Sweet talk and hard facts

A sweet deal for the sugar industry

www.alfalaval.com/sugar

You don't need to waste energy

www.alfalaval.com/sugar

It's more than just sweet talk

Energy means a lot to your business – it's a pity to waste it.

For years, Alfa Laval has been leading the way in efficient heat transfer. The recovery and re-use of costly energy, whether purchased or generated during process operations, can have an enormous impact on your results. And the focus on saving energy will increase even more in the years to come.

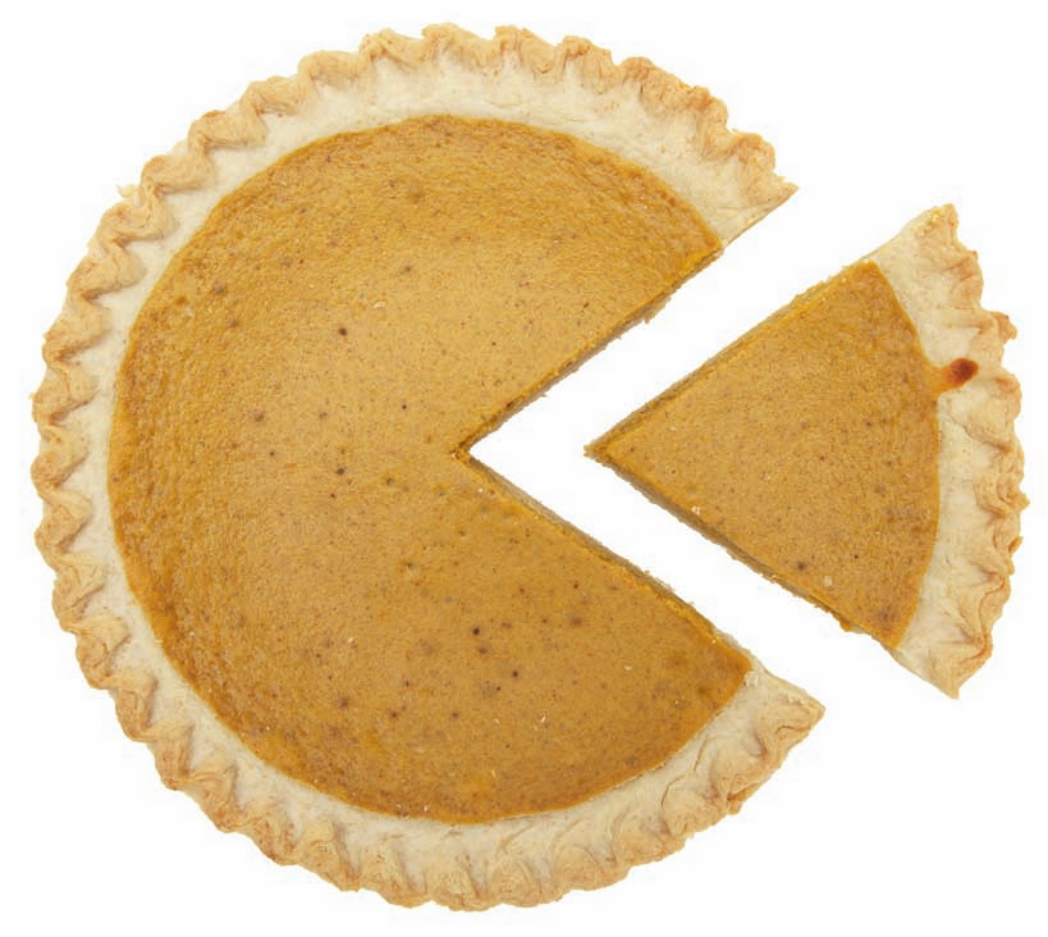
That's why the sugar industry is gradually converting to plate heat exchangers. The investment can bring huge benefits in terms of increased heat recovery.

When you want to expand operations and set up new processes, or if you are looking at ways to save energy – talk to us.

You'll find we're much more than just sweet talk.

Many industries are starting to realize the full potential of energy efficiency as an important resource that can help meet future energy needs.

300 million US dollars waiting to be claimed every year!



Want your share of the pie?

Sugar production and refining involve the continual transfer of heat to and from the different juice flows, right from the first juice to the final molasses. Recovering more heat from your processes can help you use less energy and cut your production costs.

It's there to be taken

We estimate that the world's sugar industry could save USD 300 million* annually by using plate heat exchangers instead of less efficient solutions. For example, steam costs can be reduced by using lower grade heat sources such as condensate and low pressure vapour from the evaporation station or the vacuum pans.

