Pioneer turns alcohol vapour energy into savings of 63 MINR per annum with Alfa Laval evaporation systems

Pioneer Industries Limited, Pathankot Punjab, India **Case story**

"We're running two distillery-integrated multi-effect evaporators on distillery spent wash and getting more than 21 tonnes per hour water evaporation – without any fuel or steam consumption, which reduces effluent volume up to 40-50%," says Mr S. S. Tomar, Chief Executive Officer, Pioneer Industries.

Cost-effective 4-effect distillery-integrated evaporation system at Pioneer Industries Limited in India.

Satisfied customer comes back for more – and more

Pioneer Industries Limited, a leading Indian supplier of potable alcohol and starch derivatives, purchased a multi-effect evaporation system for starch derivatives from Alfa Laval in the early 1990s. According to Mr Tomar, that system is still in operation and his company has been satisfactorily doing business with Alfa Laval for 20 years.

So it comes as no surprise that in 2011, Pioneer turned to Alfa Laval to design a cost-effective distillery-integrated evaporator system. Alcohol vapours were used as the energy source for concentrating distillery spent wash in the new evaporator system. Once the new system was up and running "perfectly", Pioneer purchased yet another Alfa Laval evaporation system in 2013.

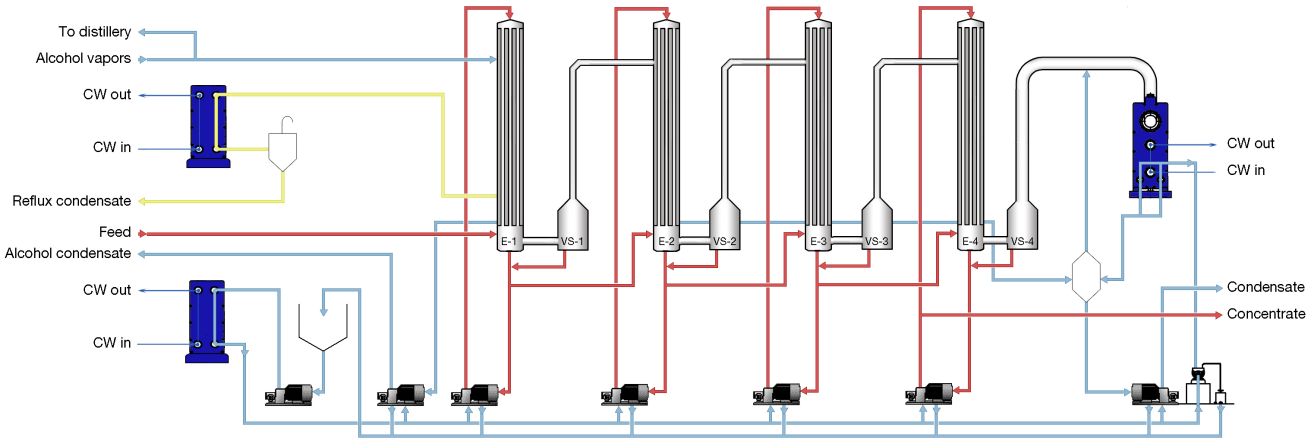
63 MINR in fuel savings alone

The first of the two newer systems is a 2-effect system consisting of falling film shell-and-tube evaporators with a water-evaporation capacity of 12.8 tonnes per hour. The second is a 4-effect falling-film system with a capacity of 8.6 tonnes per hour. Both evaporation systems are fully integrated with the distillery. As the existing distillery was already operational, carrying out the installation and final interconnection of the evaporator system with the distillery during a short shutdown was critical in deference to safety considerations.

In the two evaporator systems, alcohol vapours from Pioneer Industries' distillation columns replace steam as the heating media with approximately 50% evaporation achieved. Attaining the same results using steam as the heating medium would require 6.5 and 2.3 tonnes of steam per hour respectively at an annual cost of approximately 63 MINR (EUR 800,000).

Alcohol quality retained and cooling-water costs eliminated

The alcohol vapours were otherwise simply condensed in condensers, which required additional energy for cooling water circulation. A critical success factor was the ability of the evaporator



Flowchart of the 4-effect evaporation system.

"Pioneer management is very happy with the commitment level, technical competency and dedication of the Alfa Laval team," says Mr S. S. Tomar, CEO of Pioneer Industries.

systems to condense alcohol vapours and simultaneously separate the impurities in the alcohol vapour within the system. In distilleries, such impurities are normally condensed separately in a vent condenser.

Less cleaning = low downtime and low cleaning costs

Both Alfa Laval evaporator systems feature low-temperature design allowing operation at less than 75° C and appropriate wetting (recirculation). The low temperature operation and proper wetting results in minimal scaling leading to minimal cleaning-in-place (CIP), which in turn results in low downtime. CIP frequency in Alfa Laval systems is less than half as compared to evaporator systems supplied by others.

Low downtime is particularly important and beneficial for Pioneer Industries because the effluent handled by the evaporator systems is produced constantly during the distillation process. In addition, minimal CIP generates savings in cleaning solution, effluent treatment and water.

An enthusiastic recommendation

Pioneer industries' long-term relationship with Alfa Laval and its repeat business with Alfa Laval show the company's strong endorsement. Pioneer Industries CEO S. S. Tomar also has this to say:

"Pioneer management is very much happy with the commitment level, technical competency and dedication of the Alfa Laval team, and we don't hesitate to recommend Alfa Laval to other customers."

Fast facts

The customer

Located in the state of Punjab, India, Pioneer Industries Limited is a leading supplier of potable alcohol and starch derivatives.

The challenge

To design, supply and install two evaporator systems for concentrating spent wash from grain-based distillery using alcohol vapour from the distillation columns as the only heating medium/fuel.

The solution

Two evaporation systems, one 2-effect and the other 4-effect, consisting entirely of falling-film shell-and-tube heat exchangers.

The benefits

- Savings of 63 MINR 63 (EUR 800,000) in steam/energy costs
- Savings on cooling-water circulation costs
- Low cleaning frequency
- Savings on cleaning solution, cleaning solution treatment and water
- Less downtime

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.