

Optimizing Biopurity in Purified Water for Medical Rinsing

Increasingly stringent standards (prEN15883, HTM2030/2031) have focused attention on the need to reduce risks of microbial and endotoxin contamination from rinse water and thus minimize the chances of cross-contamination and secondary infection.

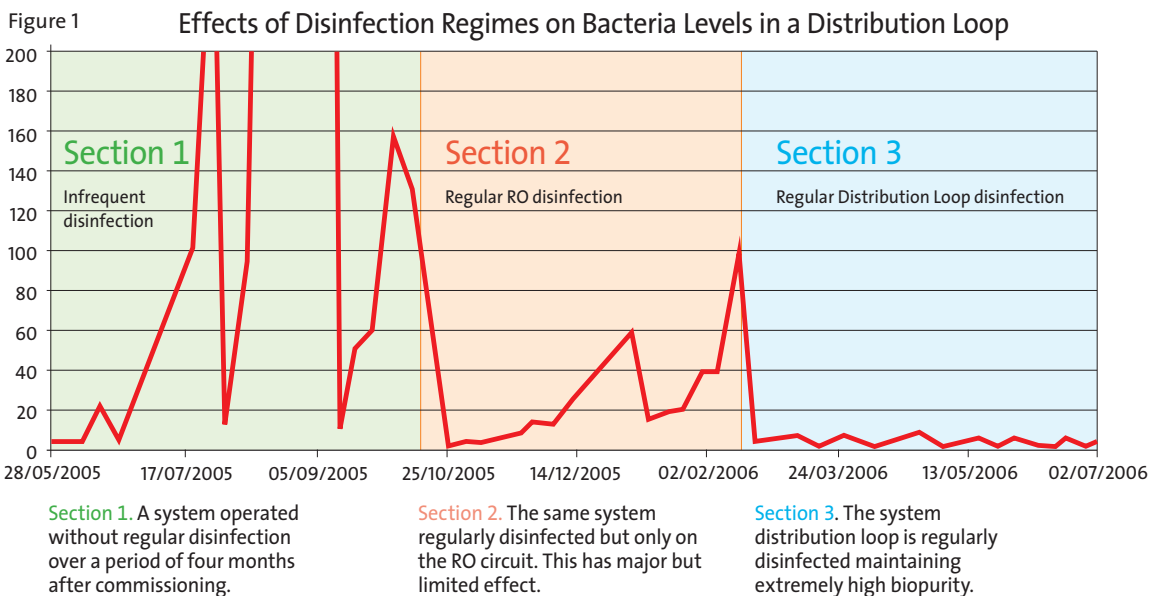
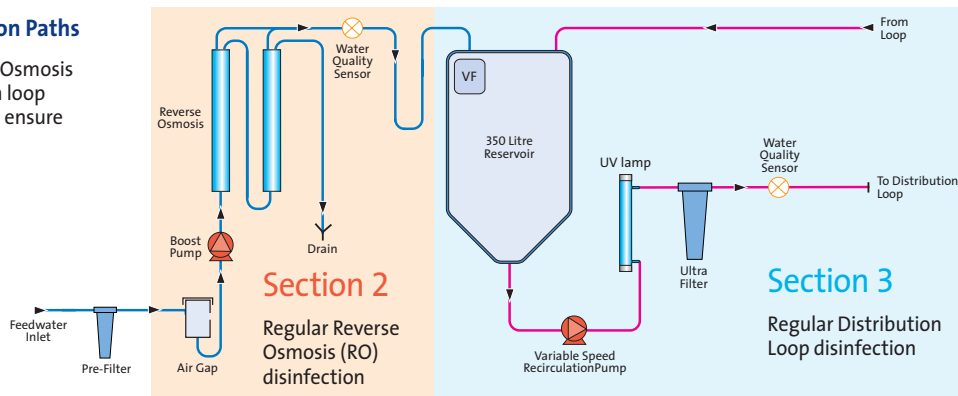
“Biopurity on day-one” is relatively easy; the challenge is to design a system that offers long-term biopurity. Such a system must provide the necessary purification stages, monitoring, effective and easy disinfection/sanitization procedures.

The key to long term biological purity is disinfection, and any attempt to avoid regular disinfection has been condemned as high risk by authorities in this area.

CLSI guidelines (4th Edition 2006) states **“Biofilm will develop at any flow rate and sanitization is the only way to combat it”**. Without regular disinfection a biofilm will be established within the system and provide a permanent source of bacteria, along with endotoxins and organic contamination (refs 1 – 5). An example of the effects of disinfection can be seen below.

