



## How a small heat exchanger made a believer of a Brazilian giant

Braskem gets more than they bargained for from Compabloc

Case story

The world plastics industry has been growing by leaps and bounds – 3-5 % annually – for years. Braskem, Brazil's biggest petrochemical manufacturer, produces among other chemicals ethylene, a critical component in plastic production. So it's no surprise that the company has been increasing production capacity on a regular basis. Or that space was becoming a critical issue for them.

Alfa Laval's Compabloc was clearly an excellent solution to the space problem when Braskem planned to revamp their ethylene plant in Camaçari, Brazil in 2002. But, Alfa Laval's small wonder, delivered a "surprisingly" impressive list of other benefits as well.

### Plenty of reasons to be happy with Compabloc

"Braskem was a little skeptical about the Compablocs, at first," explains Alfa Laval Sales Engineer Marcos Matsufuji, "Any downtime is hugely expensive for them. And though Compabloc was already a proven product, it was still an unknown quantity to Braskem. That made them nervous. But since there just wasn't room to install shell-and-tubes, they went with two Compablocs instead. Since then, they've had plenty of reasons to be happy they did."

### Installation was a breeze

The two Compablocs were installed as quench water coolers in the Braskem plant's quench water tower. Braskem olefins unit process engineering is quick to point out that besides taking up only a fraction of the space, "they were less complicated – and faster – to install than shell-and-tube heat exchangers."



Continuous growth in the plastics industry has caused petrochemical manufacturers in Brazil to expand their plants.

In addition, the same compact design that was the deciding factor in Braskem's revamp project is also an advantage in new plants because they are smaller and lighter and require less concrete and less steel construction.

### They haven't had to clean them yet

The Compablocs are perfect for the position they are in at the Braskem plant since the risk of fouling is high. And they have no gaskets, so there is no risk of leakage despite the presence of aggres-

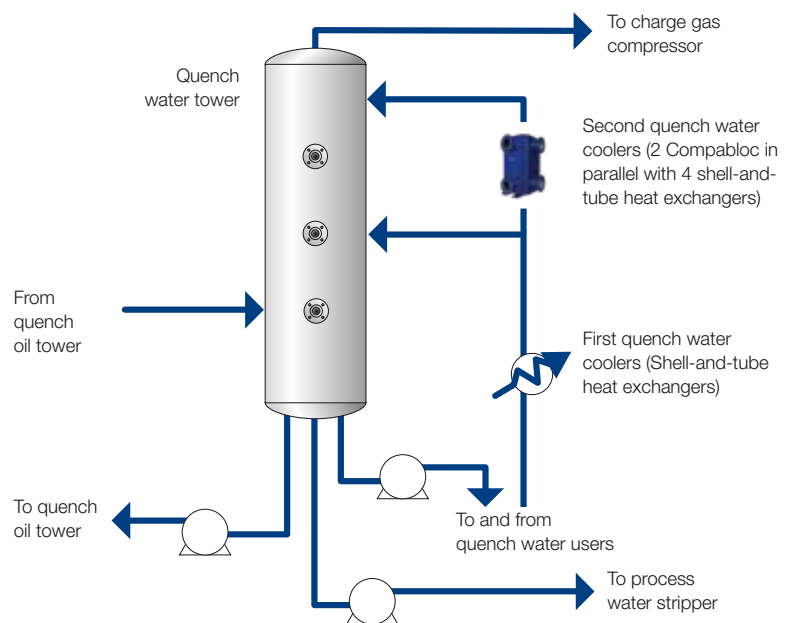
sive hydrocarbons and the like. The units are also extremely easy to maintain. They can be cleaned by simply removing their outer panels – that is, if they have to be cleaned at all. At Braskem, the Compablocs have been in service for approximately five years, and have not needed cleaning yet. In contrast, the four shell-and-tube heat exchangers running parallel to the Compablocs have to be cleaned approximately every second year.

## The process

The feed to the ethylene plant is 99.5% Naptha and 0.5% Ethane. The pyrolysis gas produced in the furnace is led to an oil quench tower where heavy hydrocarbons are removed. Then the process gas (at 115°C) is sent to the quench water tower.

Two Alfa Laval compact heat exchangers are in operation as quench water coolers in the quench water tower. They operate in parallel with 4 shell-and-tube heat exchangers.

The quench water leaving the tower is warm (83°C). This energy is used in other parts of the plant. The water is then returned to the quench water coolers and cooled down to 35°C, before it is used in the quench water tower once again.



The two space- and maintenance-saving Compablocs at the Braskem plant

### Corrosion? Not a problem

Braskem has had problems with corrosion with their shell-and-tube heat exchangers. Not so with the Compablocs. They are made of stainless steel, not carbon steel. So corrosion is simply not an issue.

### Only positive things to say

Despite their initial uncertainty, Braskem is thoroughly satisfied with their decision to install the Compablocs. Marcos Matsufugi elaborates:

“The people at Braskem have nothing but good things to say about the Compablocs. They’ve found them to be very robust and they’ve saved

significant amounts of time – and money – on maintenance work. If it weren’t for the small size, I’m not sure Braskem would even have looked at Compabloc initially. But today, they know that Compabloc is more than just small and light: It’s an efficient and reliable solution. And it’s no compromise.”

### Fast Facts:

#### The customer

Braskem is:

- A world-class Brazilian petrochemical company producing mainly polyethylene, polypropylene and PVC for the Brazilian market
- Listed on the Wall Street and Sao Paolo stock exchanges
- Chiefly owned by the Odebrecht construction company

#### The challenge

In 2002, Braskem:

- Set out to Revamp their ethylene plant in Camaçari, Brazil and thus needed additional heat exchangers for their quench water tower
- Needed a smaller solution than the shell-and-tube heat exchangers they were accustomed to using
- Wanted to improve efficiency

#### The Benefits

- Small enough and light enough to suit process line specifications
- High resistance to fouling (particularly as compared to shell and tubes)
- No corrosion
- Long maintenance intervals save downtime and money
- Easy access for maintenance when required

### Key Facts:



**Design temperature**  
400°C (752°F), down to  
-100 °C (-148°F)

**Design pressure**  
From full vacuum to  
42 barg (600 psig)

#### Maximum heat transfer area

840 m<sup>2</sup> (8,985 ft<sup>2</sup>)

#### Material of construction

316L, SMO254, 904L (UB6),  
Titanium, C-276/C-22/C-2000

#### Duties

Heat recovery, cooling, heating,  
condensation, partial condensation,  
reboiling, evaporation and gas cooling.

Learn more at [www.alfalaval.com/compabloc](http://www.alfalaval.com/compabloc)

### Unique features

Compabloc is the champion of heat exchange thanks to unique Alfa Laval innovations that enable reliable, efficient performance, letting you save energy and improve sustainability.



#### SmartClean

Fast and efficient flushing of  
fouling material



#### C-Weld

Superior cleaning and  
extended performance



#### XCore

Advanced design for higher  
pressures



#### ALOnsite

Qualified support at your  
facility

### 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](http://www.alfalaval.com).