So why not save your energy by upgrading to Alfa Laval plate heat exchangers? Use the excess steam to produce electricity to power your plant and, perhaps, sell the surplus energy to the national grid. Or, in colder parts of the world, produce hot water to feed the local district heating network, and generate extra revenues.

Your share of the pie is there to be taken.

*How did we arrive at the figure MUSD 300/annum?

We based it on the following assumptions:

World sugar production: 160 Mton per year.

Average sugar content in crop: 15%.

Average steam consumption: 0.4 ton per ton crop.

Average value of steam: USD 14 per ton.

Estimated potential for steam savings: 5%.

We can offer the whole package

Advanced heat exchangers and process know-how

Installing Alfa Laval plate heat exchangers is a highly effective way to reduce energy consumption in your sugar plant. We have units for a range of heating and cooling duties: WideGap plate heat exchangers for the sugar juices containing fibres, standard plate heat exchangers for the clarified juice, remelts, syrups and molasses, AlfaVap evaporators and AlfaCond condensers.

Although Alfa Laval plate heat exchangers are significantly smaller than shell-and-tube units, when used in sugar applications, their thermal efficiency is 200–300% greater. The financial benefits multiply from campaign to campaign.

Our complete offering for the sugar industry also includes energy efficient decanters and rotary lobe pumps.

By helping to recover more heat from your processes, Alfa Laval's products help boost energy productivity in your sugar plant, i.e., the level of output achieved from the energy consumed.

Your business has never been sweeter

Take advantage of our deep process know-how. We have more than 40 years' experience in meeting the needs of the sugar industry. We can advise you on all aspects of heat transfer and recovery and help you get the same results at various process stages using heating media with lower temperatures and lower pressures.

Alfa Laval plate heat exchangers enable you to recover more heat

They are extremely efficient – and easy to clean

In Alfa Laval plate heat exchangers, the herringbone plate design and countercurrent flow result in high turbulence and extremely efficient heat transfer.

Since you can achieve a very close temperature approach between the heating media and the juice, it's possible to use heating media with lower temperatures.

Alfa Laval plate heat exchangers can be used to recover heat from a wide range of sources and thus lighten the load elsewhere. For example, vacuum pan vapour and vapour from the last evaporation effect have historically been regarded as waste heat. By using these vapours as heat sources, you can reduce live steam consumption and lighten the load on the condenser at the same time.

How many positions are there in your plant where energy efficient Alfa Laval plate heat exchangers could replace traditional heat exchangers and save you money?

Cleaning is a piece of cake!

Unlike shell-and-tube units, plate heat exchangers are easy to clean and the job requires much less manpower. They can be conveniently cleaned, without opening, by using an Alfa Laval CIP (Cleaning-in-Place) unit. Their low hold-up volumes compared to shell-and tube units reduce the consumption of chemicals during the cleaning process.

More than 50,000 PHEs installed annually

Why do customers invest?

We supply more than 50,000 gasketed plate heat exchangers annually, for a wide range of applications, to customers all over the world, including many in the sugar industry. Why do they invest – is it our sweet talk – or could it be these hard facts?

Some benefits of plate heat exchangers

- Better heat transfer and less fouling due to high degree of turbulence in the media.
- More heat recovered and more energy saved thanks to counter-current flow, which enables crossing temperature programmes.
- Increased capacity using less floor area.
- Lower capital investment and installation costs, due to compact size and lighter weight. Easy to install in existing plant set-ups.
- Less maintenance and increased uptime – also the result of high degree of turbulence in the media, which reduces fouling.
- When cleaning is needed, PHEs can be cleaned quickly and simply by regular backflushing and by using Alfa Laval CIP (Cleaning-in-Place) systems.
- PHEs offer maximum flexibility to adjust to future needs since they can easily be extended or reconfigured.

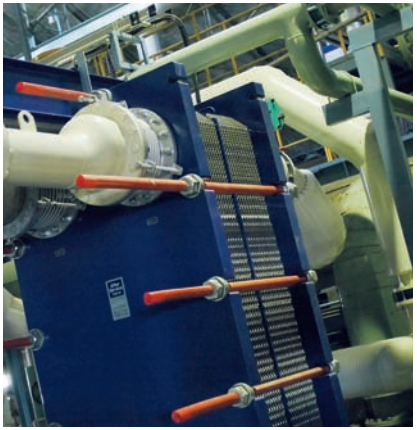
Install Alfa Laval equipment and you gain access to a world-class parts and service organization that will help you get the most out of your installation. We're just a phone call away, 24 hours a day, 365 days a year.

Don't take our word for it

Plate heat exchangers continue to offer our customers a sweeter and sweeter deal in a wide range of industries worldwide.

