

Factsheet: ICC Kit

Intact Cell Count (ICC) Kit Specifications

Sample volume	1 mL
Target cells	All viable bacteria
Time to results	Fastest possible (ICC 1 min): First result in 22 minutes. All 8 results in 33 minutes.
Limit of detection (LOD)	ICC 1 min: 50 cells/mL, e.g. Drinking water ICC 3 min: 20 cells/mL, e.g. Clean water ICC 10 min: 10 cells/mL, e.g. Purified water
Sensitivity	> 99%
Specificity	> 98%
Quantitative working range (without dilution)	ICC 1 min: 150 - 5,000,000 cells/mL, e.g. Drinking water ICC 3 min: 60 - 5,000,000 cells/mL, e.g. Clean water ICC 10 min: 30 - 5,000,000 cells/mL, e.g. Purified water
Typical test matrices	All types of water (potable, process, env.); Beverages incl. soft drinks, juices, after brief sample preparation; Liquid cultures

Intact Cell Count (ICC) Kit Facts

Unit of results	Number of viable cells per 1 mL
Main steps in the workflow	Add 1 mL sample to reaction tube, await 15 minutes reaction time, add sample to cartridge and start analysis
Daily throughput	Up to 200 samples per day per rqmicro.COUNT instrument.
Main areas of application	Microbial control in F&B production, cooling tower monitoring, aquaculture (RAS), microbial monitoring in water treatment plants, wastewater reuse, water safety concept, applied research
Regulatory status of the test kit	Quantification of intact cells using flow cytometry is well covered in academic literature and has become part of internal routine testing protocols in industry. The production of the test kit is in scope of the ISO 9001 Quality Management System of rqmicro.
Comparison rqmicro test results versus cultivation-based test results	Heterotrophic Plate Count (HPC) generally detects a variable fraction of 0.1% - 1% of viable cells in a sample because only a fraction of cells grows in culture media. The large majority of cells in water are viable but non-culturable cells (VBNC). The rqmicro test results are independent from bacterial growth, include VBNC cells, and are therefore much more precise than cultivation-based test results.
Comparison rqmicro test results versus PCR-based test results	PCR is not able to unspecifically count all viable cells due to technological limitations.
Laboratory equipment required	Pipettes (single-use pipettes can be included in the rqmicro ICC Kit), vortex mixer
Shelf life	2.5 years
Storage conditions	Room temperature. Avoid direct sunlight. Store in cool and dry place.

General Method Description

Technologies used in the rqmicro test method	Specific or unspecific labelling of bacterial cells with staining dyes and subsequent quantification of cells using cartridge-based flow cytometry. Depending on the test kit, the rqmicro method can include cell concentration (filtration), immunomagnetic separation of target cells and/or additional staining to detect membrane integrity.
Laboratory or on-site	Both is feasible using the rqmicro.COUNT instrument. Specific tests (Legionella, E. coli) require additional equipment for sample preparation.

Frequently Asked Questions

How do I check test results?	Test results are immediately available on the rqmicro.COUNT instrument and on rqmicro's Cloud Solution.
How do you assure the safety of data on the Cloud Solution?	Data produced by rqmicro.COUNT instruments is securely hosted in Europe using market-leading hosting services by Amazon Web Services (AWS). All software services provided by rqmicro are covered by the ISO 9001 quality management system.
How does the method differentiate between live and dead cells?	Flow cytometry is able to assess the viability of single cells at a very high throughput of up to 10,000 cells per second. Membrane-damaged, and therefore, dead cells produce an additional signal that enables a differentiation from viable cells with intact cell membranes.
Could rqmicro rapid test give a positive result whilst the culture test gives a negative result?	Yes, because the rqmicro test also quantifies viable but non-culturable cells (VBNC) which are not detected in cultivation-based methods. Results obtained with the single-cell counting technology deployed in rqmicro.COUNT instruments are therefore more precise and often result in higher cell numbers when compared to cultivation-based tests.
Is the process automated?	Sample preparation takes 1-5 minutes hands-on-time per sample, depending on the test (ICC, TCC, Legionella, E. coli). The analysis on rqmicro.COUNT is fully automated.
Does rqmicro provide training?	New rqmicro.COUNT customers typically receive a 1 day training on the instrument and benefit from continued support by rqmicro Application Specialists.
Does rqmicro provide service contracts?	The rqmicro.COUNT Service Contract offers instrument service, extended warranty, software packages and continued application support for recurring test kit customers.



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