

# TOXI-SCREENING KIT

for ultra-rapid on-site toxicity screening of water

The tests are based on luminescence measurements with bacteria in a portable luminometer



Each kit contains all the materials and reagents required to perform low-cost toxicity analysis of 10 - 20 water samples

The luminometer and various additional items for test performance are enclosed in a small lightweight “Luminescence Measurement Case”



# TOXI-SCREENING KIT

## ultra-rapid on-site screening microbiotests for evaluation of the toxic hazard of waters

*The TOXI-SCREENING KIT is a “field test kit” containing all the materials and reagents required to perform toxicity screening tests on 10-20 water samples. Easy to follow instructions with detailed illustrations are provided within the kits for the conduct of the ultra-rapid field assays. The tests are based on the measurement of the bioluminescence produced by light emitting bacteria, using a portable luminometer.*

### **Test criterion**

- The natural bioluminescence produced by the luminescent bacteria is affected by toxicants. The decrease in luminescence of the bacteria upon a short exposure time (30 min) to a suspect water is measured in the luminometer in RLU (Relative Light Units). This is compared to the luminescence change in a (non-toxic) control water, for calculation of the percentage toxicity of the water sample.

### **Reproducibility**

- The freeze-dried luminescent bacteria and the reagents included in the test kit have been prepared in a strictly controlled procedure which precludes variability associated with the preparation of the test materials.
- The very simple procedures contribute substantially to a high precision of the assays.

### **User friendliness/Cost-effectiveness**

- The set up is very simple and the whole test procedure only takes one hour of time
- The assays can be performed in the field “anytime, anywhere”.
- The tests are performed “at ambient temperature” within the range 15°C to 25°C.
- All the materials included in the Toxi-Screening Kit are “low-cost” disposable items, which bypass tedious and time-consuming washing and cleaning steps subsequent to testing.

### **Contents**

- The Toxi-Screening Kit is composed of one box containing 10 vials of freeze-dried *Vibrio fischeri* luminescent bacteria and 10 boxes containing tubes already provided with reagents.
- Each vial with bacteria and each box with the tubes and reagents allows the user to perform independent toxicity screening assays on 2 water samples.
- The kit is provided with a detailed Standard Operational Procedure brochure, an abbreviated Bench Protocol, data scoring sheets and a specification sheet with the batch number of the bacteria and the reagents.

### **Shelf life**

- All the materials included in the Toxi-Screening Kit have a shelf life of 6 months up to one year.
- The vials with the freeze-dried bacteria must be stored deep-frozen (-18°C) until use.

### **Sensitivity**

- The change in bioluminescence upon toxic stress is “chemical dependent” and the sensitivity of the assay ranges from very high (a few ppb) for many compounds to much less (ppm) for others.
- The sensitivity of the assay is influenced by the natural chemical composition of the water (i.e. the amount of salts and ions). Overall, the higher the conductivity and the hardness of the water, the lower the detection threshold.

### **Supporting equipment**

- The portable luminometer and the items needed to perform the tests are enclosed in a small lightweight “Luminescence Measurement Case”.