



# Quick Guide

## MUG/MUD Kits

for *E. coli* or *Enterococci*

**Bathing Water** 2 dilutions

**Fresh Surface Water** 4 dilutions

**Waste Water and Treatment Plants** 6 dilutions



MUG/EC *E.coli* Transparent Microplates



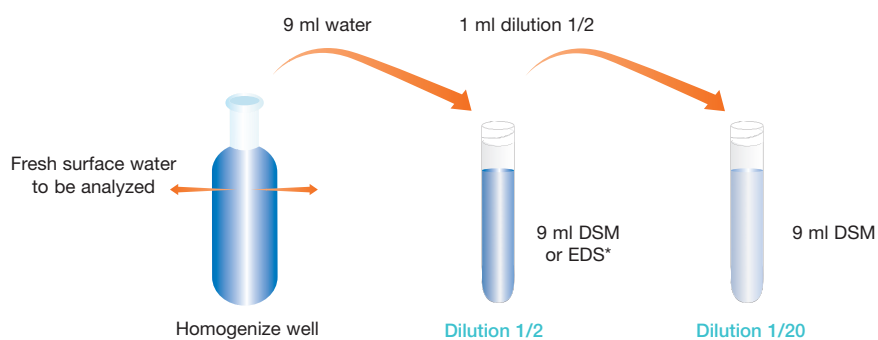
MUD/SF *Enterococcus* Transparent Microplates

355-3782/355-3785

355-3783/355-3786

**BIO-RAD**

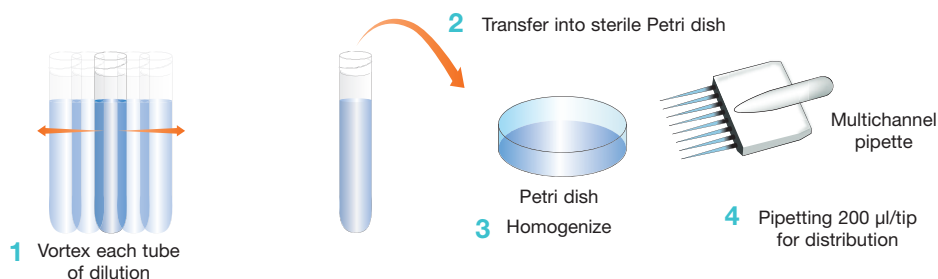
### 1 - Sample Dilution



**Caution:**  
Vortex each tube before each pipetting.

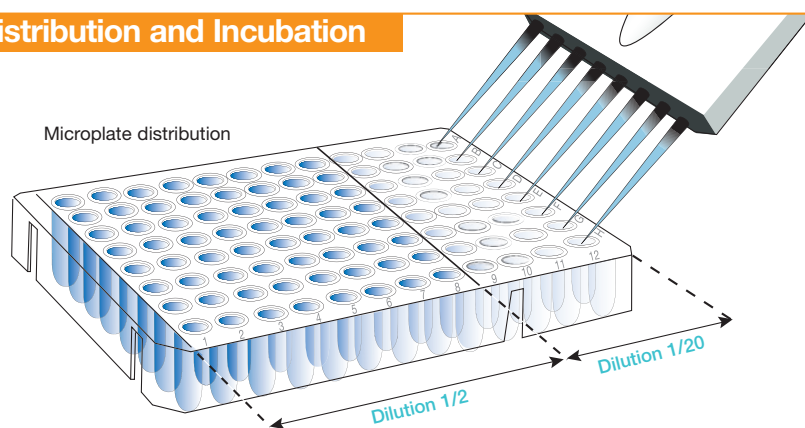
\*according to the rate of salinity

### 2 - Transfer into Petri Dishes for Pipetting

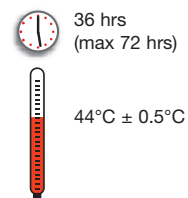


Repeat the operation for each dilution previously prepared.

