



# BioLight

# Toxy



**BioLight Toxy Luminometer**

**BioLight Reagents**

brings rapid toxicity testing to the 21st Century !

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## NEXT GENERATION IN TOXICITY TESTING

The Aqua Science BioLight Toxy along with the BioLight Reagents and Consumables brings rapid toxicity testing to the 21st Century.

It offers the most up to date, dual option instrument available for bioluminescent analysis in the market. This is a result of matching a team of experts in ecotoxicity to fulfill the needs of toxicity users around the world.

This state-of-the art luminometer brings together the capabilities of doing portable testing in the field as well as bench top testing in the lab. This all-in-one unit is designed to be used in conjunction with the BioLight Multi and Single Reagent as well as BioLight salinity adjusting solution, BioLight diluent and BioLight Recon. The BioLight Toxy instrument is used to read the differences in light from time zero and after exposure to a sample which could be toxic.



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## TECHNOLOGY

The BioLight Toxy measures the light levels of the marine bacterium *Aliivibrio fischeri* (formerly named *Vibrio fischeri*), used in the BioLight reagent to determine the toxicity of a sample.

Results are reported in % effect or EC50 (effective concentration 50%) dependent on the protocol and use of the portable or bench top instrument. Using the BioLight Toxy along with Aqua Science BioLight Multi or Single Reagents and consumables provides testing that can screen over 3,600 chemical compounds simultaneously, while also detecting synergistic toxicity effects.

The bacteria elicits the brightest light levels following reconstitution. These light levels are measured prior to sample exposure and over time after exposure to a sample, using a luminometer. The luminometer measures the changes in the light to indicate the levels of toxicity.

# Versatile

# Modern

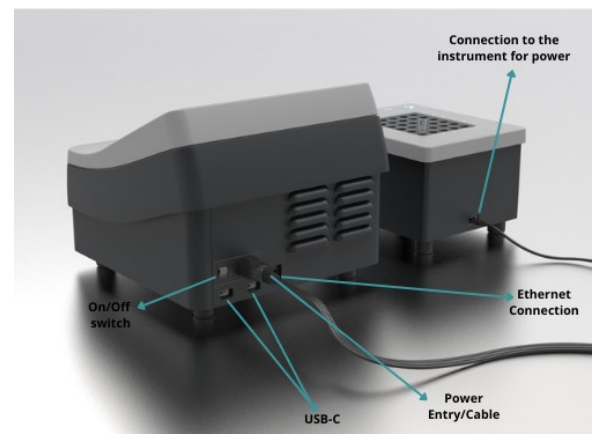
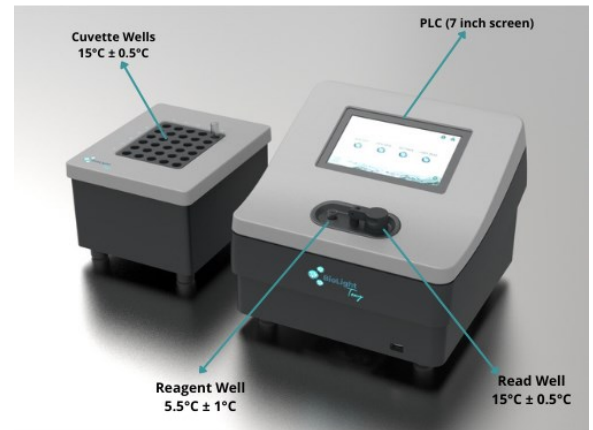
# Affordable

## BIOLIGHT TOXY BENCH TOP

The BioLight Toxy bench top instrument includes a cooled read well and cooled reagent well along with a separate cooling block to ensure all samples are kept at the appropriate temperatures during testing. There is also the option to add an additional cooling block to double the number of samples that can be tested.

Additionally required to perform the analysis are the BioLight Multi Reagent, BioLight Diluent, BioLight Recon, BioLight Salinity Adjusting and disposable glass cuvettes.

When using the BioLight Toxy bench top, there will be multiple protocols available to choose in the onboard software. The software is easy to use and provides all results calculations that can be printed or uploaded to a computer as well as saved in the software. Choosing a protocol will be based on the water type, expected toxicity level and results of the baseline data if available. Most protocols provide results in approximately 45 minutes, including the 15 minutes for the BioLight Multi reagent to equilibrate after reconstitution.