If you still think it's all just sweet talk, take a look at these reports from Alfa Laval customers in the sugar industry.

Planned energy savings achieved



Hokuren Nakashari, Japan

The Hokuren Federation of Agricultural Cooperatives began installing AlfaVap rising-film plate evaporators at its Nakashari beet sugar factory in 1992.

Impressed by their high heat transfer performance and compact design, in 2005 Hokuren installed four AlfaVaps to help recover energy from the process steam. An AlfaCond condenser was also installed.

"Installing more Alfa Laval equipment was an important part of our plans for cutting energy costs," says the Sugar Production Manager. "It is far more efficient than the equipment we had previously, and maintenance is much easier. We've accomplished the energy savings we hoped for."

Facts

Energy savings
Easier maintenance
Compact design

Plate technology boosts capacity

PT Angels Products, Serang, Indonesia

Indonesia's largest sugar refinery, PT Angels Products, boosted its capacity in 2005 by installing a complete sugar evaporation system utilizing plate technology from Alfa Laval. It includes three AlfaVap plate evaporators and an AlfaCond condenser.

Operation Director James R. Isman says: "I have good experience of Alfa Laval and we now have the most efficient, up-to-date evaporators on the market. We were the first sugar refinery in Indonesia to invest in this technology, and others are following." The plant has an output of 1,100 tons of refined sugar per day.

Facts

Steam consumption reduced by 50%
Reduced load on vacuum pans
High flexibility

Live steam consumption reduced

SantelisaVale, Sertãozinho, Brazil

At its Sertãozinho sugar and ethanol plant, SantelisaVale uses excess steam from the process to generate electricity, which is sold to the national grid.

In 2002, to conserve more live steam for power generation, six Alfa Laval WideGap plate heat exchangers were installed, replacing old, inefficient shell-and-tube units. Designed to handle fibrous media, the WideGaps immediately dispelled customer concerns that fibres in the product could clog plate heat exchangers.

"The WideGaps work very well and consumption of live steam is down by 40 to 50%," says João Carlos Francisco, Production Manager for sugar extraction.

Facts

Live steam consumption reduced by 40-50%
Lower grade heat sources used
Electricity generated, sold to the national grid

WideGaps help cut energy consumption

Nordic Sugar Örtofta, Eslöv, Sweden

In 1999 Nordic Sugar's Örtofta Mill in Sweden added a sixth evaporation step. Six WideGap heat exchangers from Alfa Laval, offering close temperature approach, were installed as prelimed juice heaters.

Now, with energy consumption down, the mill sells its surplus energy to the local district heating grid.

Production Manager Jerker Magnusson: "The introduction of WideGap plate heat exchangers was the breakthrough for plate heat exchangers in the raw sugar process. The WideGap really works on demanding fluids and the heat economy is superior."

Facts

Energy savings per ton of beets 2.8 kWh
Beet processed 2009/10, 2,450,000 tons
Total annual energy savings 6,860 MWh

Boosts evaporation capacity at Australian cane sugar mill

Mulgrave Central Mill, Queensland, Australia

In 1992 Mulgrave Central Mill installed a standard plate heat exchanger 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%. 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."

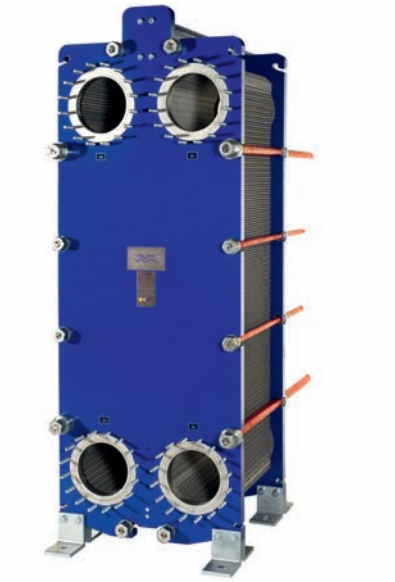
Facts

Evaporator capacity increased by 2.5–5%
Low maintenance costs
Trouble-free operation

Alfa Laval products for the sugar industry

Standard plate heat exchangers

We supply a comprehensive range of plate heat exchangers for heating and cooling of clarified juice, remelt, syrups and molasses. Giving high performance with low hold-up volume, these units offer high thermal efficiency. Their compact design results in small quantities of materials used for heat transfer surfaces. Installation cost is low and the units are easy to clean and to dismantle for inspection.

