

Cost-optimised cooling for highest requirements



Günaydin, Alasehir, Turkey: 3D graphic of the project before the laying of the foundation stone

Line of Business:	Industrial Refrigeration
Application:	Fruit and Vegetable Cooling
Country / City:	Turkey / Alasehir
Fluid:	R134a, R507A
Product:	Wall/ceiling unit cooler GHN, Blast freezer GFN, Process unit cooler GBK, Condenser GVH

In two recent large projects for fruit and vegetable refrigeration, the companies Frigotechnik Handels GmbH, Wülfrath, in co-operation with Kälte-Klima Peters from Meerbusch and Güntner, Fürstenfeldbruck, yet again brought proof of their competence in the refrigeration of foodstuffs. In both cases, the buildings were fitted with Güntner evaporators and condensers. After commissioning of the systems, as a special, additional service, the wholesaler, together with ISS Krefeld (Engineering Office Sven Schulte) offers his customers individual energy-consumption analyses, thus promoting energy- and cost-saving operation of the systems. The refrigeration of fruit and vegetables in the import-export business is one of the most demanding areas in foodstuff refrigeration, because the quality of the most sensitive fresh goods must be reliably maintained throughout all transit stations. For

the equipment of one completely new storage facility each for Rosenland Fruit Import in Mönchengladbach, Germany (see separate reference project "Unique service"), and for the Günaydin fruit and vegetable export company in Alasehir, Turkey, however, it was not the value of the goods alone that made the highest demands. The high volume of goods in transit required special energy- and cost-saving equipment.

The Günaydin company, with headquarters in the German seaport of Hamburg, had approached the Peters company at the IKK 2002 trade fair, and after earnest deliberation decided for a partnership of trust with Peters and Frigotechnik. This family firm, with currently 320 employees, exports fruit and vegetables from all over Turkey to almost all of Europe. With Günaydin's growing needs in mind, the refrigeration and air conditioning experts erected a completely new plant for storing the valuable export goods in Alasehir, Turkey, in May and June 2003. "An extremely ambitious project," Managing Director Christoph Peters explains. "After all, the aim was to maintain 98 % relative humidity inside, in spite of temperatures of 35 °C outside." For this reason, the plant was planned by C.-Dieter Penno and Jan Schulte of Frigotechnik in close cooperation with the Department of Agricultural Research at the University of Istanbul.



Type S-GBK processing room unit coolers: These ensure product quality in the consignment area. The units are specially developed for processing rooms, where they ensure quiet, draught-free airflow.

Optimisation exceeds European standards

Günaydin achieve a throughput of 610 tonnes per week, and transport their goods for export in 20 refrigerated trains a week from Alasehir to Hamburg. To preserve the quality of the

fruits and vegetables, they are cooled from an average of +35 °C to +2 °C on delivery to Alasehir. Sensitive goods, such as strawberries or cherries, are additionally blast frozen at -30 °C. The refrigerants used at Günaydin are R134a for normal refrigeration and R507A for deep freezing. The refrigeration was applied to a total of 4500 square metres of cold storage via two groups in the normally refrigerated area – each implemented with 5 Bitzer Type HSK 7471-70 screws in Economiser Mode – and a deep-freezing cascade with two Bitzer Type HSKB 7461-40 compressors with an accumulated power of 130 kW.



Güntner aircooled condenser (axial) GVH: Despite outside temperatures of 35 °C, Güntner condensers provide sufficient condensing capacity and Güntner evaporators maintain a relative humidity of 98 % indoors.

For condensing, one plate heat exchanger and two Güntner type GVH 092C/ 2x6n(D) air-cooled condensers (axial) were used. In this plant, too, hotgas defrosting and distributed controls via Siemens S7 PLC ensure energy and cost-saving operation. "We have achieved a degree of optimisation here that goes far beyond the European standard," says Frigotechnik engineer Penno, and he continues, "Because of the very sophisticated planning and our good experience of the Güntner units, we decided on Güntner evaporators throughout this project as well." To cater for the characteristics of the different varieties of fruit and vegetable in the refrigeration process, Frigotechnik selected a total of 29 type GHN unit coolers in five different power ranges for the refrigeration cells. In the deep-freeze area, two type GFN 065C/412 blast freezers take care of reliable conservation of the goods. The floor-mounted fan-type aircooler with its powerful fans and horizontal direction creates an even

flow of air with high external pressure. Günaydin thus achieve fast freezing processes for large quantities of heat, and preserve not only the appetising appearance of fruit and vegetables, but also their taste and nutritional value. For long-term storage, three type GHN066 C/112 unit coolers with hotgas defrosting have been installed in the deep-freeze room.

Great effort – best results

The teams from Frigotechnik and Kälte-Klima Peters had to face one particular challenge even before the installation of the refrigeration systems at Günaydin: the synchronised transport of all the plant components from three locations in Germany to Alasehir! But this was overcome through close cooperation between Rita Conrad of Frigotechnik, Wülfrath, the German transport and logistics company Barth & Co., and the personal contacts with the Günaydin family in Alasehir and Hamburg. Installation also made the highest demands on the refrigeration specialists who carried it out. Under the management of fitter Michael Doctor, the 16-man team from Kälte-Klima Peters worked an average of 15 hours a day, and had the complete refrigeration equipment ready for operation in only eight weeks. “The effort was worthwhile,” managing Director Christoph Peters smiles. “Together with Frigotechnik, Wülfrath, we will shortly be planning a follow-on project for Günaydin.”

The system saves energy through:

- Hot-gas defrosting as required
- Heat exchangers selected for the precise cooling power required
- Systematic optimisation and adaptation of all system components



Mr. Vahdy Günaydin banks on highest quality with the Guntner series. With their large heat exchang-

er surface, these series are particularly suitable for cooling sensitive products like fruit and vegetables.

This is important for fruit and vegetable refrigeration:

- Right temperature level between +1 and +4 °C with a relative humidity of 95 %
- Cooling speed of items to be refrigerated
- Heat to be removed per tonne of goods stored, e.g. apples:
 - Cooling phase 235 W
 - Storage phase 8 W
 - Heat removal per tonne 0.9 %
- Temperature-stable storage
- Maintenance of quality through reduced transpiration
- Use of modern technologies, e.g.:
 - Guntner evaporators
 - Mech./electrical injection valves
 - Siemens SPC controls
 - Optimised energy consumption

Source: C.-Dieter Penno, Frigotechnik Handels GmbH, Wülfrath, Germany

Europe-wide: Wholesale and system planning for refrigeration and air conditioning equipment

Frigotechnik Handels GmbH is one of the leading wholesale companies in Germany and Europe in the refrigeration and air conditioning sector. The company combines trading and service functions on top of a solid, established company structure. Frigotechnik's range of products combines tried products from national and international manufacturers for the entire refrigeration and air-conditioning sector. In addition to sustained high, innovative product quality, the wholesaler's quality standards include long-term availability of the solutions, including accessories and replacement parts. Where necessary, the supplier manufactures complete system solutions in his own workshops. Cooperation with experienced partners in manufacturing and allied trades ensures that the solutions are professional and at the latest state of technology. The offering of



Frigotechnik is rounded off by a comprehensive range of services, from personal consulting through storekeeping, delivery and collection services, to construction-site services.