

## **SURFACE MODIFICATION TO REDUCE DAIRY FOULING**

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### **ABSTRACT**

Surface modification, for example through the application of a surface coating, potentially provides a solution to mitigate fouling and/or improve cleaning in a number of industrial applications. Such surface modification may alter one or more surface properties including surface roughness, surface free energy, wettability and surface charge. It is expected that altering these surface properties may influence the deposit adhesion and fouling deposition behaviour. The literature suggests that lowering of surface energy promotes reduction in fouling deposits. However, conflicting results have been reported for hydrophobic surfaces. This study aims to investigate and clarify this apparent contradiction through the assessment of fouling on modified surfaces for use in the dairy industry.

Stainless steel surfaces were modified by the deposition of doped diamond-like carbon (DLC) films. The fouling behaviour of the coated surfaces in contact with milk was investigated using a laboratory scale Flow Tube and Disk Fouling Rig. This work will present the fouling behaviour of these modified surfaces in comparison to the non-modified, traditional dairy plant stainless steel surface in terms of the combined effects of both protein and mineral deposition, and discuss the results in terms of the effect of the coating surface properties on the initial interaction with the fouling species.