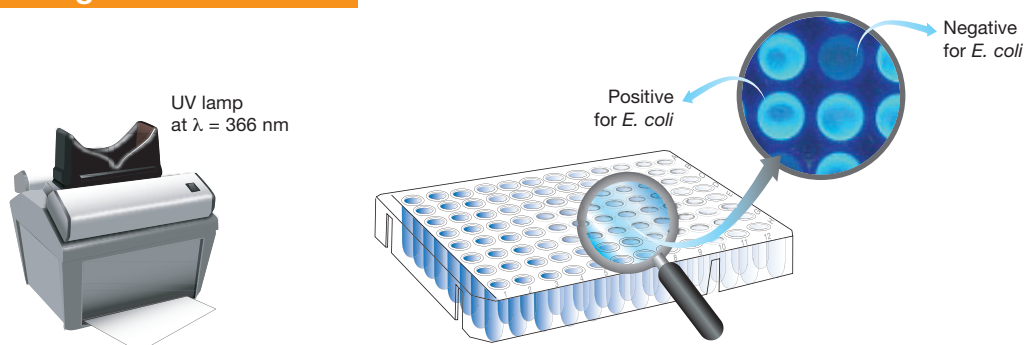
### 3 - Distribution and Incubation



#### Incubation



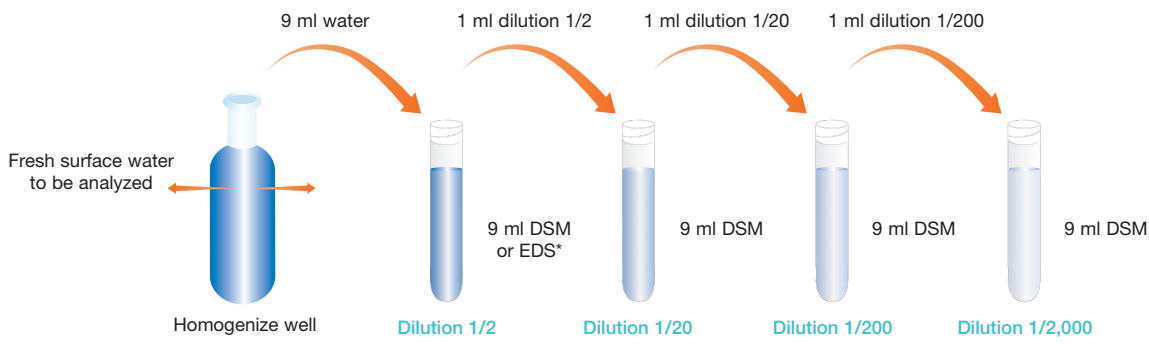
### 4 - Reading



Place each microplate, with the adhesive on, in the UV observation chamber. Consider all fluorescent wells as positive.

Please read the instruction manual for complete and detailed instructions.

