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Alfa Laval double-wall plate heat exchangers

The perfect choice to prevent fluids from intermixing

Alfa Laval double-wall plate heat exchangers combine the high-efficiency heat transfer benefits of conventional plate heat exchangers with a design that eliminates any risk of the fluids intermixing as they pass through the heat exchanger.

The double-wall design means that any leakage of either of the two fluids passing through the heat exchanger shows up on the outside of the heat exchanger, which can thus be taken out of operation for service.

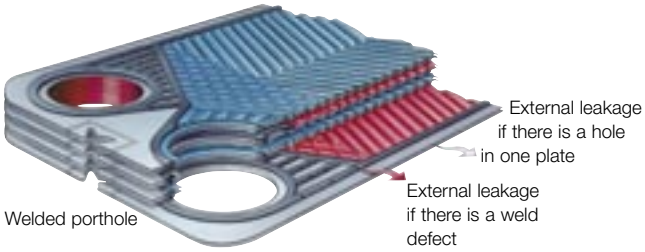
Alfa Laval double-wall plate heat exchangers are therefore ideal for use with fluids that must not be allowed to mix because of the environmental effects, deterioration of process fluids or because it would be hazardous. In steel mills, such situations include preventing cooling water being polluted by lubricating oils, hydraulic oils and cooling emulsions, as well as preventing water from contaminating these liquids. In electric arc furnaces, double-wall plate heat exchangers can be used to prevent water from getting mixed into the transformer oil cooling circuit, thus eliminating the risk of explosion.

New design provides extra safety

Alfa Laval double-wall plate heat exchangers work on the same principle as conventional plate heat exchangers. However, the single plates between the two media are replaced by pairs of identical plates that are laser-welded together around the portholes. The channels formed when the welded plate pairs are assembled in a plate pack are sealed by gaskets in the conventional manner.

In the unlikely event of leakage occurring, traces of one of the two media will then always appear on the outside of the plate heat exchanger. Should a failure occur in the plate, gasket or seal weld, the ensuing leak will be clearly visible. This means that

- any puncture in one of the double plates will result in external leakage from between a specific pair of plates, making detection easy.
- a gasket defect will cause an external leak, either directly from the peripheral gasket or from the gasket vents open to the air.
- a weld defect will cause an external leak from either the gasket vents or between the plates at the site of the failure.



No intermixing of media if leakage occurs – any leakage is external.

Advantages of double-wall plate heat exchangers

In addition to the major advantage of preventing intermixing of the two media used, double-wall plate heat exchangers are also superior to any comparable solutions, including double-wall shell-and-tube heat exchangers.

Double-wall plate heat exchangers achieve heat transfer coefficients that are normally two to three times higher than in shell-and-tube heat exchangers. This means that the heat transfer area required is significantly smaller, which in turn makes a crucial difference in terms of initial investment, especially when stainless steel or more exotic materials are needed. In addition, the low weight and compact design mean that installation costs are much lower.

The design, featuring individual pairs of plates in a separate frame, makes this a highly versatile solution that can be optimized to fit a wide range of different capacities. Furthermore, full access to the heat transfer area makes maintenance easy and reduces the number of man-hours required.

Proven experience in Germany

Since 1998, Alfa Laval has installed more than 50 double-wall plate heat exchangers in Germany, which is noted for its strict environmental regulations. These installations safeguard steel manufacturers that use hydraulic oil cooling against oil contaminating their cooling water or vice versa. More than half of these double-wall heat exchangers are installed at the ThyssenKrupp Steel Number1 rolling mill (KW1) in Bruckhausen.

Two M30-DWFG double-wall plate heat exchangers for emulsion cooling of tandem lines.

Ulrich Hingmann, works manager at ThyssenKrupp Steel, outlines the advantages of the new installation. “We replaced all tubular heat exchangers in the oil hydraulic systems with double-wall plate heat exchangers,” he says. “It is no longer necessary to shut down or open the DW-PHW system for troubleshooting oil leakage. This means that we save a lot of time and we can also be sure of everything working perfectly!”

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