FLOW MALDISTRIBUTION IN HEAT EXCHANGERS: A REVIEW OF THE DIFFERENT TYPES

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ABSTRACT

The many kinds of inequalities and their causes are explored. Wherever feasible, methods for preventing or resolving the issue are provided. While the performance reduction is usually minor, the accompanying mechanical issues may be quite serious. The prefix mal denotes anything that is faulty or bad, thus the meaning of the word maldistribution is determined on how distribution is defined. How is uniform defined in the context of a comparison to a uniform distribution? A uniform distribution of a tube-side flow through a bundle of tubes may imply an equal quantity of fluid in each tube or that each fluid particle has an equal residence time in each tube (this would be "plug" flow). The fluid may, however, flow at the same rate (as is often assumed) or at various speeds. Because the local velocities change as the fluid travels through the bundle, defining uniform or continuous flow throughout a bundle of tubes becomes more difficult depending on where the reference flow region is situated. Other variables that influence the "distribution" of flow inside the bundle include bypassing and leakages in shell-and-tube exchangers.

KEYWORDS: *Fluid Flow, Heat Exchangers, Heat Transfer, Maldistribution, Uniform Distribution.*

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