



Hot acids no problem for tantalum heat exchanger

United Initiators, Pullach, Germany

Case story

The long lifetime, minimum maintenance and low installation cost offered by Alfa Laval tantalum heat exchangers made it easy for United Initiators to choose a preheater for its new sulphuric acid recovery process.

When specialty chemicals manufacturer United Initiators in Pullach, Germany revamped its sulphuric acid recovery process it required a heat exchanger that could withstand hot, strong acids.

Several options

Project engineer Clemens Tratter and his colleagues first considered using a silicon carbide heat exchanger but were put off by the high cost, fragility and bulky size.

A graphite heat exchanger wasn't a good option either. The hot, strong sulphuric acid would eventually dissolve the resin in the graphite, with frequent maintenance and downtime as a result.

One clear winner

When the engineers at United Initiators came in contact with Alfa Laval tantalum heat exchangers they saw that Alfa Laval's solution had many advantages over competing technologies. And that it would fit the tight budget.

They made the decision quickly and installed an Alfa Laval tantalum heat exchanger just two months after United Initiators first heard about the product.

A revolutionary innovation

The Alfa Laval tantalum heat exchanger is a stainless steel heat exchanger that has undergone a unique chemical



vapour deposition treatment where a thin tantalum layer is metallurgically bonded to the steel core.

The result is a heat exchanger featuring the same extreme corrosion resistance as a solid-tantalum heat exchanger but with a significantly lower investment cost.

The steel core of an Alfa Laval heat exchanger makes it mechanically strong and gives it much greater resistance to thermal shock than glass, silicon carbide and graphite heat exchangers.

Compact size

Alfa Laval tantalum heat exchangers use plate technology, resulting in high efficiency and compact size.

"The people receiving the heat exchanger at the plant had a hard time believing the small box contained a heat exchanger", says Clemens Tratter.

The optimized geometry, highly turbulent flow, good conductivity of the material and high mechanical stability all add up to a heat exchanger with very high thermal efficiency and surprisingly small size.

No maintenance required

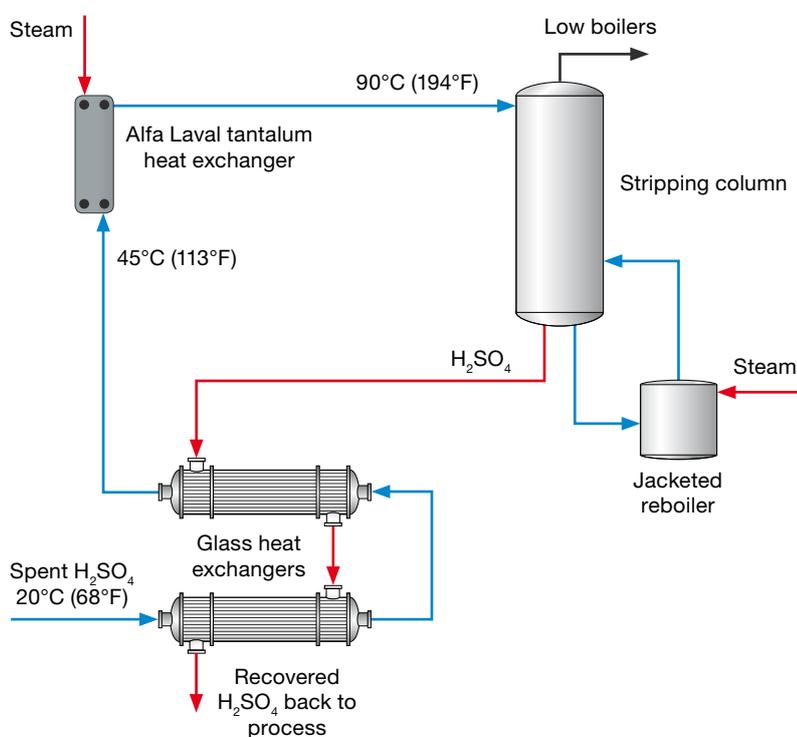
The engineers at United Initiators had some initial doubts whether the thin tantalum layer could withstand the hot acid. After a few months of operation the Alfa Laval heat exchanger was taken out of operation and inspected with an endoscope. The heat exchanger was found to be in perfect condition, unaffected by the highly corrosive medium.



“The process runs continuously and there is no need for any cleaning or service of the heat exchanger”, says Clemens Tratter, Project Engineer at United Initiators.



Alfa Laval tantalum heat exchanger installed at United Initiators.



The process

United Initiators uses strong sulphuric acid in the production of organic peroxides. For the last ten years the spent sulphuric acid has been recovered and purified so that it can be reused in the production process.

Purification takes place in a stripper where the low boilers exit at the top of the column and purified sulphuric acid exits at the bottom. Previously, the stripper was heated with direct steam injection, causing dilution of the sulphuric acid.

The revamped system uses a jacketed reboiler, two interchangers and a preheater to heat the sulphuric acid, eliminating the need for direct steam injection.

The new system has a substantially higher recovery efficiency which leads to lower operating costs. The Alfa Laval tantalum heat exchanger is the last of the three preheaters and raises the temperature of the acid from 45°C (113°F) to 90°C (194°F).

Fast facts

About the company

United Initiators is a leading producer of high-grade organic peroxides and persulfates, with production facilities in Germany, USA, Australia and China.

The company's products have a wide range of uses, including the production of polymers, cosmetics, pulp & paper, disinfectants, coatings and electronics.

Alfa Laval tantalum heat exchanger – highly corrosion resistant, high-performance plate heat exchanger

- Excellent for handling hot, highly corrosive media
- Minimal maintenance
- Very low lifecycle cost
- High thermal efficiency
- Low investment cost



How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com.