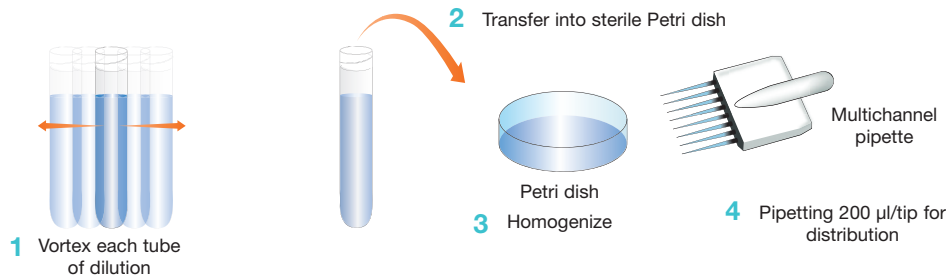
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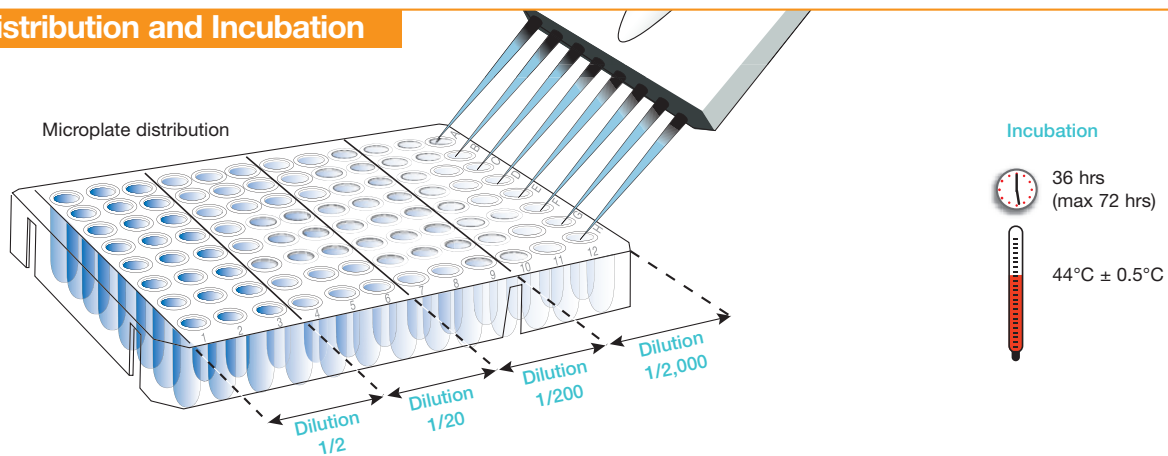
\*according to the rate of salinity

### 2 - Transfer into Petri Dishes for Pipetting

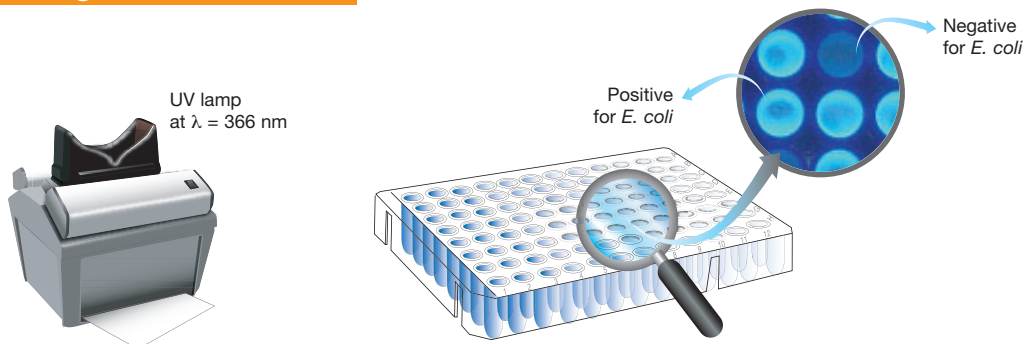


Repeat the operation for each dilution previously prepared.