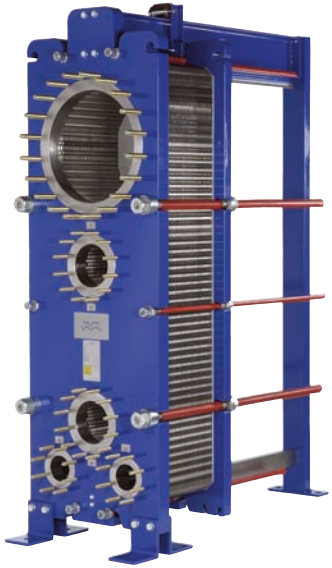


WideGap plate heat exchanger

WideGap takes over where conventional plate heat exchangers reach their limitations. It is specially developed for fibrous media, such as raw juice and limed juice. A gap of up to 17 mm between the plates allows fibres and particles to flow easily, minimizing clogging and maximizing process uptime. The WideGap is suitable for various heating media, such as liquids, steam and low pressure vapour.

AlfaVap rising-film plate evaporator

The unique AlfaVap design provides much higher thermal efficiency than traditional shell-and-tube evaporators of, for example, the Robert type. In an AlfaVap evaporator, the sugar juice has a significantly lower residence time, which reduces the colour formation and gives higher product quality. The AlfaVap is suitable for complete evaporation systems in sugar refineries or as boosters to existing Robert evaporators in sugar mills. The low weight, compactness and versatility of the AlfaVap design allows it to be mounted virtually anywhere to extend the evaporation capacity of an existing installation.



AlfaCond plate condenser

The AlfaCond plate condenser is ideal as a vacuum condenser in evaporation or crystallization systems. Tailor-made for low-pressure condensation, AlfaCond is a good alternative to a conventional shell-and-tube condenser, which is up to three times bigger. As legislation on wastewater treatment becomes increasingly demanding, AlfaCond is also an option for installations where barometric condensers have been the traditional choice. Since AlfaCond keeps the condensate separated from the cooling media, there are savings to be made in the cooling water and waste-water treatment. The asymmetric hole configuration makes the AlfaCond an efficient condenser with a small footprint.

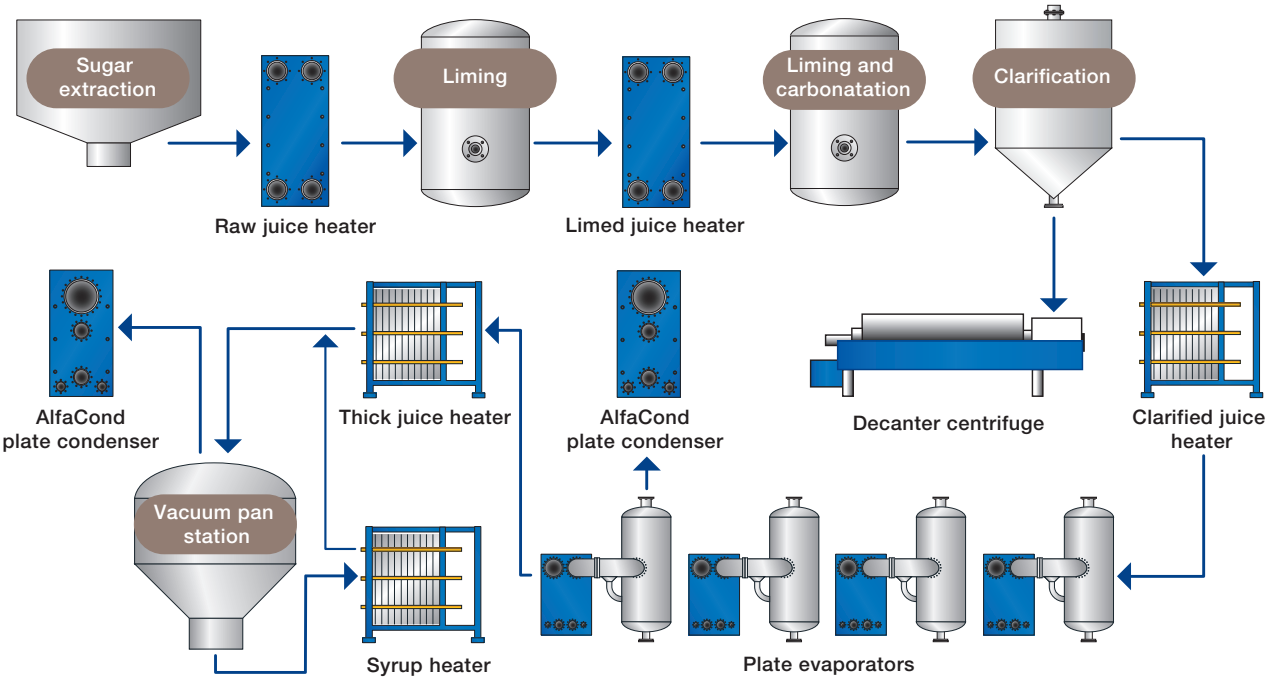
Rotary lobe pumps

Rotary lobe pumps are suitable for highly viscous fluids, such as syrups, massecuite and molasses. They are very robust and durable even when handling abrasive media containing crystals. Rotary lobe pumps feature a compact design and consume less power than other pump technologies.

