

Fouling Mitigation Using Helical Baffle Heat Exchangers and Comparative Analysis Using HTRI Xchanger Suite® Educational Software

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Abstract : Heat exchangers are devices used to transfer heat from one fluid to another via convection and conduction. The need for effective heat transfer has made their presence vital in hundreds of industries including petroleum refineries, petrochemical plants, fertiliser plants and pharmaceutical companies. Fouling has been one of the major problems hindering efficient transfer of thermal energy in heat exchangers. Several design changes have been coined for fighting fouling. A recent development involves using helical baffles in place of conventional segmented baffles in shell and tube heat exchangers. The aim of this paper is to understand the advantages of helical baffle exchangers, how they aid in fouling mitigation and its corresponding limitations. A comparative analysis was conducted between a helical baffle heat exchanger and a conventional segmented baffle heat exchanger using HTRI Xchanger Suite® Educational software and conclusions were drawn to study how the heat transfer process differs in the two cases.

Keywords : heat transfer, heat exchangers, fouling mitigation, helical baffles

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