### 3 - Distribution and Incubation



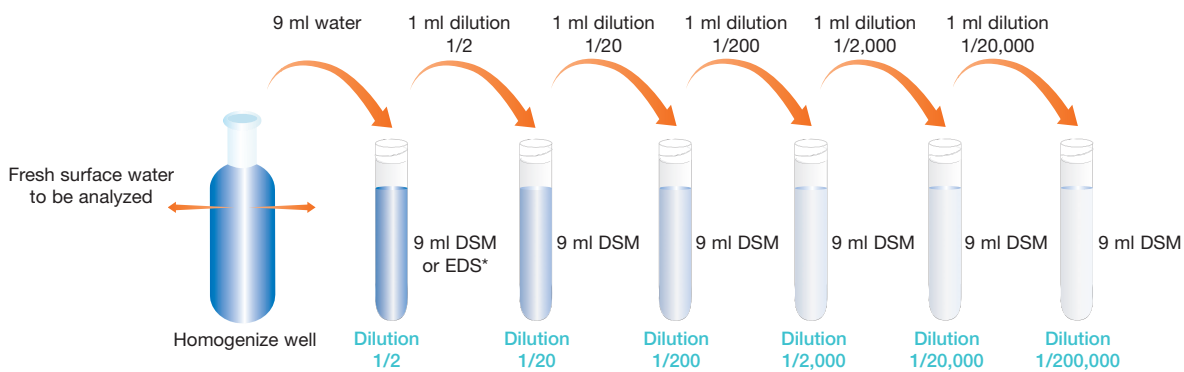
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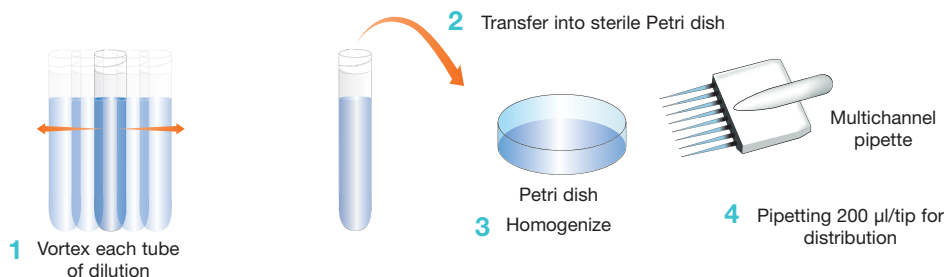
### 1 - Sample Dilution



