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THERMO-HYDRAULIC SIMULATION OF PLATE FIN HEAT EXCHANGERS USING OPTISIM®

Alexander Woitalka*,§, Ingo Thomas*, Pascal Freko*, Amin Solouki**
*Linde AG - Engineering Division, Dr.-Carl-von-Linde-Str. 6-14, 82049 Pullach, Germany
**Politecnico di Milano, School of Industrial and Information Engineering,
Piazza Leonardo da Vinci 32, 20133 Milano, Italy
§Correspondence author. alexander.woitalka@linde.com

ABSTRACT Our methods for transient and steady state simulation of Plate Fin Heat Exchangers (PFHEs) have been enhanced with regard to accuracy as well as robustness. The model relies on Linde's in-house process simulator OPTISIM® as well as Linde's physical property system GMPS. A new method for a precise calculation of the heat transfer coefficient (htc) for multi-component single- and multiphase flows methods based on the Chilton-Colburn J-factor analogy has been implemented. The htc is evaluated in each node based on local stream conditions, phase and physical properties. Convergence problems have been observed and the reason has been identified to be kinks in the spatial property profiles caused by dew points, boiling points, or step changes of the htc due to fin changes. These problems can be solved using a spatial regularization of the respective profiles in an intermediate step of the computation. Additionally, the computational speed of the model, especially for streams with a high number of components, was increased significantly by introducing a reviewed software infrastructure.