Decanter centrifuges

Decanters are an efficient alternative to traditional rotary vacuum filters for sugar mud and have many advantages. These include: lower power consumption, higher cake dryness and lower sugar content in the final dewatered mud. Since it is not required as a precoat, bagasse can be saved and can be used for power generation. There is also lower inversion loss due to short retention time and no bagasse mixing. In sugar refineries decanters are used to dewater sugar scum from the raw sugar clarifier, reducing sugar loss, saving water and reducing disposal problems.

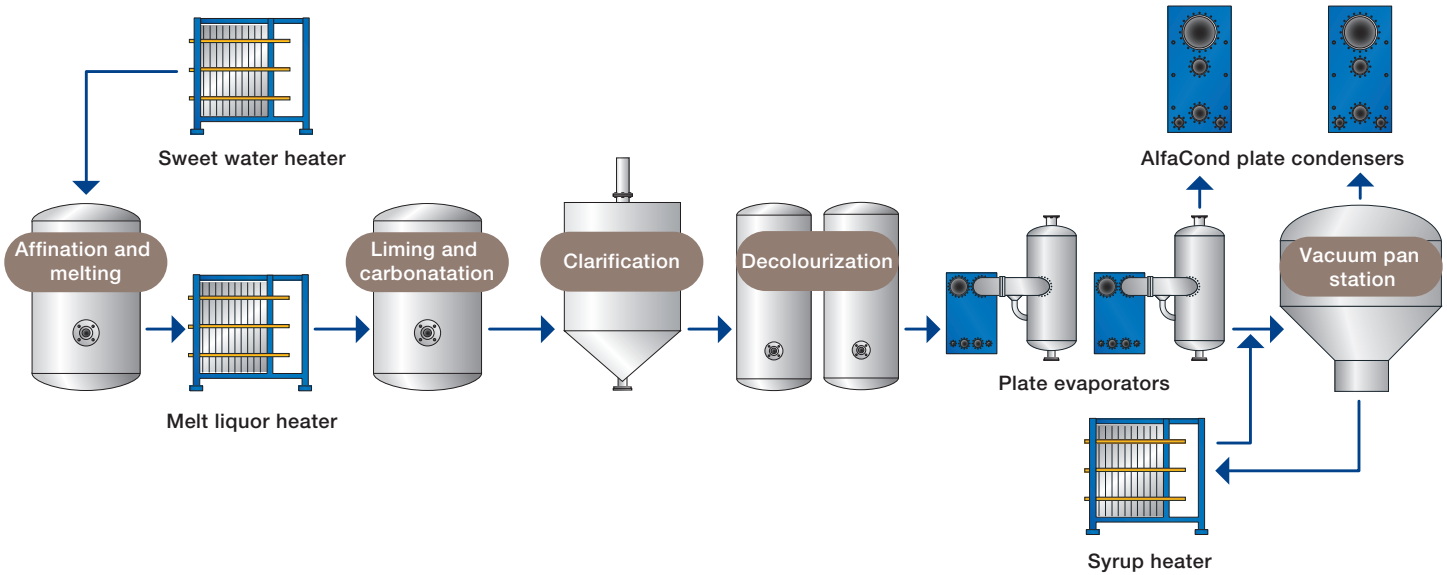
Recovering heat in the sugar process



Raw sugar process

Raw juice heater and limed juice heater:
With WideGap heat exchangers installed, lower grade heat sources, such as condensate or pan vapour, can be used in order to save more valuable steam.

Clarified juice:
By using vapour bleed-offs and condensate from the evaporators as heat sources, energy consumption will be reduced and the capacity of the evaporators maximized.



Sugar refinery

Plate evaporators:
Energy efficient evaporators with low residence time and high flexibility.

AlfaCond plate condensers:
The condensate is not subcooled and can be taken back to the front end of the plant. The cooling water is kept clean from sugar residues, which minimizes the need for water treatment.

Want more sweet information?

More information about Alfa Laval's range of reliable, energy saving heat transfer products for the sugar industry is as close as your computer. Our website contains in-depth case stories, detailed product information, application overviews and much more.

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