TINE

Brumunddal - Norway

Dairy Food Industry

Plant and offices

Hydronic System

Year 2006

TINE is Norway's largest producer, distributor and exporter of dairy products.

Brumunddal plant is part of a thriving Dairy Cooperative founded in 1856, and processes over 50 million litres of milk into dairy products every year.

The Challenge

"The dairy industry must strive to be a profitable and environmental friendly industry characterised by pure products of high quality, a clean environment and use of environmental friendly technology". This is TINE's Environment Objective since 1988.

Environmental assessments form an important part of the criteria on which the company bases its decisions, both when establishing new products and when assessing new production technologies.

Milk is the main raw material for TINE, therefore protecting nature is in its interest in order to provide pure, high-quality products.

To guarantee quality to its customers, TINE takes special care of production too. Its products are in fact particularly delicate foods that need absolutely reliable manufacturing processes and equipments.

For the same reason manufacturing processes are subject to public legislation and strict controls in obedience to international procedures and standards.

In 2006, because of the company growth, TINE enlarged the Brumunddal plant.

The requirements for the air conditioning system of the new production areas and offices were therefore very clear: environmental friendly, non polluting, operating with maximum energy saving and highly reliable to guarantee stable temperature and humidity to products otherwise highly perishable.

TINE BA – The plant and a commercial banner
www.tine.no / www.jarlsberg.com

The building

- Food production areas
- Dry warehouse
- Offices and service

The team

- Client TINE BA
- Air conditioning supplier Klimax AS

About TINE Group

TINE Group is Norway's largest food industry and the most important Dairy Cooperative of the country. It is owned by 15,847 members and has 5,734 employees, over 50 plants in Norway and various subsidiaries in Norway, Sweden, Denmark, Great Britain and United States.
The Group processes 1,464 million litres of cow's milk and 19 million litres of goat's milk in over 200 dairy product varieties sold under the TINE trademark. It deals also in other food products such as fruit juices, desserts, ice creams and fish.
TINE Group had a 2.7 million dollars revenue in 2008. (Data *Annual Report 2008*)

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The Solution

The heating of TINE Brumunddal plant in wintertime is entrusted to district heating, while cooling in summertime to direct expansion systems based on chillers.

The air conditioning system prior to the 2006 enlargement was a Clivet air-to-water chiller. Considering the client satisfaction with the old system, Clivet products have been chosen for the air conditioning of new plant too.

In particular, production areas reserved for milk processing are served by 5 air handling units for filtering and distribution. They are supplied by a high efficiency air-to-water SPINchiller, a chiller that is particularly suitable for the management of partial loads typical of production areas.

A chiller that supplies low temperature water is reserved to the maintenance of the right temperature and, most of all, to the dehumidification of the warehouse for dry products, such us powder milk. In this case too, filtering and distribution are committed to a air handling unit.

The office area is served by 2 air handling units and has, together with the already existing chiller, a new high efficiency air-to-water SPINchiller.

The results

Thanks to the high efficiency chillers adopted for the plant enlargement, the Company has been able to fulfil its quality standards.

In particular the reliability of SPINchiller technology constantly assures the right ambient conditions for high quality dairy food production and warehousing. At the same time it optimizes consumption at any load condition.

Operating expenses due to activities such as chiller management and maintenance have been considerably reduced too. SPINchiller units, in fact, do not require particular settings because they auto-adapt themselves to the ambient they have been placed in. Moreover their maintenance is very easy thanks to their modular structure.

In this way operating costs have been reduced to the minimum, and most of all the respect for environment and therefore for TINE's first raw material is totally assured

For further information about Clivet Systems:
www.clivet.com

TINE BA – Chiller for offices and chiller for production areas
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The System

- One Clivet air-to-water SPINchiller WSAT-SC chiller, 650 kW, with high-efficiency Scroll technology for production area air conditioning
- One Clivet air-to-water SPINchiller WSAT-SC chiller, 200 kW, with high-efficiency Scroll technology for office air conditioning
- One Clivet low temperature water-to-water WRH-2 chiller, 140 kW, for dehumidification in the dry warehouse
- About 1 MW of overall cooling capacity

About SPINchiller

A range of coolers and heat pumps offering maximum annual efficiency (ESEER) for mainly partial load applications, such as civil air-conditioning. The use of several Scroll compressors in the same cooling circuit ensures a greater exchange surface area at a reduced load, therefore lowering consumption even by 50%, increasing reliability thanks to their toughness and world-wide diffusion and improving maintenance due to their modular design and limited bulk.

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