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Safer Water Circulations With Microbial Measurements

Nowadays, water circulations in industrial processes are increasingly vulnerable to microbial challenges. Environmental awareness and economic efficiency imply a tendency towards more closed water circulations, more moderate process temperatures and lower biocide usage. These all favor microbial growth with many adverse consequences.

Many bacteria produce slime, increasing system viscosity, decreasing flow rates and resulting in extended wear in pumping stations. Also other material present in process waters prone to attach to microbial slime further increasing flow resistance.

Microbes also attach to metal surfaces forming biofilms. Biofilms protect microbes from all kinds of controlling actions: they become much more resistant to washing procedures and biocide control. Microbiological fouling of circulation systems creates highly insulating surface covers and thereby effectively blocks heat exchange.

Furthermore, bacterial biofilms induce corrosive processes via their metabolites and thus increase maintenance needs.

Biofilms also provide a suitable environment for pathogenic organisms, especially for Legionella. It is hence essential to understand microbial dynamics to guarantee occupational safety and safe maintenance of the water systems.

Rapid and easy standard service

Savcor QuantiFire offers service packages to analyze the microbiological status of process waters. The service provides information on microbial numbers and risks related to biofilm formation, corrosion and occupational health. In addition, the results often indicate potential origin of microbial contaminants, and thereby help to control their growth.

QuantiFire standard service package includes 10 individual analyses covering total number of bacteria as well as main biofilm-forming, slime-producing, spore-forming corrosion-inducing bacteria and the most relevant pathogens in typical process waters. This package helps clients to understand and manage the microbiological conditions of the water circulation process. The service is provided in easy format. The client requests a number of sample vials. Sample vials typically arrive within couple of days and can be directly sent back to QuantiFire after sampling. The analyses are carried out and reported to client by e-mail.

Complete characterization of microbes in client process

Differences in raw waters, process conditions and microbial control protocols make every process unique. Consequently, unique microbial contaminants prevail in each process. Clients who want to understand in detail microbial dynamics in their specific process benefit from Savcor QuantiFire complete analytical service package, which includes complete characterization of process microbes, tailored panel and specific sampling protocol.

In complete characterization of process microbes, QuantiFire applies taxonomic sequencing technology on client process samples, enabling species level identification of every microbe in the process. Thereafter, an optimal quantifying method is selected and designed for 10 most important microbial species or clusters. Adjustment and development of the methods to meet client needs is carried out using QuantiFire assay design platform. A specific sampling protocol including relevant analyses is implemented into client process to enhance process hygiene maintenance.

Advantages of QuantiFire technology

Savcor QuantiFire has a proprietary sample storage and delivery technology. It stabilizes the microbiological samples at ambient temperature and thereby allows delivery of samples via ordinary postal services. Therefore, clients can pre-order sample vials from QuantiFire, collect samples when most convenient and send them to QuantiFire without needing to be troubled of sample spoilage.

Microbial quantification is based on real-time PCR. Over 15 year of continuous development of PCR methodology by QuantiFire ensures highly accurate and reliable results.

QuantiFire exploits laboratory automation, and therefore results are available typically within 48 hours from the sample delivery. Even faster schedules are available on request.

Why is it important to follow microbes in water systems?

Process and cooling water systems imply an occupational risk, especially under maintenance periods. Even small leaks or aerosols can contaminate the whole plant, including the end products.

More global operational framework with a wide variety of raw materials continuously induces new potentially pathogenic microbes into water circulation systems. An example of this is a Chlamydia-related respiratory pathogen recently isolated from Spanish process water systems. These new pathogens result in unforeseeable consequences to occupational safety.

Microbial growth can cause significant destruction in the system both through corrosive processes and slime formation damaging the pumps. Effective controlling actions require microbiological knowledge and analytics.

Even though biocides are an effective way to control microbial growth, they are often used non-optimally when their usage is not based on relevant microbiological analyses. In the worst case, selected biocides can even enhance microbial growth if the selection is carried out without knowledge on process microbiological status.

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