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Brand of Nexson Group

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State-of-the-art technology for carcass cooling

Located in Toledo City, Brazil's state of Paraná, one of the world's biggest players in the food market makes full use of Güntner Group's vast portfolio. Utilising a wide variety of products, they are able to ensure sustainable operation in their plant throughout the year.

When it came time to enlarge the refrigerating plant, currently processing around 7,000 hogs per day (approx. 714 tons/day) with state-of-the-art technology, the know-how of Güntner Brazil and Therm Tech proved invaluable in support of the project.

A new cooling concept for minimum weight loss

The specifications were clear: Energy-efficient heat exchangers in different technologies for a variety of applications in the existing NH_3/glycol system were needed.

A total of 145 Güntner air coolers, type MGN and MDGN, were delivered and installed with naval aluminium fins for high mechanical resistance against aggressive atmospheres and high-pressure cleaning processes (up to 220 bar).

Overview

Line of Business:	Industrial Refrigeration
Application:	Meat
Country/City:	Brazil/Toledo City
Fluid:	NH_3/Propylene Glycol 25 %
Product:	Güntner Air coolers S-MGN, S-MDGN Güntner Evaporative Condensers ECOSS 3000, ECOSS 850 TRRF thermowave plate heat exchangers TL0650 KCKL – 1500, TL0250 TDGL – 1000 Frost Frio Pressure Vessels SCHL

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Güntner ECOSS NLA3

Güntner ECOSS NLA3 on the roof top

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Keeping in-line with the project specifications, detailing an excellent control of the processes and reduction of the energy consumption, the equipment included more than 200 EC fans (electronically commutated), resulting in yearly energy savings of approx. 17,000 U$.

Running with 25% propylene glycol, all Güntner air coolers were designed to operate in a secondary system cooling rooms for the pork carcasses with a sophisticated concept to keep the carcasses' weight loss to a minimum.

Güntner's air coolers that were destined for carcass cooling rooms with limited dimensions were built with a special design fan housing to allow a 45° down draught. This allows a full size unit to fit in the restricted space, meaning it was still possible to achieve the same energy efficiency and performance for cooling the carcasses, all while minimising weight loss.

This innovative solution ensures that the maximum carcass weight loss does not exceed 1.7 %, which equals savings of approximately US$ 6,450 per day. This is an annual saving of US$ 2,320,000 when compared to weight losses of 2.3 % in the former system.

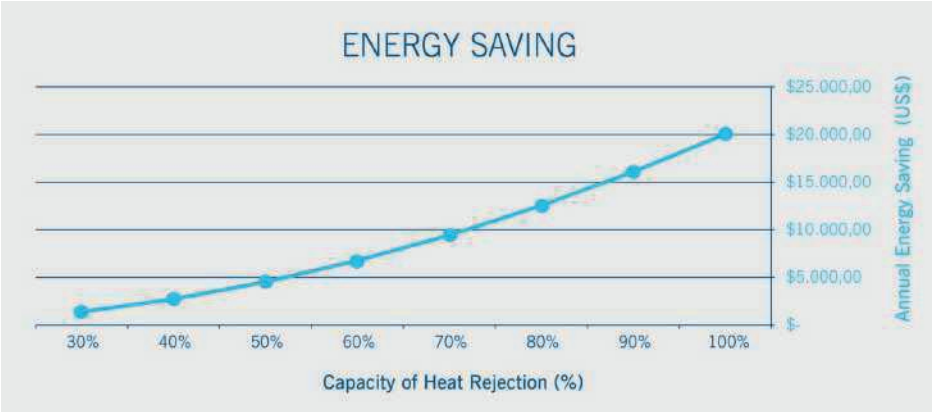
Comparison of conventional processes vs. Güntner solution

- Conventional processes: 714 tons/day of processed meat; carcass losses: 2.3 % = 16.4 tons/day
- Minimised weight loss with Güntner solution: 714 tons/day of processed meat; carcass losses: 1.7% = 12.1 tons/da
- Difference: About 4,284 kg/day (about 42 hogs at an average price of around US$ 1.55/kg resulting in approx. US$ 6,450 per day)

ECOSS, the best solution in evaporative condensing to save resources

With the strong focus on reducing energy consumption and controlling the processes, it was natural to select evaporative coolers (evaporative condensers and fluid coolers) from the Güntner ECOSS series. Confirming and strengthening the concept of efficiency and sustainability with an environmentally friendly product, the ECOSS series units come with EC fans and intelligent GMM controllers.

