



Customer achieves payback in under two-and-a-half months with compact heat exchanger

Georgia, USA

In an ongoing effort to improve plant efficiency and reduce operating costs, a pulp mill in Georgia decided to use a compact heat exchanger to preheat its chlorine dioxide solution with waste heat from its bleach plant (E_{op} Filtrate). This application is often very demanding in terms of thermal efficiency and also requires titanium as the material of construction. Therefore, a tubular type heat exchanger is often not an economical or even a practical choice, due to its inherently low thermal efficiency.

The ideal heat exchanger for this particular application would combine the high efficiency and high shear found in corrugated plate-and-frame technology with the reliability and convenience of a welded, gasket-free, design. In addition, this heat exchanger must have the adequate channel spacing to handle the small concentration of fibers present in the Filtrate stream.

After a careful evaluation of available technologies, this pulp mill chose an Alfa Laval Compabloc[®] welded heat exchanger. The unit was installed and started in December 2004 and continues to perform as originally designed, with no drop-off in performance. In fact, this unit has not yet required maintenance of any kind. If designed and operated correctly, with good channel velocities, it is common for the Compabloc to run continuously for several years.

By utilizing the waste heat from the Filtrate stream to preheat the chlorine dioxide solution, this mill is realizing a steam savings of more than \$592,000 per year, according to the pulp mill's process engineer. Based on a total installed cost of \$120,000 for the entire project (heat exchanger, piping, valves, instrumentation, labor, etc.), the payback on this project was under two-and-a-half months! The steam cost for this particular mill is \$3.64 per 1,000 lb. of steam.



The Compabloc provides a cost-effective, efficient and reliable way for pulp mills to heat the chlorine dioxide solution.

The Compabloc is a compact, high-efficiency welded heat exchanger designed to handle aggressive or hazardous fluids. The medium-gap channels also permit a small amount of fibers to pass through the exchanger. Compabloc consists of a series of corrugated plates that are laser welded together to form a plate pack. The corrugated pattern enhances fluid turbulence within the channels to maximize heat transfer and minimize fouling tendencies. The absence of any inter-plate gaskets eliminates compatibility concerns, and thus reduces maintenance and operating costs.

What separates the Compabloc from other all-welded heat exchangers is the ability to mechanically access and clean both hot and cold sides of the unit. Of course, a chemical clean-in-place (CIP) system is always preferred, since it is typically much less difficult and time consuming than mechanical cleaning. However, if CIP is not available or proves to be ineffective, then one can simply remove the covers (two for the process side and two for the utility side) to visually inspect and mechanically wash the channels. As shown in **Figure 1**, the fluid travels a very short distance as it flows from one side of the plate pack to the opposite side (from cover to cover of the Compabloc).

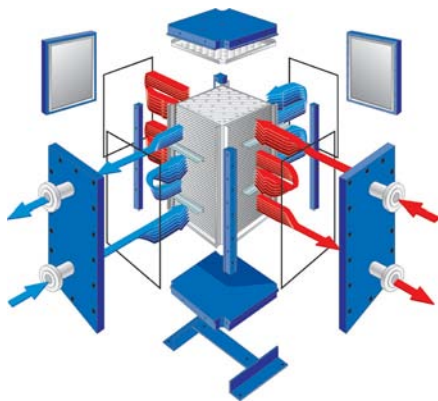


Figure 1. The fluid travels a very short distance as it flows from one side of the plate pack to the opposite side (from cover to cover of the Compabloc).

This short plate distance helps make cleaning the Compabloc very quick and simple, as compared to other types of heat exchangers with longer channel lengths. **Figure 2** shows an operator effectively cleaning the Compabloc.

With more than 8,500 Compabloc units installed worldwide in various applications, more and more customers are realizing the benefits of this highly efficient and compact technology. While there are many types of heat exchangers in the market, each with its own set of advantages, very few can match the combination of efficiency, convenience, reliability and economy found in Alfa Laval's Compabloc.



Figure 2. An operator effectively cleans the Compabloc.

Preheating ClO_2 with Bleach Plant Filtrate

