



Bronswerk Heat Transfer provides cool solutions

Bronswerk Heat Transfer B.V. (Bronswerk) is a Dutch company that was founded in 1940 in a small village in The Netherlands and has developed itself over the years into an organisation that provides cooling solutions worldwide. Bronswerk's mission is to provide the best possible solution for heat transfer and fluid-flow systems in any given situation and they definitely do not shy away from difficult assignments and challenging situations. Quality, innovation and sustainability are key factors that Bronswerk operates from when optimising installations in the power, gas, oil, chemical, and air handling industries. In addition, the company is very service-oriented, which led to the establishment of their own service and maintenance department, that is located at a different location than their headquarters. Managing Aging Plants got in contact with Chris van den Elsaker and Evert Poss, to learn more about all the cool solutions Bronswerk provides.

By Jolanda Heunen



Whizz-Wheel installed in cooler bundle to increase efficiency

Chris van den Elsaker is Manager Procurement, Logistics, and Production Operations at Bronswerk Heat Transfer B.V., has been with the company for a little over eighteen years already, and is still passionate about optimising cooling systems.

"Air-cooled cooling systems use the outside air to cool part of a production process. These systems are logically positioned outside a facility, which however has a few downsides," Mr. Van den Elsaker tells. "Not only do these coolers take up a lot of space and consume a huge amount of energy, they also produce quite a bit of noise. And the least favourable part is that they are prone to pollution of the bundles, which limits the capacity of the cooling system."

Bronswerk has come up with a solution to clean the bundles quickly and efficiently, with less or even no downtime. In addition, the company takes forthcoming regulations into account by offering a way to make an existing plant future-proof with regard to noise constraints and energy consumption restrictions.

The complexity of coolers

Air-cooled coolers use the ambient temperature to cool part of a process, therefore the coolers are always installed outside. "This makes a cooler very sensitive to factors that affect their capacity, such as crosswinds, or pollution through dust and pollen," Mr. Van den Elsaker explains. "Furthermore, the

noise that the fan of a cooler produces is becoming more and more subject to legal restrictions. And last but not least, coolers consume a lot of energy, which is of course not particularly desirable."

Dry cleaning against pollution

The regular solution for cleaning bundles is by using water on the outside, in which case often only the first row gets cleaned, producing a result that is far from optimal. "And when you use this way of cleaning, the fins can get sprayed flat, which will reduce heat transfer even further," Mr. Van den Elsaker tells.

Bronswerk therefore uses an alternative cleaning method, which is dry cleaning. When utilising this cleaning method for the blades there is no need to walk over the bundles, and fins remain undamaged. "For dry cleaning we use a non-toxic and biologically degradable powder," Mr. Van den Elsaker explains. "Dirt is blown off the fins by spraying this powder onto the bundles using low air pressure, only 5 to 6 bar. In this way all the rows of the fins are cleaned and when induced draft is used, the fans don't even need to be switched off. We use this option because it guarantees minimal downtime, and greater reliability and availability, as well as maximum output of the asset."

Reducing noise and energy use

After the bundles have been cleaned, the solution can even be taken one step further, for which the effects that surroundings have on the cooling system are taken into account, such as the ambient



Installation of complete cooler bundle adjusted with Whizz-Wheel



Whizz-Wheel



Welding of piping

air, the wind, and high temperatures. "Wind for example plays a major role in an A-frame as the pressure drop over the bundle, and therefore the air speeds, are relatively low," says Mr. Van den Elsaker. "So after dry cleaning, the capacity of the cooling system has returned to the desired level, but will still be affected by crosswinds and even wind in general." In addition, the stricter (European) regulations for noise and energy consumption – that will come into effect in Germany in 2017 for example – can pose great problems for plant owners. After all, when production needs to be reduced to for example just 65% because of noise violations, this leads to loss of revenue. And this is not even the worst scenario, it could also be the case that a plant needs to be closed completely because it is impossible to comply with permitted noise levels with the assets that are in use.

The Whizz-Wheel

Bronswerk has taken industrial cooling to the next level with the invention of the Whizz-Wheel, an intelligently engineered fan that produces hardly any noise. "For high efficiency cooling with extensive noise reduction, we retrofit an existing plant using the Whizz-Wheel fan," Mr. Van den Elsaker tells. The Whizz-Wheel is an innovative system that is not only a very effective but also a sustainable cooling solution. The fans can have a diameter of up to ten meters and it doesn't have the typical gears or V-belts that traditional fans are equipped with. The Whizz-Wheel is the most quiet axial fan in the world and because it uses much less energy than traditional systems, Bronswerk's customers can realise substantial cost reduction. "By implementing the Whizz-Wheel, the noise-reduction that is realised

enables our customers to return to 100% production. In addition, with the Whizz-Wheel energy savings of around 50% can be realised," Mr. Van den Elsaker explains. When implementing the Whizz-Wheel cooling system, limited plot space and sometimes limited capacity or cable diameters are all taken into account by Bronswerk.

