

A TECHNO-ECONOMIC ANALYSIS OF THE PERFORMANCE OF ANTIFOULING COATINGS IN FOOD INDUSTRY HEAT EXCHANGERS

Leonardo Gomes Da Cruz^{1,2}, Edward Ishiyama³, Wolfgang Augustin⁴, Stephan Scholl⁴ and Ian Wilson^{1,*}

¹*Department of Chemical Engineering and Biotechnology, New Museums Site, Pembroke St, Cambridge, CB2 3RA, UK*

²*Department of Chemical Engineering, Polytechnic School, University of São Paulo, Av. Prof. Luciano Gualberto, 380, trav. 3, 05508-010, São Paulo, SP, Brazil*

³*IHS Downstream Research, 133 Houndsditch, London EC3A 7BX, UK*

⁴*Institute for Chemical and Thermal Process Engineering, Technische Universität Braunschweig, Langer Kamp 7, 38106 Braunschweig, Germany*

ABSTRACT

Coatings for reducing the rate of fouling on heat transfer surfaces are often promoted as a viable mitigation option in the food sector. The financial attractiveness of such coatings for retrofit applications is considered, where an uncoated exchanger is replaced by a coated one. The replacement unit may be larger owing to the extra thermal resistance introduced by the coating. The annualised operating costs are calculated, based on optimised, regular fouling and cleaning cycles as well as the annualised cost of the replacement unit. Fouling rates based on literature values are used. The attractiveness of the coating is very sensitive to the reduction in fouling rate if this can be achieved over the lifetime of the unit. The marginal benefit, which must include the additional cost of the coating, can then be estimated.