

Gasket groove analysis on a heat exchanger

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Alfa Laval introduced its first commercial heat exchanger in 1938. Ever since, the heat exchanger has been a vital component in the food, energy, environment and marine industries. The design of the plates in a plate heat exchanger is today very optimized and small changes on the design can have significant impacts on the performance of the heat exchanger. A better performing heat exchanger can cut costs, reduce the environmental impact and optimize energy consumption for customers.

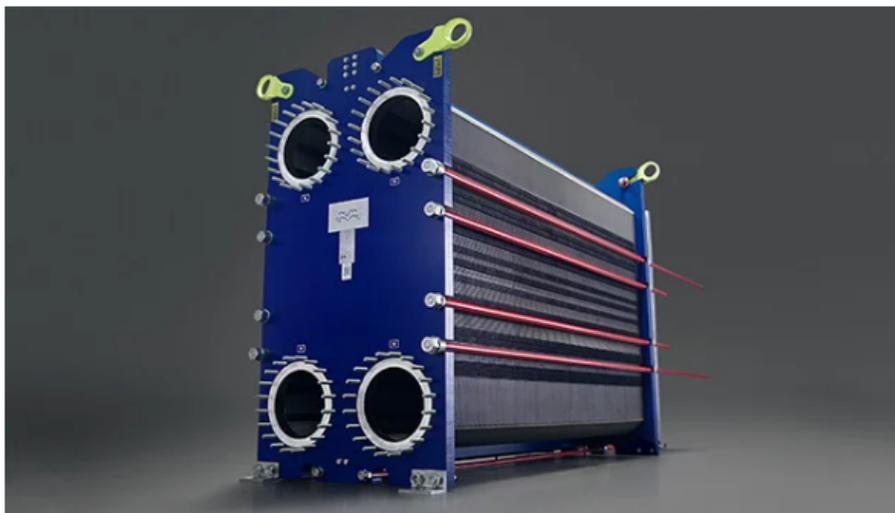


Figure 1: The gasketed plate heat exchanger [1]

When developing gasketed plate heat exchangers, mechanical performance of the product has previously mainly been considered to depend on the channel plate design. This thesis however, has found, that the relationship between the gasket and the gasket groove design may have large impacts on the performance. The incompressible nature of the rubber compounds used in the gaskets is an important factor to consider when designing channel plates.

In the past, data related to the gasket and gasket groove on a plate heat exchanger has been insufficient. This has led to the plate designers finding difficulties in making changes to the existing designs. The goal is to provide a better understanding of parameters related to these components

on a commercial heat exchanger. By doing so, designers may have a solid theoretical basis when designing new plates. The work can hopefully give valuable insights that previously have not been considered.

The results from this work is primarily targeting plate designers at Alfa Laval. The thesis may be used as a guideline when designing gaskets and gasket grooves for plate heat exchangers. The work also addresses some possible flaws with the current methods that are used and provides suggestions for future improvement. This work should however be used with care, since it lacks physical validation and only analyzes specific conditions for a small section of one single plate design.

References

- [1] Alfa Laval. Gasketed plate-and-frame heat exchangers. URL: <https://www.alfalaval.com/products/heat-transfer/plate-heat-exchangers/gasketed-plate-and-frame-heat-exchangers/> (visited on 04/27/2022).