

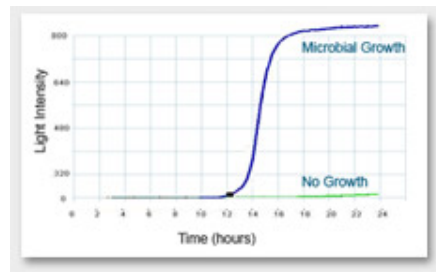


## Frequently Asked Questions

### What is the main principle of the BioLumix technology?

BioLumix technology is based on monitoring changes in a microbial liquid growth medium in which the target microorganisms grow and are detected by unique dyes (color or fluorescence). The dyes change their color or fluorescence as metabolic processes take place. These changes are detected by optical sensors and monitored every 6 minutes.

A crucial element of the technology is the monitoring of these changes in a reading zone found at the bottom of the test vial and separated from an incubation zone, thereby eliminating the masking of the optical pathway by the product and microbial turbidity. The signal is relatively constant until the numbers of microorganisms reach a threshold value; thereafter, there are accelerating changes in the color and fluorescence signals.



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### What is the sensitivity or detection limit of the BioLumix system?

The sensitivity of the BioLumix system is a single viable cell of bacterium or fungi per sample vial. One bacterial cell is usually detected in 8-14 hours while a single yeast cell can be detected in 20-24 hours.

Although the system can detect as little as one cell per vial, organisms must first grow to a level exceeding a pre-determined, specific detection threshold. That threshold for bacteria is  $\approx 100,000$  cells/ml and the threshold for yeast/mold is  $\approx 10,000$  cells/ml. The time to detection depends on the initial concentration of organisms in

the product sample. Therefore, highly contaminated samples rapidly detect, providing rapid warning of contamination.

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## Is the BioLumix Software 21 CFR Part 11 compliant?

The BioLumix software allows the user to comply with FDA regulations related to 21 CFR part 11, to allow electronic records instead of paper records. This regulation is required to comply with cGMP. Some of the key elements of compliance include:

- The software is validated to ensure accuracy, reliability, consistent performance, and the ability to generate accurate copies of the records.
- The records are protected to enable their accurate and ready retrieval throughout the records retention period.
- The software generates a user independent, secure, computer-generated, time stamped audit trail that cannot be altered by the operator.
- The access to the software is limited to authorized individuals

Only Authorized individuals have access to critical operations. Access can be further limited and only authorized by the appropriate personnel.

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## Is your system accepted or approved by the FDA?

The FDA does not approve or disapprove alternative methods. They require only that the alternative method is validated. We have validated our system as required for:

- Specificity (also called inclusivity and exclusivity),
- Limit of Detection,
- Repeatability,
- Robustness,
- Ruggedness,

- False Negative Rate,
- False Positive Rate,
- and Side-by-Side comparison.

Through this comprehensive study we have proved that the BioLumix System is just as accurate as Petri plate methodology.

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## How long does it take for assay results?

The system offers *real-time communication*. As soon as a detection occurs in the system, the operator is alerted. The higher the contamination, the faster the result. This ensures rapid warning of poor quality raw material, in-process material, and finished product. Most completed (below specification) assay results are available either the same day or overnight. Yeast and Mold results can take up to 48 hours.

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## How easy is it to use the BioLumix System?

It only takes 3 quick steps to perform a test:

1. Inoculate the vial with the sample, swab, or filter
  2. Place the vial in the BioLumix instrument
  3. Record the sample in the Windows®-based software
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## What is the shelf-life of the BioLumix disposable vials?

Most vials have a shelf life of 6 months at room temperature. Some supplements may need to be refrigerated.

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## What are the specifications of the BioLumix System?

- The BioLumix instrument is capable of conducting 32 concurrent tests at a single temperature.
- Up to 32 instruments can be attached to one computer.

- There is random access to each vial location and various assays can be run in the same instrument.
  - Each instrument has the shape of a drawer and each drawer of 32 tests has independent temperature control.
  - All instruments can have a temperature test range of 18-60  $\pm$ 0.2°C.
  - The physical size of the BioLumix instrument is 16cm tall x 36cm wide x 65cm deep (6¼”t x 14½”w x 26¼”d) and weighs 15.8 kg (35 pounds).
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## When should calibration curves, dilute to spec, or presence/absence be used?

A standard curve or calibration can be prepared for a given product or group of products if the products are processed similarly and are expected to have the same flora.

Presence/absence endpoints may be applied if few organisms are expected (<10 CFU). In that case, calibration is not recommended. A more simple approach using the presence/absence endpoint is performed after the product has been diluted in appropriate detection medium.

Dilute-to-specification protocol requires diluting the sample to the specification limit required for product action or release. If there is growth, the sample fails; if there is no detection, the sample passes since the counts are below the specification limit.

Functional sterility includes the type of test where there is no allowable number of microorganisms and the product is not expected to contain any living cells. Therefore, in a functional sterility application, a pre-incubation time is incorporated into the protocol. The pre-incubation time is based on the target microflora. After pre-incubation, a sub-sample of the pre-incubation broth is transferred to vials containing the appropriate growth medium for testing.