### PORTABLE FEATURES

- Field portable can be connected with external portable power station\*  
\* not included
- Easy to use protocols on board
- Results in 20 minutes



### BENCH TOP FEATURES

- Up to 60 sample wells, allowing 2x the sample volume
- State of the art program on board
- No PC or tablet required
- Read time < 7 seconds
- Cooling to meet all ISO requirements
- SCADA Connectivity
- Remote Acces (with optional WiFi)

## PROTOCOLS

- ⇒ **EC50 Test – 2%, 45% or 81.9%** – Testing that provides a calculated EC50 value and measure relative toxicity.
- **2% EC50 Test** – samples expected to have a high level of toxicity. Typically, this would be for wastewater influent or pure compounds.
  - **45% EC50 Test** – samples of unknown toxicity. This EC50 test measures relative toxicity and is the most adaptable. It is a good option for septage, influent wastewater and water from a treatment digester.
  - **81.9% EC50** – samples expected to have low to medium toxicity. Primarily used for drinking water, wastewater effluent, pore water and stormwater. The expected EC50 level for this test should be between 30% to 50%.
- ⇒ **% Effect Test – 2%, 45% or 81.9%** -Testing using a single concentration. This test will not determine relative toxicity or provide a dose response curve.
- **2% Effect Test** – Used for samples with high toxicity. Wastewater influent, septage, industrial trucked waste.
  - **45% Effect Test** – Used for samples of medium toxicity.
  - **81.9% Effect Test** – Used with samples of low toxicity such as drinking water.
- ⇒ **Comparison Test** – Used to compare the relative acute toxicity of an undetermined sample with a control sample. A control sample could be a sample of a determined toxicity. This is the best test for the analysis of low toxicity samples if the EC50 values can't be achieved using the EC50 test.
- ⇒ **ISO** – Complies with ISO 11348-3. The ISO Standard states that the method is applicable for wastewater, fresh water – both surface and ground, sea and also brackish water, eluates of sediments, pore water – both aqueous extracts and leachates.
- ⇒ **Solids Test** – Used for soils, sediments and other solid samples. The test uses solid samples which are serially diluted with 9.9% being the highest concentration. It can be used for freshwater, marine and estuarine samples with the appropriate diluent. It allows for the detection of toxicity due to the insoluble solids that are not in solution by allowing the test organisms to come in direct contact with the solid sample in an aqueous suspension.

## LUMINESCENT BACTERIA TEST ISO 11348

The bioluminescence inhibition bioassay with *Aliivibrio fischeri* has been standardized in ISO 11348-1, -2 and -3 and widely used for a variety of ecotoxicological applications and research for more than 30 years.

The strict ISO requirements for instrument temperature control in the reagent well, read well and sample cuvette well are all part of the BioLight Toxy. The BioLight Reagents and Consumables also meet all aspects of the ISO method ISO 11348-3 for freeze dried bacteria.





**BioLight**

*Toxy*

# TECHNICAL SPECIFICATIONS

## Luminometer

<b>Dimensions</b>	30 cm W x 35 cm D x 24 cm H
<b>Weight</b>	6.2 kg
<b>Power Requirements</b>	110-220 V AC
<b>Read Well</b>	15 °C ± 0.5 °C
<b>Reagent Well</b>	5 °C ± °C
<b>Versatility</b>	Field portable and/or Bench top
<b>Display</b>	7 inch screen
<b>Read time</b>	< 7 secs (read time per cuvette 3 secs)
<b>Data storage</b>	16 GB (micro-SD card)
<b>Measurement</b>	Photomultiplier tube
<b>Light Source</b>	Bioluminescence
<b>Connectivity</b>	USB, Wi-Fi (optional)
<b>Operation Room Temperature</b>	5 °C to 40 °C
<b>Operational Humidity</b>	5 % - 80 %
<b>SCAD Connectivity</b>	YES
<b>Remote access</b>	YES (with optional Wi-Fi)
<b>Certifications</b>	RoHS, CE, IEC 61010
<b>ISO Manufacturing Accreditation</b>	ISO 13485 FM58342

## Cooling Block

<b>Dimensions</b>	20 cm W x 24 cm D x 15 cm H
<b>Weight</b>	4.7 kg
<b>Power Requirements</b>	From Luminometer
<b>Cooling Block Well Temperature</b>	15 °C ± 0.5 °C
<b>Well Layout</b>	up to 60 wells
<b>Well Block for Solidis</b>	Fit 17 mm tubes
<b>Well Block for Water</b>	Fit 12 mm tubes
<b>Number of Blocks per Unit</b>	Up to 2





## PRODUCTS

### BIO2019L BioLight Toxy - Bench Top

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**Includes :** BioLight Instrument with on board PLC and software for both field and lab protocols.  
Cooling block to hold 12 mm cuvettes with USB connection to unit for power.

### BIO2018P BioLight Toxy - Portable

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**Includes :** BioLight Instrument with on board PLC and software for field protocols without cooling block to hold 12 or 17 mm cuvettes. No rechargeable battery included.\*

*\*can be connected with external portable Power Station or wall plug for inside usage*

### BIO2018A Upgrade from BioLight Portable to Bench Top

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**Includes :** Cooling block to hold 12 mm cuvettes with USB connection to the unit for power.  
USB for adding lab protocols to the software.

