CytoQuant®

Instructions for the Testing of Surfaces

1. Scope

The instructions provided in this document are applicable for the testing of various surfaces within the food supply chain, especially those presenting a higher food safety risk. Depending on the surface type (regular or irregular), users may choose between a quantitative and a semiquantitative testing approach. Semi-quantitative testing is generally adequate for monitoring purposes.

Surfaces should not be visibly soiled, as samples tested with the CytoQuant® instrument are required to have low levels of contamination with particulate matter. Therefore, testing is most appropriate for the monitoring of sanitation (cleaning and disinfection).

2. Equipment and consumables

Supplied by Romer Labs:

- CytoQuant® flow cytometer (#10006469), including CytoQuant® CountCell™ (#10006471)
- CytoQuant® Swab Vial (#10006468)
- Sampling template (#10003780, #10003786) – for the quantitative testing of flat surfaces

3. General remarks

The microbiological testing of surfaces is especially challenging, as the uptake of microorganisms by swabs is uneven. Therefore, it is critical that sampling is carried out in a consistent manner and that swabbed areas are representative for the tested surfaces.

Adequate contact between the swab bud and the surface is required to guarantee effective loading of bacteria and other particles. In the case of irregular surfaces, the swabbed area should be large enough and it should include gaps and other potential harborage spots. Excessively wet surfaces (*i.e.*, having a continuous film of water) should be avoided.

When testing with the purpose of monitoring sanitation, sampling can be done both before and after disinfection. Traces of commonly used chemicals do not impact the accuracy of measurements.

The time between sampling and analysis should be as short as possible – preferably less than 8 *h*, but not longer than 12 *h*. Samples that are not tested within 45 minutes from sampling should be kept cooled (2-8 °*C*).

4. Procedure

Testing follows a simple workflow (see page 2) that involves sampling the surface of interest, by employing either a quantitative or a semiquantitative swabbing technique, and then directly analyzing the sample with the CytoQuant® flow cytometer.

<u>Semiquantitative testing (all surface types)</u>

Swab an approximate area, while making sure its size does not vary significantly throughout the monitoring period. For optimal result consistency, we suggest selecting an area size of 20 *cm* × 20 *cm* (8 *in* × 8 *in*).

<u>Quantitative testing (regular surfaces)</u>

Swab an area with a known size, preferably not larger than 10 *cm* × 10 *cm* (4 *in* × 4 *in*). If the surface is flat, use a sampling template.

5. Expression of results

<u>Semiquantitative testing</u>

Use the default result as displayed by the CytoQuant® instrument (*intact cells* or *particles* per *mL* of buffer).

<u>Quantitative testing</u>

Calculate N, the number of *intact cells* and/or *particles* per surface area unit (cm^2 or in^2), using the formula below.

$$N = 3\frac{n}{A}$$

where:

n – number of *intact cells* or *particles* per *mL* of buffer (default result as displayed by the instrument)

3 – *mL* buffer in CytoQuant® Swab Vial (3 *mL* ± 2%)

A – swabbed surface area size, expressed in surface area units (cm^2 or in^2).

General Workflow

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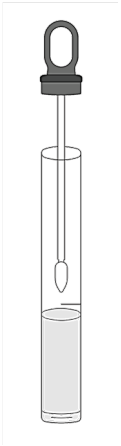
Open the vial by twisting the handle-cap counterclockwise, then draw the swab from the buffer. Touch the inner wall of the vial to drain off surplus liquid.



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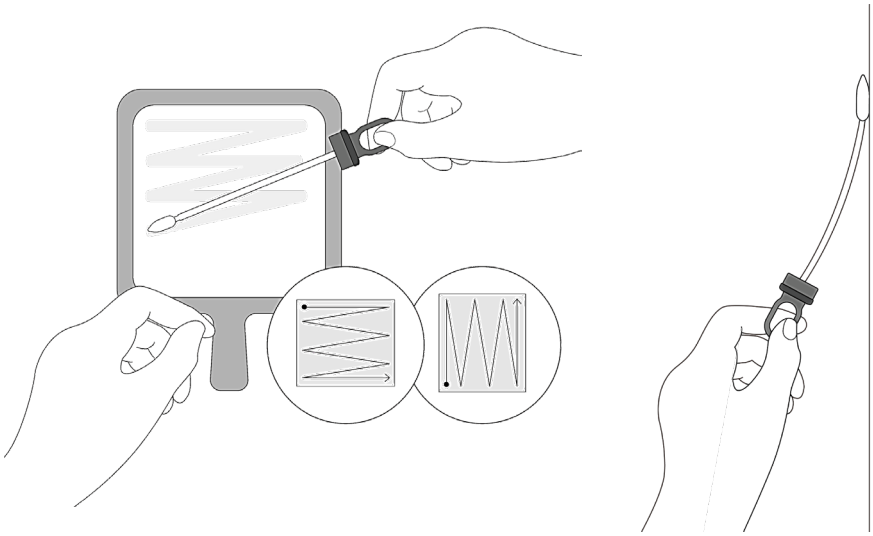
Swab the targeted surface meticulously. For quantitative tests, use a sampling template. **Swab in a crisscross pattern**, horizontally and vertically, **reversing the swab when changing direction**. While swabbing, make sure to **apply sufficient pressure so as to flex the swab stick**. Always hold the swab stick by the handle-cap.



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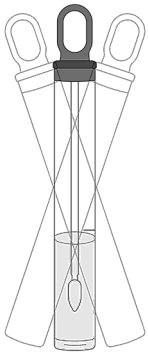
Return the swab stick into the vial, close the vial, and **mix the test portion well by shaking the vial horizontally**. Up and down movements will cause excessive aeration of the liquid.



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Insert the vial into the CytoQuant® instrument and select the preferred measuring program.