Biopure Disinfection Paths

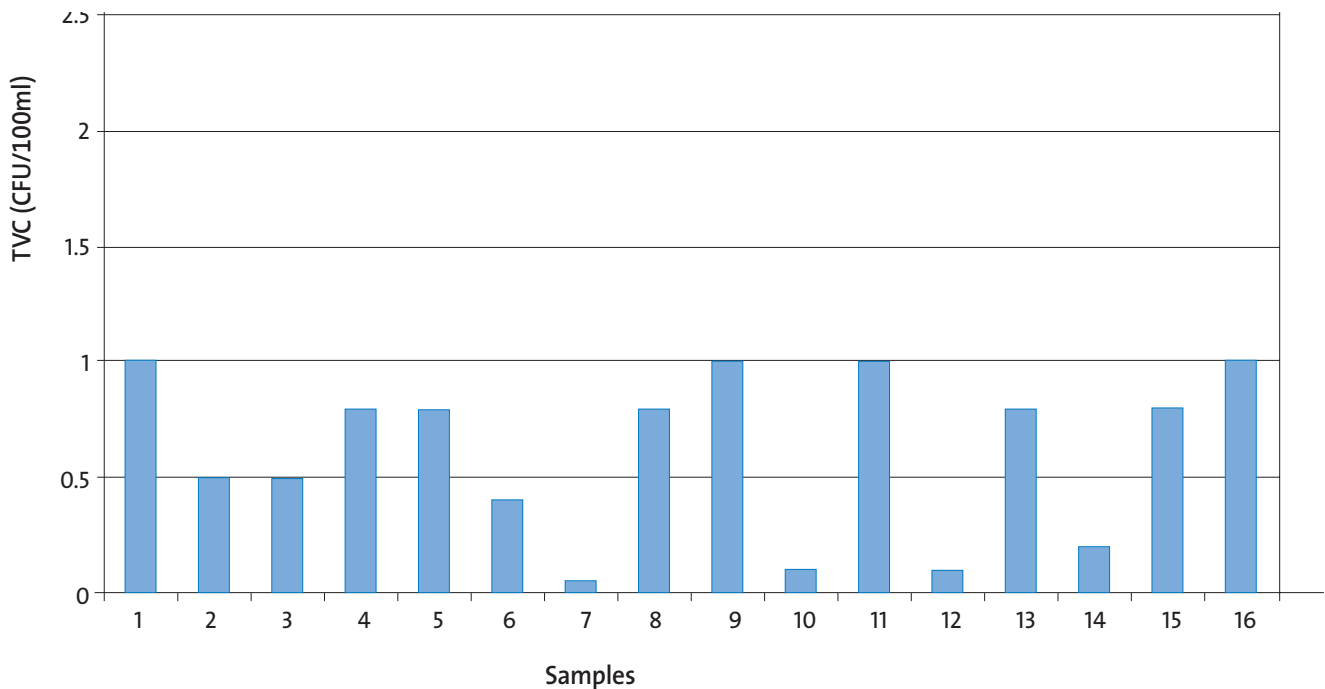
The Biopure Reverse Osmosis (RO) and distribution loop can be disinfected to ensure ongoing biopurity.



TECHNOLOGY NOTE 10

Analyses performed in our research laboratories on samples from an ELGA LabWater Biopure water system, found bacteria levels of 1 CFU/100ml or less within a distribution loop over a six month period. The system and distribution loop were operated and disinfected according to ELGA LabWater recommendations.

Bacteria in a Biopure Distribution Loop



Conclusion

Relying upon water purification technologies alone will not achieve the levels of microbial purity required by today's standards. A system must be designed to facilitate ease of disinfection on a regular basis to ensure optimum biopurity. Such a regime along with good system design prevents the establishment of significant areas of biofilm. This has led to Biopure systems typically giving bacterial counts of 1 CFU/100ml or less.

References

- Ref 1* Preparation and Testing of Reagent Water in the Clinical Laboratory – 4th edition CLSI 2006
- Ref 2* Costerton JW, Stewart PS Battling Biofilms Sci. Am. 2001; 285(1); 74-81
- Ref 3* Costerton JW, Stewart PS, Greenberg EP Bacterial Biofilms: a common cause of persistent infections. Science 1999; 284(1); 1318-22
- Ref 4* Purevdorj-Gage LB, Stoodley P. Biofilm structure, behaviour and hydrodynamics. In: Ghannoum M, O'Toole GA, eds. Microbial Biofilms, Washington DC; ASM Press 2004
- Ref 5* Traeger H. Microbial control: how to protect against biofilm build-up in loops and tanks. Ultrapure Water 2005; 22; 24-30

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