### BIO2020 Cooling Block for 12 mm Tubes

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**Includes :** Cooling block to hold 12 mm cuvettes with USB connection to unit for power.  
*This item can only be acquired when the user has already purchased BIO2019L or BIO2018A.*

### BIO2021 Cooling Block for 17 mm Tubes (Solids Testing)

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**Includes :** Cooling block to hold 17 mm cuvettes with USB connection to unit for power.  
This item can only be acquired when the user has already purchased BIO2019L or BIO2018A.

### BIO2022 New User Reagent Package - Bench Top

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**Includes :** (1) BioLight Multi Test Reagent (10 vials), (1) BioLight Diluent (1 L), (1) BioLight Salinity Adjusting Solution (50 mL), (1) BioLight Recon (50 mL), (2) Boxes of 200 Disposable Glass Cuvettes.

**\*\* Only valid with the purchase of a new instrument**



## BIOLIGHT REAGENT & CONSUMABLES

BioLight reagent is manufactured using the marine bacterium *Aliivibrio fischeri*\* (NRRL B-11177). This strain of bacteria meets the ISO 11348-3 and has been used for over 30 years to measure toxicity in water, sediments, soil. It is sensitive to over 3,600 chemical compounds.

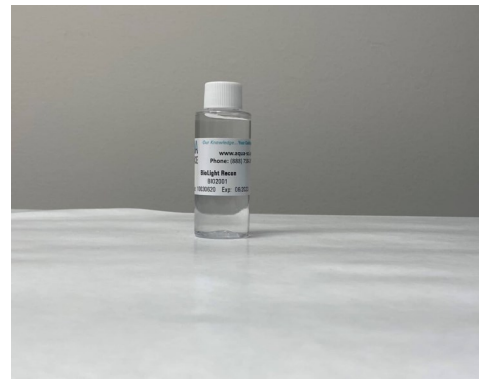


### BIOLIGHT REAGENT

- **BIO2006** BioLight Multi Test Reagent  
Freeze dried bacteria (10 vials/box)
- **BIO2007** BioLight Single Test Reagent  
Freeze dried bacteria (50 vials/box)

### BIOLIGHT RECON SOLUTION

- **BIO2001** BioLight Recon (50 mL)
- **BIO2005** BioLight Recon (1 L)



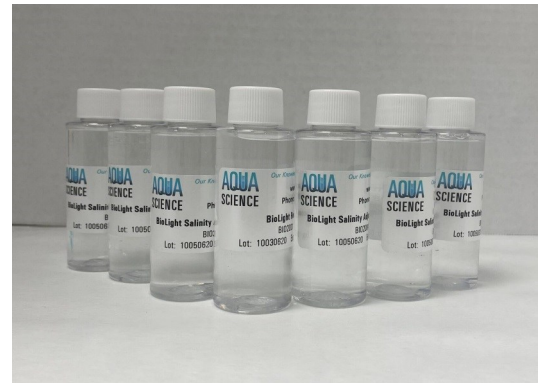
### BIOLIGHT DILUENT

- **BIO2002** BioLight Diluent (1L)
- **BIO2003** BioLight Solid Matrix Diluent (1 L)

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## BIOLIGHT SALINITY ADJUSTING SOLUTION

- **BIO2004**      **BioLight Salinity Adjusting Solution (50 mL)**



## BIOLIGHT ACCESSORIES

- **BIO2015A**      **Disposable Glass Cuvettes (200)**
- **BIO2016A**      **Disposable Glass Cuvettes (1000)**
- **RAW1035**      **10-100  $\mu$ L Pipet Tips**
- **RAW1036**      **100-1000  $\mu$ L Pipet Tips**
- **BIO2010**      **Extended Length Tips for Solid Phase**
- **BIO2011**      **Solid Phase Filter Column and Tubes (1000)**

## EXPLANATION OF USE :

**BioLight Reagent** is made of bioluminescent bacteria *Aliivibrio fischeri*\* used for acute toxicity testing. It is freeze dried for extended life then stored frozen at -20 to -25 C and is reconstituted before use with **BioLight Recon Solution**. A single vial of reagent contains approximately one hundred million cells.

The sample is salinity adjusted with **BioLight Salinity Adjusting Solution** to ensure a saltwater atmosphere due to *Aliivibrio fischeri* being a marine bacterium.

**BioLight Diluent** is used for dilutions as required for the protocol.

**BioLight Reagents** are produced under strict Quality Control and will include a Quality Certificate as per requirements of International Standard Organisation ISO 11348-3.

\* *rRNA comparison led to the reclassification from genus Vibrio fischeri to the newly created Aliivibrio fischeri in 2007. NRRL B-1177*





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