With a multitude of benefits related to low operating and maintenance costs coupled with low water consumption, high energy efficiency and high thermal performance, Güntner's ECOSS series of units greatly surpass the concept of "Eco-friendly", especially being built for a long service life using a manufacturing process which is noteably less aggressive to the environment.

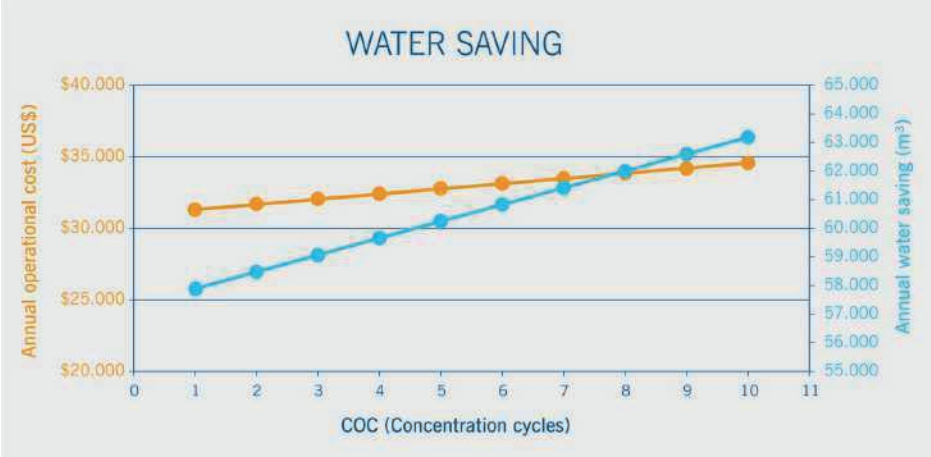


Güntner S-GHN

Thermowave plate heat exchangers

High efficiency in secondary systems with plate heat exchangers

The cooling of the propylene glycol mixture used in the secondary circuit is achieved by an efficient system utilising thermowave ammonia plate heat exchangers. This cascade system uses the natural refrigerant NH_3 to cool down the propylene glycol circuit to provide greater operational safety for the application. Due mostly to the low NH_3 refrigerant charge and the restricted use; it is only used in the machine room, while propylene glycol (innocuous for the employees) is used for the cooling and the air conditioning.



Two Güntner ECOSS evaporative condensing units are installed in conjunction with the Thermowave plate heat exchangers that are used to cool superheated NH_3 (de-superheating) for heat recovery. This solution offers great operational benefits due to energy savings achieved in the compressors. In addition, it is possible to use the recovered heat to warm a total of approx. 40,000 m³/year of water used for general services, resulting in savings of approx. US$ 11,300 per year.

In order to complement the energy-optimized system with low water consumption, an additional Güntner ECOSS unit operates as an evaporative fluid cooler (cooling tower on closed-circuit) to cool the compressor oil resulting in a secure, controlled, energetically optimized and sustainable operation.

Resources	Yearly savings***
Reduction in energy consumption (air coolers with EC fans)	US$ 15,460
Reduction in carcass weight loss	US$ 2,320,000
Savings in energy consumption (ECOSS units with EC fans)*	US$ 20,166
Savings in water consumption (ECOSS)**	US$ 32,240
Savings in water consumption (ECOSS)**	60,238 m³
Heat recovery (warm water – de-superheating)	US$ 11,260

(*) Compared to conventional systems in galvanized steel with frequency converter.

(**) Compared to galvanized condensers of the same capacity, and based on 5 concentration cycles per day (COC).

(***) Data based on values of US$ 0.11/kWh, US$ 0.51/m³ treated water and US$ 0.04/kg firewood.

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