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Waste heat for malt kiln

The European malt producer Malteurop uses waste heat from refrigerating machines at its plant in Heidenau, Germany, for a malt kiln. The cold is produced for the germination process. The company has opted for Guntner air heater coils as well as thermowave plate heat exchangers.

When malting barley is made to germinate with water and oxygen during malt production, this generates heat. During this process, the oxygen demand of the malting barley steadily increases, whilst the temperature in the germination chamber also rises. The germination process in the malthouse only takes place under optimal conditions if the malting barley is kept at 12 – 16 °C for several days. Therefore, fresh, chilled, humidified and oxygen-rich air is fed into the germination chamber.

In the machine room of the European malt producer Malteurop in Heidenau, two frequency-controlled water chillers with screw compressors, connected in parallel, are operated for this purpose. The refrigerant is R134a. The cold from the glycol-water mixture (2 °C/6 °C) is transferred by means of a TL0500 TAGL thermowave plate heat exchanger to the process water of the spray water cooler in the germination chamber (12 °C/4 °C). A redundant plate heat exchanger of the same type is used during cleaning and maintenance work.

The process water for the germination chamber is filtered and circulates in the refrigeration cycle in Heidenau: The spray water cooler atomises the water in the ambient air. This ambient air, thereby cooled and saturated with process water, is directed through the germination chamber.



Overview

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| Line of business: | Industrial Refrigeration |
| Application: | Beverage Cooling/Energy & Process Cooling |
| Country/City: | Germany/Heidenau |
| Fluid: | R134a/Glykol-water-mixture |
| Product: | Guntner GCO air heater coils thermowave TL0250 TAGL; TL0500 TAGL |

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The European malt producer Malteurop uses Guntner air heater coils as well as thermowave plate heat exchangers in its refrigerating plant.



Ten Guntner GCO air heater coils (still without casing in the image) produce hot air for the kiln.

Compressor waste heat for the kiln

The usable heat from the refrigerating machine as well as the waste air from the kiln are transferred to a 34 % glycol-water circuit (45 °C/41 °C). This circuit, in turn, heats the hot air for the kiln from 29 °C to approximately 46 °C. Ten Guntner GCO air heater coils are used during this process for maturing the germinated barley.

In order to achieve the required overall capacity, the coils were built one above the other as a tower and the fluid passes through in parallel. Each individual coil has a capacity of 156 kW and heats the air from around 29 °C to approximately 44 °C. At the same time, the brine cools from 47 °C to about 42 °C. The air volume flow at the outlet of each unit is about 33,000 m³ per hour.

An adjoining Guntner heating element composed of six GCO air heater coils stands directly in the kiln. It then further heats the air by means of a hot water circuit (110 °C/73 °C) to temperatures of between 85 °C and 95 °C, as required. The air volume flow at the outlet of each unit is about 42,000 m³ per hour. The germ buds fall off during the drying process, and are sieved off and sold as a high-quality ingredient for mixed feed.

During the summer, not all of the waste heat from the compressors is required for the air preheating in Heidenau. Two additional TL0250 TAGL thermowave plate heat exchangers (including a redundant one here, too) from the thermoline series function as emergency coolers to conduct the excess heat from the cooling process to well water (12 °C/25 °C) via a glycol-water circuit (45 °C/40 °C).