

Hygiene and sanitation monitoring using ATP bioluminescence

Using an ATP bioluminescent assay you can have an accurate, sensitive and quantifiable measurement of surface hygiene and sanitation in minutes, allowing you to focus on manufacturing and production without the down time.

What is ATP?

Adenosine Triphosphate (ATP) is an energy source used by all living organisms including – animals, plants, bacteria, fungi and algae. ATP is present in both living and dead cells making it an ideal indicator for presence of biological material residue. Biological residues, such as proteins, fats, microbes and reducing agents like sugars are a common by-product of food processing and can be associated with contamination, spoilage and food safety concerns.

Today, more than ever before, time is a critical factor in every aspect of manufacturing, thus being able to assess that the cleaning procedure employed are effective, and confirm the hygiene of a critical point is adequate in the minimal amount of time is essential.

Many methods are available to confirm that the manufacturing environment has been effectively cleaned, each method has its own advantages and disadvantages (see Table 1.1).

Table 1.1 Methods on testing hygiene in manufacturing of food products.

	Advantage	Disadvantage
Visual Inspection	Instantaneous. No cost.	Low sensitivity, non-specific.
Total microbial counts	Gold standard for microbiology. Quantitative.	Specific for microorganisms. Cannot detect residual proteins, fats, or other contaminants. Time to results are 24-48hrs.
Protein swabs	Simple, quick, and reliable visual method.	Cannot detect residual microbes.
ATP-Bioluminescence Assay	Reproducible tests Quantitative	Not specific or informative of cause of contamination

How does the ATP bioluminescent assay work?

The ATP bioluminescent assay works by utilizing an enzyme (luciferin) that converts ATP to light via a biological reaction. The light emitted by the reaction is relative to the amount of ATP present, the more ATP available the brighter the signal making the reaction quantitative.

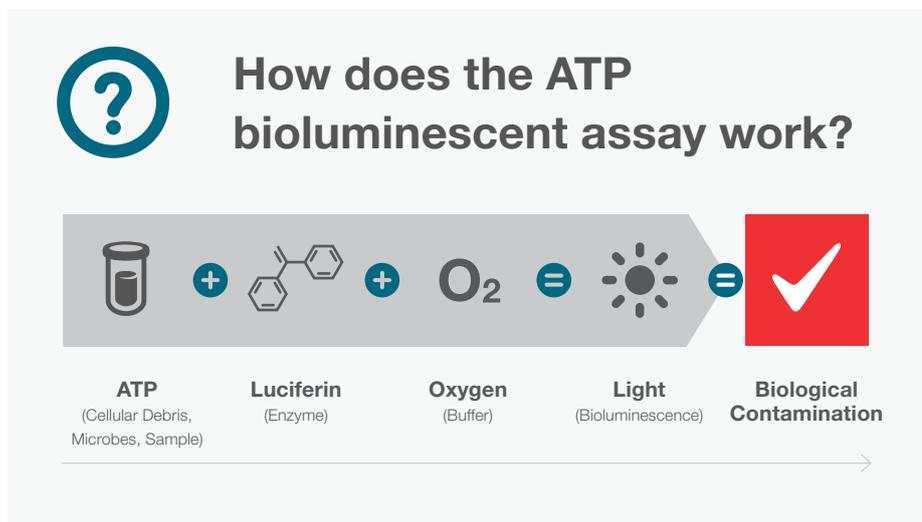


Image 1.1 How ATP Bioluminescence works.

How is cleanliness monitored?

ATP systems work by measuring the light emitted when ATP from biological contaminants interacts with the reagents in the system's sampling device. The intensity of the light created provides a quantitative result that can be used to measure and gauge the effectiveness of sanitation and cleaning procedures. The higher the levels of residue (food, protein, microorganisms and other reducing substances) in a tested area, the more ATP, resulting in higher level of light produced.

Thus, the real advantage of an ATP system is its immediacy of results and quantifiable nature of these results.

Why measure ATP levels if I am after the levels of bacterial contamination on a surface?

ATP monitoring systems can be employed as a screening tool for non-specific biological contamination including bacterial contamination. It provides a quick result and assist to identify area's that require further cleaning and/or testing using traditional methods. ATP testing should not replace traditional microbiological testing as it does not provide live dead designation or species specific identification, which can be essential in product release.

The power of the result comes from both its timeliness, allowing a decision to be made on the effectiveness of cleaning / sanitation, and also from its reproducibility – allowing a method for comparing results and minimising operator to operator variability.

Rapid screening of production lines for sanitation and hygiene ensure maximum production and minimum risk, with reassurance that an effective clean / sanitation has been performed, and the chance of a down-process contamination issue will be greatly reduced.

Where do I start?

Every manufacturing facility is different, with different materials and processes. The first step to understanding your facility hygiene is obtaining reference levels at critical points, and creating reference levels. The test is very robust and reproducible so variations from this established reference level provide a rapid warning of hygiene concerns at the point and indicate further cleaning and/or testing is required.

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