



Filtration Membrane Efficiency on ScanStation

Where Are Filtration Membranes Used?

Filtration membranes are thin, circular filters designed to retain microorganisms present in a volume of liquid or air as they pass through the membrane. These membranes are available in various materials, including cellulose acetate, cellulose nitrate, polyethersulfone/PES, and polycarbonate. They also come in specific pore sizes, typically 0.2 μm or 0.45 μm , depending on the size of the microorganisms being analyzed.

After filtration, the membrane is placed on a Petri dish containing a growth medium, allowing the microorganisms to grow into visible colonies for enumeration.

Filtration membranes are used in various applications, with two primary categories being Quality Control (QC) Testing and Environmental Monitoring (EM):

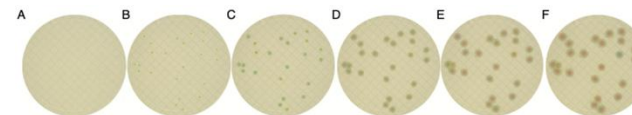
- **Quality Control (QC) Testing:** QC tests verify whether a product or raw material complies with regulatory standards.
 - In the **food and beverage industries**, these tests involve enumerating microorganisms in the product to ensure their quantity complies with regulations. Pathogen detection is also performed.
 - In the **pharmaceutical and cosmetic industries**, most products are required to undergo sterility testing, except for products intentionally containing microorganisms, such as probiotics.
- **Environmental Monitoring (EM):** EM monitors microbial loads in controlled environments, such as laboratories or production lines.
 - This testing is primarily conducted in **pharmaceutical manufacturing facilities** but is also applicable to other industries requiring strict environmental control.
 - EM analysis involves **air sampling in cleanrooms, surface monitoring of equipment, walls, or workstations, and water system testing** for microbial contaminants (e.g., *Legionella* in cooling towers).

Other applications of filtration membranes include **general water quality testing**, such as monitoring **drinking water, recreational water** (e.g., pools), **industrial water, wastewater**, and **natural water sources** (e.g., rivers and lakes) for **environmental surveillance**.

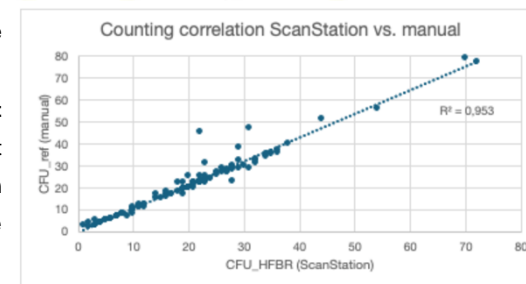
Recent Study on ScanStation Performance Using Filtration Membranes

Interscience R&D department recently conducted a study to evaluate the performance of the ScanStation for analyzing filtration membranes. The study tested various membrane types (PVDF, Cellulose MCE, Cellulose MCE with grid, Cellulose CA, PES) and strains (*Escherichia coli*, *Pseudomonas aeruginosa*, *Ralstonia pickettii*, *Stenotrophomonas maltophilia*, *Sphingomonas paucimobilis*, *Candida albicans*).

This study highlights the performance of the ScanStation when using white filtration membranes. For 113 samples on four different white membranes, the ScanStation demonstrated an enumeration accuracy ranging between 90% and 99% (PVDF = 99%, MCE = 97%, CA = 91%, PES = 90%).



These results are illustrated by the following correlation graph, which shows a correlation coefficient (R^2) of 0.95. This indicates that there is no significant variation between manual reference counts and ScanStation counts.



Therefore, even for white colonies, it is recommended to use white membranes. This improvement is attributed to the upgrade the ScanStation counting algorithm of the new software version.

The application note referred to in this Appli'News is available on the Interscience website (title: SCANSTATION COUNTING PERFORMANCE ASSESSMENT ON FILTRATION MEMBRANE).