Cool solutions

Debottlenecking and revamping existing installations to improve capacity within set requirements, while keeping original equipment in tact as much as possible, is typically the type of challenge that Bronswerk gladly accepts. Their cooling solutions are success-

fully implemented in existing plants of companies all over the world, of which LyondellBasell is a good example.

Solutions for LyondellBasell

The systems, including air coolers, of LyondellBasell have been in operation since 1970. Bronswerk was commissioned by engineering agency Jacobs to improve the capacity of two bays of LyondellBasell's induced draft air cooler. LyondellBasell specified a few additional, new requirements that had to be taken into account. The two requirements that posed the biggest challenges were that any extra motor capacity that was needed had to be within the limits of existing cables (30 kW) which were not being replaced, and





Installation of bundle in heat exchanger

that noise emissions would preferably not exceed 74 dB(A) because of noise restrictions and environmental concerns. In addition Bronswerk needed to establish 10% more cooling capacity and on top of this find out if it would be possible to create a 15% extra cooling capacity (overcapacity).

"The latter already proved to be impossible if we would use a 'traditional' solution," Mr. Van den Elsaker tells. "Moreover, the math work of both noise emission and motor capacity just didn't add up for the traditional fixes." Bronswerk then considered a third option, the possibility to integrate the Whizz-Wheel cooling system. This proved to not only fit into the specified noise emission (70 dB(A) was the result) and motor capacity requirements (with 22 kW well within the cable tolerances), but also yielded another 5% of overcapacity on top of the 10% extra cooling capacity. "And we completed this assignment in a very short time as well, we received the order in October and completed the system in March of the next year," Mr. Van den Elsaker states.

Bronswerk Heat Transfer Services B.V.

In addition to manufacturing equipment, Bronswerk Heat Transfer has grown towards providing more and more service for their customers. "With the transformation of equipment supplier to system supplier of heat exchange equipment, we also wanted

to provide more services," says Evert Poss, who is Director at Bronswerk Heat Transfer Services B.V., the Bronswerk subsidiary that is completely devoted to service and maintenance works.

Providing service and maintenance for clients was started in 2013 already, when a special department was created for this purpose. This year the company decided to give this part of their business more visibility. "To position ourselves more clearly in



the market as a service provider of heat exchange equipment we established Bronswerk Heat Transfer Services B.V. on January 1, 2016," Mr. Poss continues. "Our aim is to free our clients from any burden that a refurbishing project may pose. It often happens that we act as general contractor for the re-tubing of a number of heat exchangers. In these cases we manage a number of disciplines in addition to the mechanical site work and re-tubing itself, such as industrial cleaning, insulation, scaffolding, asbestos removal, and horizontal-vertical transport. We thus take care of the complete project management." Costs can be reduced through optimised maintenance works, since a well maintained installation consumes less energy. "We provide solid and fast solutions for installations that aren't functioning properly," Mr. Poss explains. "We research the matter, uncover the focal point of the problem, and come up with a solution that restores both the availability and reliability of the asset of installation." All the people that work for Bronswerk are highly trained and VCA certified. The company breathes innovation and is both high-tech and creative, both down to earth and avant-garde in its solutions, which results in inspiring solutions with beneficial side effects. "Maintenance saves money. Bronswerk provides reliable systems with high availability, minimal downtime and maximum output," Mr. Poss concludes.

Bronswerk Heat Transfer Services B.V. is located in Vierpolders, which is at the heart of the port of Rotterdam, one of the world's busiest ports and the largest port in Europe.

Core activities include:

- Mechanical integrity inspections
- Rotating integrity inspections
- Thermographic integrity inspections
- Vibration analysis
- Remote Controlled Equipment Monitoring Services
- Service Level Agreements
- Mechanical and Thermal Engineering Support
- Dynamic balancing services
- Mechanical & Rotating Services
- Re-tubing
- Bolt torqueing
- Erection & Commissioning
- Turnaround activities
- Spare parts supply
- 24/7 call-out service