

One instrument – many possibilities: What you can achieve using ICC or TCC

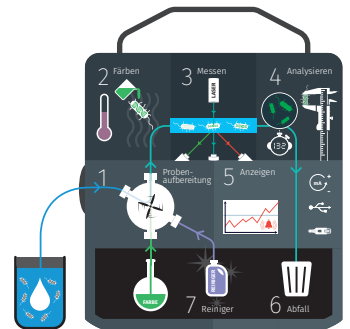
Some basics about flow cytometry

Flow cytometry is a technology used to precisely count bacteria since 1968. Many tests have shown that it is not only much faster (minutes instead of days), it is also very precise and counts all bacteria present in a water sample. This method is about to become **the new standard** for measuring water biological quality, and it will eventually replace the actual plating method HPC.

BactoSense™ is a fully automated flow cytometer.

The process starts with the water sampling, which can be automatic (when used online) or manual.

- As a first step, the dye is added to the water sample (1) and mixed to color homogeneously the DNA of each cell (2). After a 10-minutes incubation, the cell analysis can start.
- The specifically dyed bacteria are set to flow one cell at a time through a laser beam, emitting fluorescent light based on their DNA composition (3).
- A cutting-edge optical system detects and analyses different wavelengths for each cell found in the water sample (4), enabling the drawing of a precise dotplot (5).



What are the types of refills available for the BactoSense cartridges?

BactoSense can count either the total cells or the intact cells present in a water sample – in only 20 minutes and with 99.9% precision. To get fast and reliable results, bNovate's solution for bacterial water analysis incorporates a hermetically sealed cartridge, which can be filled to detect either TCC (Total Cell Count) or ICC (Intact Cell Count).

Cartridge concept – simple and safe

- **Autonomous up to 1000 measurements**
- **Safely includes chemicals**
 - Staining agents
 - Cleaning agent
 - Rinsing agent
- **Collects waste**
- **Fully hermetic**
- **One instrument, multiple cartridges**

Total Cell (TCC)

Intact Cell (ICC)

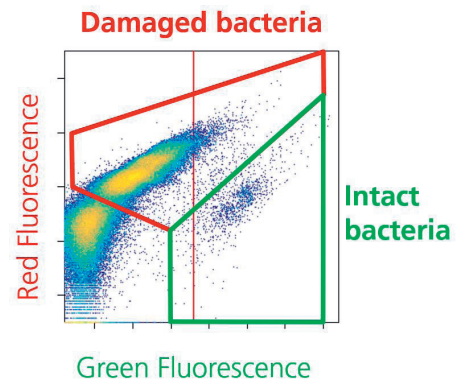
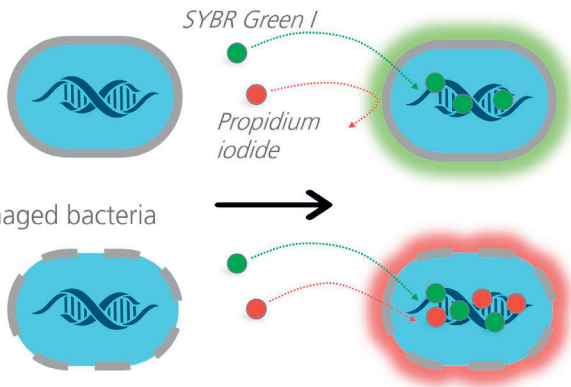
- **Sustainable**



ICC counts the intact cells

To be able to differentiate between intact (living) cells and damaged (dead or dying) cells, the ICC cartridge contains two different dyes: SYBR Green I (SGI) and Propidium Iodide (PI). While SGI is going to mark the DNA of every cell, PI can only enter cells with damaged membranes. As a result, intact cells will show only green fluorescence, whereas damaged cells will display both green and red fluorescence. Using a Flow Cytometer makes it possible to represent each point on a graph called dotplot. The last step is to set a gate where only intact bacteria will be taken into account, yielding an exact number of living cells present in the water sample.

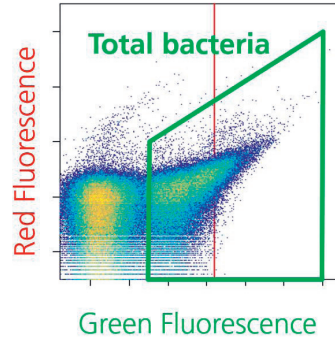
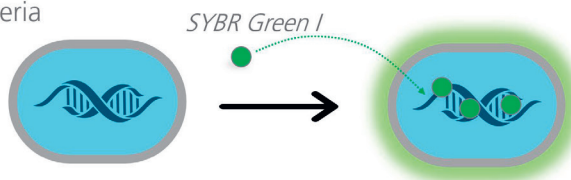
Intact bacteria



TCC displays the total number of cells

The concept of a TCC cartridge is the same, except that the filling only contains SYBR Green I dye. The DNA of all types of bacteria will be marked with green fluorescence, independently of the state of their membrane. By setting the gate on the dotplot, the total number of cells that are present in the analyzed water sample will be known.

Bacteria



How to decide whether to use ICC or TCC

bNovate will recommend which type of cartridge to use depending on your application's needs. If you choose ICC or TCC and notice that the other type of cartridge fits better after a while, we've got you covered: the cartridge filling can be changed anytime. As a result, switching from ICC or TCC to the other one is very simple.

Generally, **TCC** is used for a **global view of the system** (e.g., groundwater measurements where the background matters, surface water with interesting background contribution, karstic water loaded with inorganic matter), while **ICC** is **focused on the intact cells** (e.g., monitoring in the absence of a background, process water to verify disinfection steps).

For personalized advice, we invite you to contact your bNovate representative.

bNovate Technologies SA

Ch. Dent d'Oche 1A · CH-1024 Ecublens

Tel. +41 (0)21 552 14 21

info@bnovate.com · www.bnovate.com

© 2022 bNovate Technologies SA, Switzerland, all rights reserved