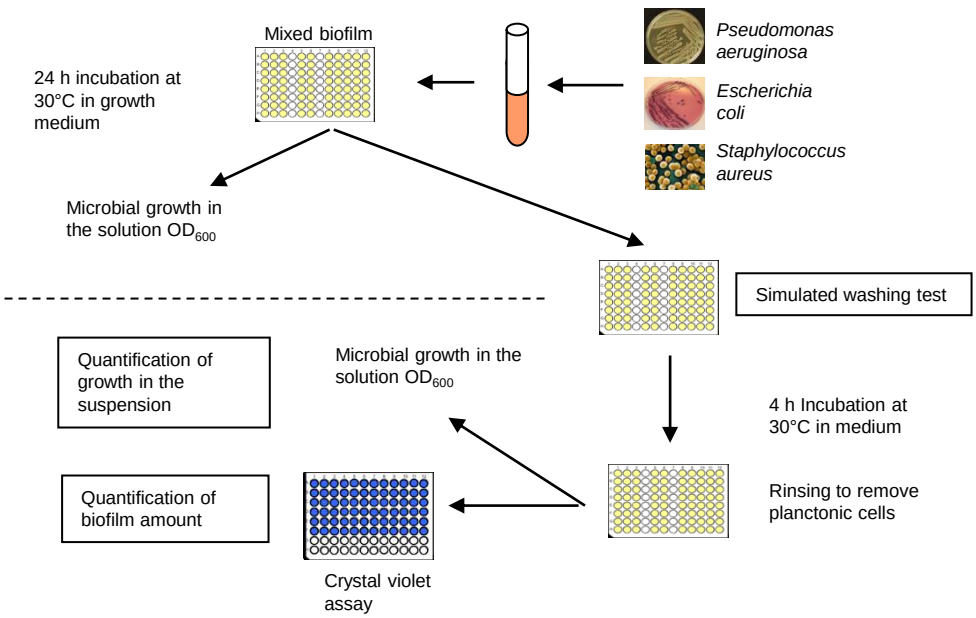
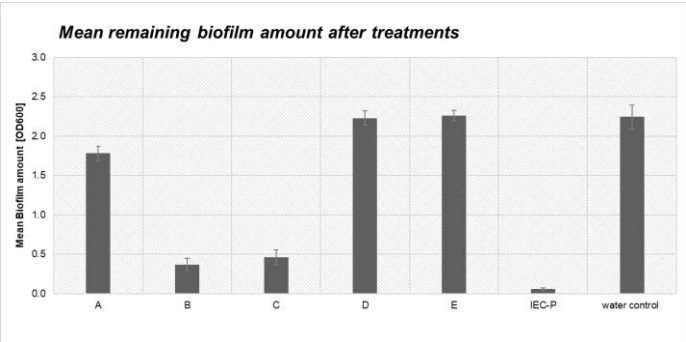
A LAB-SCALE METHOD TO ASSESS THE IMPACT OF WASHING PARAMETERS ON BIOFILM FORMATION

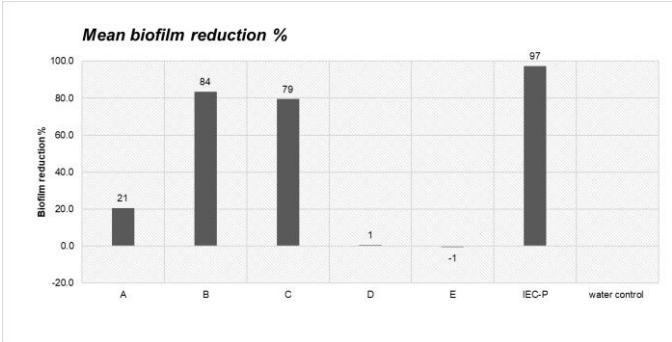
*Biofilm formation in washing machines is a problem resulting in malodor of the washing machine and the freshly washed textiles. Furthermore, potential pathogenic germs can proliferate and form a potential health risk for sensitive people like the so-called YOPIs (**Y**oung, **O**ld, **P**regnant and **I**mmuno-compromised). Biofilms are very difficult to remove once they have established on a surface. On the other hand, biofilm formation can not totally be avoided in a humid and nutrient-rich environment like a washing machine. A biofilm control strategy is needed.*
The aim of the lab-scale test system, is to test the impact of single or combined parameters like water hardness, detergents, soil levels, temperature etc. on biofilm formation, is a very flexible and cost saving screening test system.

***Lab-scale test method:** The test microorganisms P. aeruginosa, E. coli and S. aureus are cultured and a mixed test germ solution is prepared. A multispecies biofilm is grown in a 96-well plate for 24 hours at 30°C. Afterwards a simulated washing test, repeated simulated washing tests or a treatment with a washing machine cleaner or a detergent can be performed to test the efficiency of a process or product against biofilms. The biofilm amount is determined by the crystal violet assay of O'Toole (2011). The amount of bound blue dye on the biofilm (crystal violet) gives a qualitative result for the remaining organic matter (live and dead biofilm cells and biofilm matrix).*



***Lab-scale test method – results:** The removal of a mixed biofilm is expressed as % of reduction of biofilm amount in comparison to a water control. Washing machine detergent B, C and IEC-P were most effective in terms of biofilm removal in comparison to the water control.*





Literature

G. A. O'Toole (2011). Microtiter dish biofilm formation assay. J Vis Exp. 2011, Jan 30, 47, 2437

Swissatest Testmaterialien AG, Mövenstrasse 12, CH-9015 St. Gallen, phone +41 71 311 80 55, swissatest.ch