DuroShell secures uptime in coal tar oil depot

Rütgers Germany GmbH, Castrop-Rauxel, Germany **Case story**

High resistance to material fatigue, outstanding thermal efficiency, minimal fouling and a well-developed service network were the major reasons for Rütgers to install two Alfa Laval DuroShell plate-and-shell heat exchangers in its coal tar oil depot in Castrop-Rauxel, Germany. "The DuroShell heat exchangers fulfilled our expectations entirely, right from day one," says Dietmar Scholl, operations technical officer at the Rütgers Group.

Demanding duty

Rütgers is one of the world's leading producers of high-quality coal tar oil. When expanding its Castrop-Rauxel depot with new storage capacity the company needed to invest in a cooling solution for the new tanks.

The tanks are filled with batches of oil, which are cooled from 135°C (275°F) to 75°C (167°F) before shipping. The temperature and pressure in the heat exchangers varies over time, causing material fatigue and increasing the risk for unplanned downtime.

The duty is also characterized by fouling, and it is important to choose a heat exchanger with good resistance to fouling for this position to minimize time and cost for cleaning.

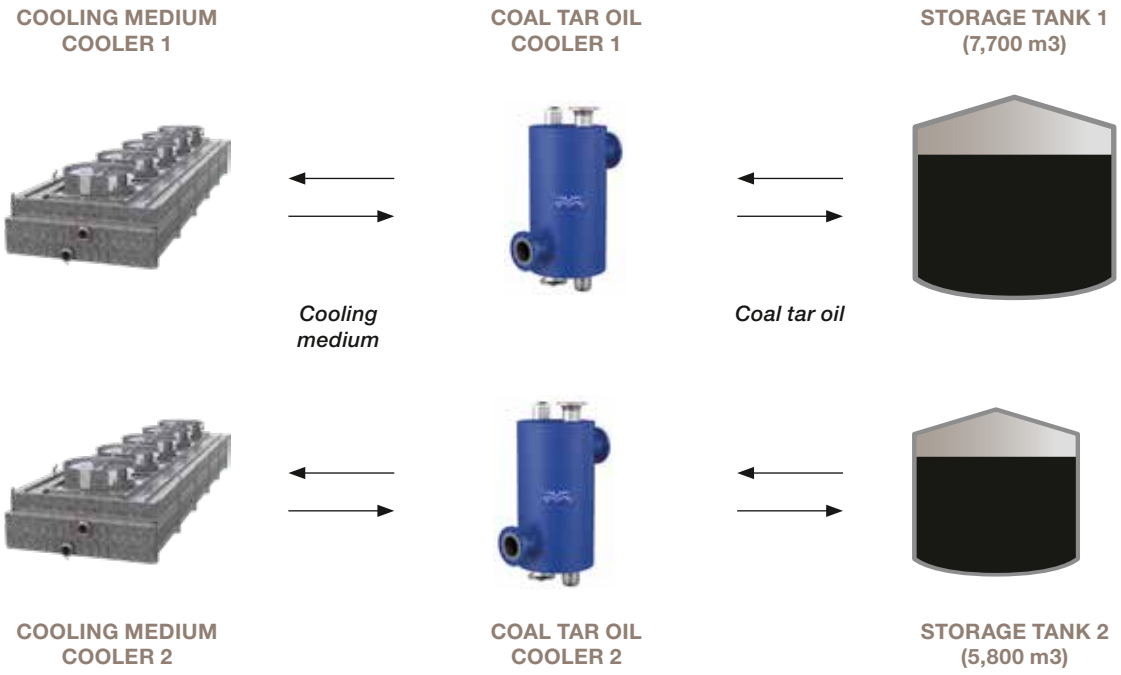
A complete cooling solution

Alfa Laval offered Rütgers a complete cooling solution where the coal tar oil is cooled by two Alfa Laval DuroShell plate-and-shell heat exchangers. The cooling medium from the DuroShells is in turn cooled by two Alfa Laval ACHE air-cooled heat exchangers.

DuroShell – built for tough conditions

Alfa Laval DuroShell is specifically designed for duties where metal fatigue is a problem and was a perfect choice for Rütgers. Thanks to its unique plate pattern, inlet and outlet pipes that traverse the entire plate pack, and laser-welded plates, DuroShell offers much better fatigue resistance than shell-and-tube and conventional plate-and-shell heat exchangers.

The high thermal efficiency means the DuroShells are very compact and easy to install (see the image above). The required space is much smaller than for a comparable shell-and-tube heat exchanger.



The ability to operate with crossing temperatures and the small temperature approach make DuroShell highly efficient in cooling duties. For Rütgers this means the cooling medium can be better utilized, with lower costs for piping and pumps as a result, as well as lower costs for pumping the cooling medium.

The highly turbulent flow in a DuroShell effectively reduces fouling and minimizes maintenance.

“Apart from the excellent cooling capacity, we were really impressed by the minimal maintenance needed. The special plate pattern prevents fouling and all we need do to clean the DuroShell is to flush it through,” says Dietmar Scholl.

ACHE – effective air coolers

The cooling medium used in the two DuroShells is cooled in two Alfa Laval ACHE air-cooled heat exchangers. The units are certified for use in explosive environments and complement the DuroShells perfectly.

Two Alfa Laval ACHEs (Air-Cooled Heat Exchanger) provide effective cooling of the cooling medium.

Fast facts

The customer
The Rütgers Group is one of the world’s leading producers of chemical raw materials derived from coal tar. The company was founded in 1869 and has eight production sites worldwide.

The challenge
To cool batches of coal tar oil. The operating conditions cause metal fatigue and fouling in most types of heat exchangers.

The solution
Two Alfa Laval DuroShells were installed as coal tar oil coolers and two Alfa Laval ACHE air-cooled heat exchangers handle the cooling of the cooling medium.

The benefits

- More uptime due to high resistance to fatigue
- Low maintenance requirements
- Compact, lightweight installation

DuroShell RollerCoaster
Robust and efficient performance.

DuroShell PowerPack
Optimized flow distribution and fatigue resistance.

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