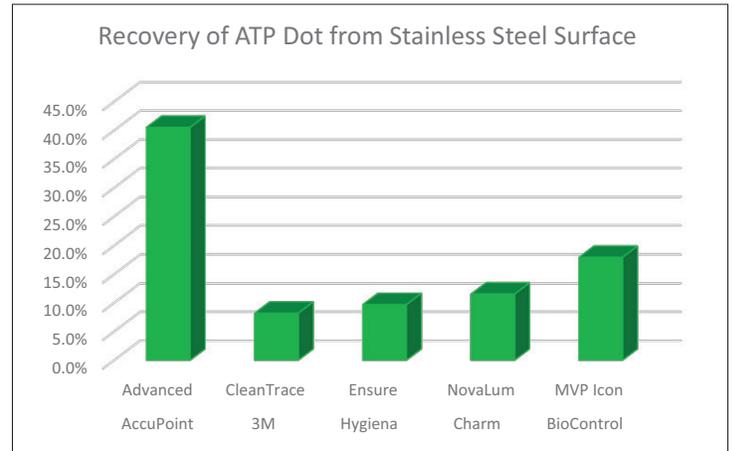


Chart 1 shows the % recovery from the Random Dot test. This clearly shows that AccuPoint Advanced system had the highest recovery of the five systems. With its flat sponge Sampler, AccuPoint Advanced consistently found and accurately reported the presence of the ATP “dot” expressed as percent recovery.

Chart 2: Consistency

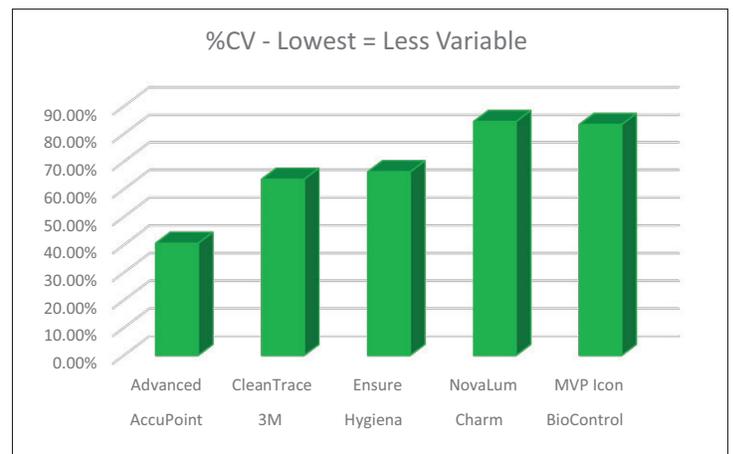


Chart 2 shows the %CV from the Random Dot test. As reported by the coefficient of variation, CV%, the AccuPoint Advanced system had the lowest variability of the five commercial systems at 40.58%.



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Random Dot Test

However, because residue is not homogeneously distributed across a surface after cleaning, in section three, ATP was recovered from a concentrated spot randomly located on 4 inch x 4 inch (10 cm x 10 cm) stainless steel surface. This dot was used to determine the extent and consistency of each system's ability to locate and accurately identify its presence.

As illustrated in Chart 1, AccuPoint Advanced had the highest percent recovery of all five monitoring systems at 40.50% recovery. It also exhibited a percent ATP recovery that was two times greater than the next most efficient monitoring system. AccuPoint Advanced exhibited the greatest consistency in readings (with a CV of 40.58%), indicating that the system is very precise. This is seen in Chart 2.

Commodity (Orange Juice) Test

In section four, orange juice was deposited over a 4 inch x 4 inch (10 cm x 10 cm) stainless steel surface representing a real life situation. This time, all five test systems were used with the cross-hatch swabbing approach. Once again, AccuPoint Advanced had the highest

observed percentage recovery of all five monitoring systems. For each of the orange juice dilutions evaluated, the percent recovery of ATP by AccuPoint Advanced was significantly higher than that of the other four ATP monitoring systems. Neogen's AccuPoint system proved to be the most consistent of the devices evaluated (with a CV of 40.58%).

Conclusion and Discussion

In conclusion, across all real-world test simulations AccuPoint Advanced appeared to be more consistent and accurate in its detection of the amount of ATP on a surface with its patented flat-head samplers. In a production environment, more accurate and consistent results mean more reliable data. This data can be used to make critical decisions such as whether to continue with a subsequent production run or delay that production until a second cleaning can be performed. Reliable information can also result in the prevention of costly product recalls due to undiscovered contamination issues.

For more information or a copy of the NSF Study, please contact Neogen at 800-234-5333 / 517-372-9200.



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