Influence of surface roughness of stainless steel on microbial adhesion and corrosion resistance - DTU Orbit (20/08/2019)

Influence of surface roughness of stainless steel on microbial adhesion and corrosion resistance

Abstract The aim of this study was to evaluate if hygienic characteristics of stainless steel used in the food industry could be improved by smoothing surface roughness from an Ra of 0.9 to 0.01 µm. The adherence of Pseudomonas sp., Listeria monocytogenes and Candida lipolytica to stainless steel was not affected by surface roughness (Ra) ranging from grit 4000 polished stainless steel (Ra <0.01) to ground stainless steel (Ra 0.9). Neither adhesion of Ps. aeruginosa nor its removal by an alkaline commercial cleaner in a flow system was affected by surface roughness. Pitting corrosion resistance was evaluated in a commercial disinfectant and in 1 M NaCl. Electropolished and grit 4000 polished steel proved more corrosion resistant as opposed to grit 80 and 120 polished surfaces. In conclusion, the surface finish did not influence bacterial attachment, colonisation, or removal, but is an important parameter for the corrosion resistance of the surface.

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