**Caution:**  
Vortex each tube before each pipetting.

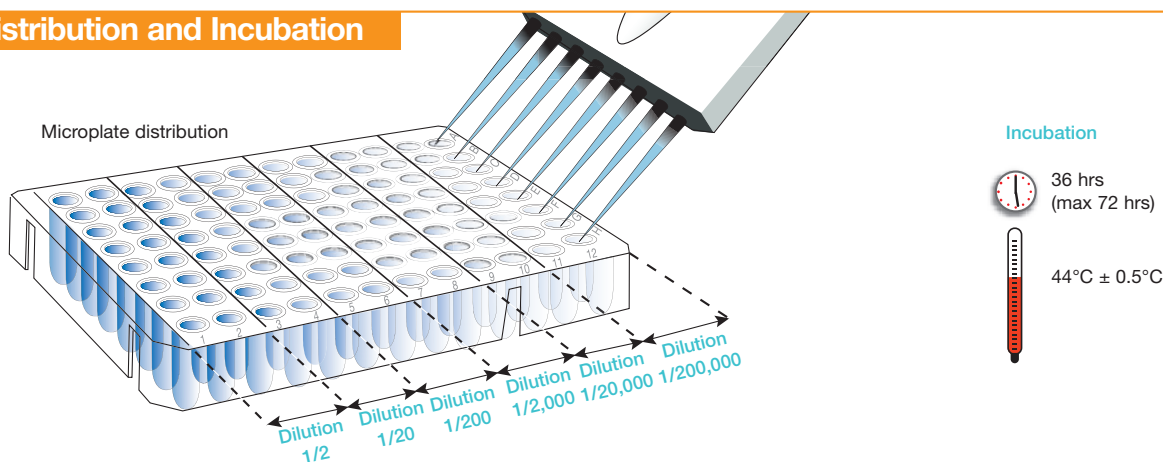
\*according to the rate of salinity

### 2 - Transfer into Petri Dishes for Pipetting

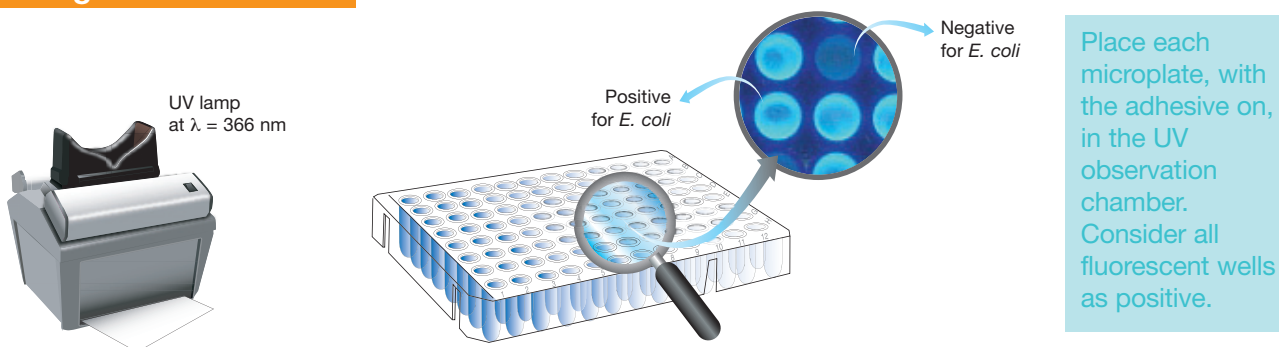


Repeat the operation for each dilution previously prepared.

### 3 - Distribution and Incubation



### 4 - Reading



Please read the instruction manual for complete and detailed instructions.

## 5 - Interpretation

### 1. Determination of the Characteristic Number (CN)

For each tested dilution, record the number of positive wells. When three or more dilutions have been inoculated, a characteristic number of three digits, the last one being zero where possible, shall be recorded in accordance with ISO 8199:2005. Each digit corresponds to the number of positive well(s) at the corresponding dilution.

### 2. Calculation of the MPN and its confidence interval

*NB: Before reading the MPN value and its confidence interval, ensure that you have chosen the appropriate statistical table according to the type of water and/or the presumed level of contamination of the water to be tested.*

The MPN (Most Probable Number) is a statistical estimation of the density of microorganisms, assumed to correspond to a Poisson Distribution in the volumes inoculated. Confidence intervals with a Lower limit (LO) and an Upper limit (UP) are attached to this MPN.

Statistical tables provided by Bio-Rad allow to determine the  $MPN_{\text{sample}}$  and its 95% confidence interval, in accordance with the NF EN ISO 9308-3 or NF EN ISO 7899-1 standards, from the recorded Characteristic Number (CN) and the corresponding dilutions.

If none of the wells is positive, express the result in following form: "< n/100 ml", n being the MPN for one positive well under the dilution conditions employed.

#### Example 1: 2 dilutions

Dilution	Number of positive well(s)
1/2	32/64
1/20	5/32

- Record 32/5 = CN
- Using the Table for 2 dilutions, CN = 32/5 corresponds to  $MPN_{\text{sample}} = 756$  bacteria/100 ml

$MPN_{\text{sample}} = 756$  bacteria/100 ml  
(LO = 542 bacteria/100 ml; UP = 1,054 bacteria/100 ml)

#### Example 2: 6 dilutions

$MPN_{\text{sample}}$  is estimated with the following formula (also appropriate for 4 dilutions):

$$MPN_{\text{sample}} = MPN_{\text{table}} \times d \times 100^*$$

\* MPN given from tables 4 and 6 dilutions, enables the calculation of the MPN of bacteria/ml of water. So to express the result/100 ml, a factor 100 has to be applied.

Dilution	Factor of dilution (d)	Number of positive well(s)
1/2	1	16/16
1/20	10	16/16
1/200	100	16/16
1/2,000	1,000	11/16
1/20,000	10,000	4/16
1/200,000		0/16

- $MPN_{\text{sample}}$ :
  - Record 11/4/0 = CN
  - Using the Table for 6 dilutions, CN = 11/4/0 corresponds to  $MPN_{\text{table}} = 13.86$  bacteria/1 ml
- d corresponds to the factor of dilution employed, picked out from the first digit of CN => in the current example: d = 1,000

The final results (MPN, LO and UP) in this example are:

$MPN_{\text{sample}} = 13.86 \times 1,000 \times 100 = 1,386,000$  bacteria/100 ml  
LO = 797,000 bacteria/100 ml  
UP = 2,411,000 bacteria/100 ml

Please read the instruction manual for complete and detailed instructions.

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*Life Science  
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