

Poultry processor cuts costs with efficient waste heat recovery

Result

- 72% reduction of heat energy cost
- 15,000,000 gallons of water saved annually
- Waste heat recovery of 10.8 MMBtuh (3.2 MW)
- 5.9 coefficient of performance heat pump
- Non-ozone depleting refrigerant with zero global warming impact
- CO2 reduction of 3 million pounds per year
- Vilter™ single screw compressor with ammonia refrigerant achieves increased performance
- 15% higher efficiency than comparable technologies
- Design for 20 years service without costly maintenance



Application

Innovative ammonia heat pump plant utilizing heat extracted from refrigeration for energy saving heating and cooling system.

Customer

Chile's leading poultry processor.

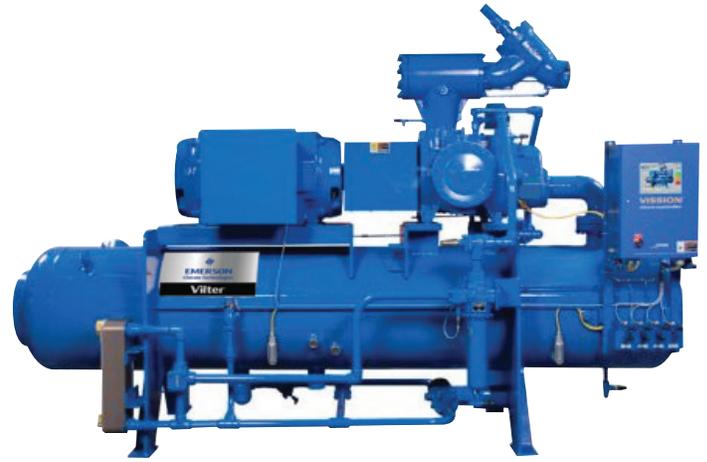
Challenge

Energy costs are significant for poultry processors. Chile's leading poultry processor relied on boilers to heat up to 350 gallons per minute of well water for their sanitation needs. At the same time that heat was being added to the water, heat was being removed from the poultry being processed. This heat was discharged to the environment.

This poultry processor realized that they were spending money to buy heat while at the same time spending money to waste heat. They realized that if they could capture the waste heat from processing, they might be able to use it to heat the water.

This producer wanted the highest coefficient of performance (COP) possible, and a technology solution with low annual operating and maintenance costs. The system needed to use a non-ozone depleting refrigerant with zero global warming impact.

One of the few refrigerants that could meet all of their efficiency and environmental requirements was ammonia, an efficient refrigerant (designated as R-717) most commonly used by the food and beverage industry for process cooling and refrigeration. Ammonia does not contribute to ozone depletion or global warming and can be used in a heat pump to reduce total energy demand.



Solution

The ammonia heat pump system delivers hot water for sanitation at 126°F using heat extracted from refrigeration and features Vilter™ single screw compressors. With the new system, heat taken from their 14°F refrigeration load is lifted to 126°F in one stage for heating. Since commissioning in January 2012, the facility is heating 350 gallons per minute of water. And this hot water is delivered far more efficiently than from their previous boiler. The ammonia heat pump solution has reduced heat energy cost by 72% and saves fifteen million gallons of water per year. By using ammonia, Emerson's compressor technology solution offers a refrigerant that has a good environmental profile (non-ozone depleting and zero global warming impact), delivers higher temperatures and provides superior performance benefits from its consumed resources than competing technologies. In addition, the balanced radial and axial force design of the single screw compressor reduces stress on the unit's bearings, resulting in very low operating and maintenance costs while delivering a performance unachievable with any other type of compressor.

Resources

Learn more about the Vilter single screw compressor at:
EmersonClimate.com/IndustrialHeatPumps

EmersonClimate.com

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