CLEANING AND DISINFECTION OF STAINLESS STEELS

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ABSTRACT

Inert stainless steels of various kinds are used in thousands of applications, including domestic, engineering, food and drink and medical environments. It is widely recognised that environmental surfaces can act as reservoirs for microbial fouling and that effective cleaning and disinfection regimes employed are essential for removing product deposits and microbial populations. Cleaning regimes can often involve the use of large quantities of water, energy and chemical agents and costs time which has an impact economically. In recent years there has been a drive to minimise water and energy consumption and to make cleaning procedures more environmentally friendly. Research into alternative materials such a copper, brass, zinc, aluminium, silver and polymers containing antimicrobial agents has challenged the dominant status of stainless steel. However, stainless steel remains an effective inert, hard and cleanable surface. Due to the emergence of new pathogens and the development of novel sanitizers, existing information on the most effective disinfection approaches are not commonly reported and little recent information on bacteria elimination from surfaces in this context is available.

The aim of this study is to design a common methodology using model surfaces to enable comparison of surfaces and cleaning/disinfection regimes, and recommendation of the most appropriate approach. Variables including surface (and cell) hydrophobicity, surface preparation and ageing, surface finish, type of soil, choice of microorganisms, biocontamination method and cleaning/disinfection product(s) will be explored. Surfaces will be subjected to successive soiling and cleaning runs to condition the surface making it representative of a surface which has been used and been subject to surface modification and the effects on cleanability will be investigated. Further into the study, different types of surfaces and topographies and cleaning agents will be investigated and the performance of stainless steel compared to competitor materials (which may be antimicrobial). The data generated will enable optimisation of cleaning procedures which will be important to improve economic efficiency, decrease damage to the environment and ensure best hygienic practice.