



## M30 heat exchanger boosts evaporation capacity at Australian sugar mill

Mulgrave Central Mill, Queensland, Australia

Case Story



In 1992 Mulgrave Central Mill installed an Alfa Laval M30 plate heat exchanger (PHE) as a clarified juice heater to increase evaporator station capacity. According to Production Manager Glenn Pope, the PHE has met all expectations in terms of heat transfer performance and trouble-free operation.

“Preheating of the clarified juice has increased the capacity of the evaporators by 2.5 to 5%,” relates Glenn Pope. “The only maintenance done to the PHE is to clean it with a caustic solution about four times per crushing season. Clarified juice

heating is the perfect position for plate heat exchangers.”

### Output increased, season extended

In 1992 Mulgrave Central Mill took over processing cane from a neighbouring mill area. This necessitated going from five-day per week operation to continuous operation, an increase in crushing rate, and an extended season length.

With this change, it was considered advantageous to increase evaporator station capacity. After considering the options available, Mulgrave decided to install a clarified juice heater. This would

### Fast Facts

#### Mulgrave Central Mill

Mulgrave Central Mill is located in Gordonvale in the tropical state of north Queensland, Australia. Established in 1896, the plant produces raw sugar as a grower co-operative, receiving cane from around 300 farms and approx. 200 suppliers. The mill has a cane crushing capacity of 11,000 tons of cane per day. Each year during the crush season (lasting 22-24 weeks) cane is gathered from a 17,000 hectare area. This cane (about 1.3 million tonnes) is crushed 24 hours a day, 7 days a week by the mill at a rate of 450 tonnes per hour. The plant produces about 160,000 tonnes of sugar annually. Mulgrave Mill generates all of the power required by the crush in addition to exporting electricity to the State grid.



At Mulgrave Central Mill in Australia, an Alfa Laval M30 plate heat exchanger, installed as a clarified juice heater, has increased evaporator station capacity by 2.5 to 5%.

heat the juice prior to entry to the first effect of the evaporator set, increasing the heat available in that vessel for evaporation. The proposal was seen to offer a relatively low-cost option to boost evaporator capacity.

#### M30 PHE installed

An Alfa Laval M30 plate heat exchanger was installed as a clarified juice heater. The clarified juice is heated from 95°C to 105°C. The heat source is either bleed-off vapour from the first evaporator effect or low pressure steam



According to Production Manager Glenn Pope, the M30 PHE has lived up to all expectations. "Clarified juice heating is the perfect position for plate heat exchangers."

at 120°C. The juice can flow through the heater in either direction.

The decision to purchase an Alfa Laval plate heat exchanger was based on claims of high heat transfer efficiency with low temperature differential between heating medium and juice.

#### Success story

According to Glenn Pope, the PHE has lived up to all expectations in terms of heat transfer performance and trouble-free operation. "The clarified juice heater has been a success story for us."

Before the clarified juice heater was installed, the juice was subcooled at 95°C when entering the first effect. Glenn Pope estimates that preheating of the clarified juice has increased the capacity of the evaporators by 2.5 to 5%.

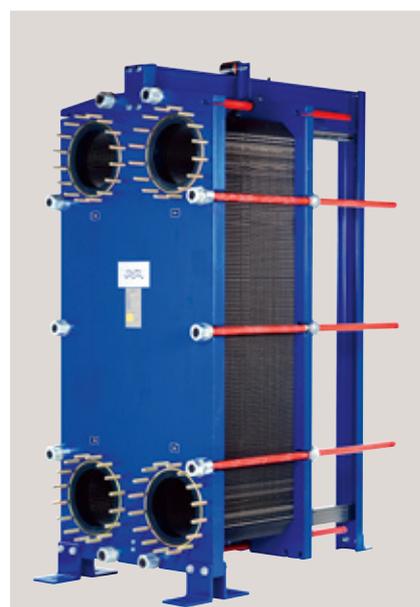
#### Original gaskets still fitted!

The ability to reverse the flow direction has allowed the M30 PHE to handle short periods of quite high particulate loads. Yet the only maintenance performed on the unit is to clean it with a caustic solution, using CIP (Cleaning-in-Place), about four times per crushing season.

The PHE has had an extraordinary long period of operation without gasket replacement. Installed in 1992, it has successfully completed 17 crushing seasons. There has not been any reason to take the plate pack apart, and the gaskets are still the original ones.

#### Years of service ahead

It is anticipated that the unit will go into the 2010 crushing season without overhaul. Replacement of the gaskets must, of course, be done sooner or later, but Glenn Pope says: "We see no reason to believe that the unit will not continue to provide service for many years to come."



#### Gasketed Plate Heat Exchangers (PHEs)

The conventional type of Alfa Laval PHEs use heat transfer plates fitted with gaskets that seal off each channel from the next, and direct the fluids into alternate channels. They are used throughout industry as standard equipment for efficient heating, cooling, heat recovery, condensation and evaporation.

#### Alfa Laval PHEs offer:

- High thermal efficiency for effective heat transfer.
- Compact design, resulting in small quantities of materials used for heat transfer surfaces.
- Low installation cost.
- Easy dismantling and easy, rapid cleaning.
- High performance with low hold-up volume.
- Versatile, modular design.

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Alfa Laval reserves the right to change specifications without prior notification.

#### How to contact Alfa Laval

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