Shared Fresh Distribution Centre in The Netherlands

100 000L of Temper-20

Ammonia and Temper-20 in large-scale indirect cooling system using efficient brine for defrost

To secure the quality of fresh products in an unbroken cold chain is one of the cornerstones in food chain logistics. One of the biggest producers of fresh fruit and vegetables in Europe is The Netherlands. They demand an energy-efficient and environmental safe storing of fresh products. Temper as HTF and NH_3 as primary refrigerant in refrigerant systems is a popular choice.

Fresh pack centre in Holland

One of the main supermarket chains in Holland has together with a logistic company built this over 40 000 m^2 large fresh pack centre. The construction company Pleijsier Bouw first contacted Voets & Donkers in January 2014 looking for a solution to maintain air temperature at the Shared Fresh Centre within a constant range of 0°C to 2°C. Considering the gigantic daily handling in the distribution centre, this is not an easy task. Besides effective, the refrigeration needed to be efficient and (therefore) sustainable.

Voets & Donkers took on the hugh project and realized by using ammonia as primary refrigerant and Temper as heat transfer fluid together with EC-ventilators regulated by variable speed. →

Propylene Glycol vs Temper, where Temper was chosen due to

- Lower energy consumption
- Pipeline/insulation dimension
- Better heat conductivity in coolers
- Long term solution

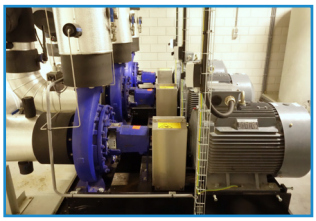
Installation facts

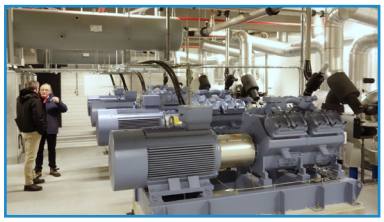
Cooling capacity	2,8 MW
Installed	2015
Total surface	40 000 m^2
Overall dimension	250*140*14 m
Storage	Packed and unpacked Fresh products, distribution Dutch supermarkets
Cooling system	Temper-20/NH_3 system
Defrost system	Indirect with using condensing heat
Primary refrigerant	NH_3 2x495 kg
Heat transfer fluid	Temper-20, 100 000 L
Temperature	Between 0-2°C
Liquid temperature In/out	-7/-3°C
Pipe structure	Approx. 9 km Stainless steel
Energy consumption	In accordance with Dutch energy list
BREEAM Qualification	Very Good

Temper®

the ideal Heat Transfer Fluid

Due to this sustainable solution pre-packed fresh food from local producers can be kept at 0°C to +2°C, and distributed to local supermarkets. To keep the pre-packed fresh food at this specific temperature was a job that Voets & Donkers took up with great pleasure and completed in August 2015.





Temper the ideal choice of a HTF

Temper is a top of the line environmentally friendly heat transfer fluid used in a wide range of refrigeration applications. The ready-mixed and non-toxic organic salt solution is combined with an effective corrosion inhibitor package making Temper readily biodegradable. The remarkable thermal properties make Temper an excellent choice for a wide range of refrigeration applications, especially in industrial- and in food refrigeration industry.

Temper is suitable for medium- as well as low temperature refrigeration systems and is efficiently used at temperatures between as low as -60°C up to 180°C in pressurized systems. The product is available in seven different versions from -10°C down to -60°C.

General Properties

Appearance	Colourless to pale yellowish
Boiling point	Approx. 109°C
pH	8-9

Advantages with Temper

- Low viscosity
- High thermal conductivity
- Reduced energy cost
- Readily biodegradable
- Adapted for the food industry
- Advanced inhibitor technology
- Personalized technical support

Thermophysical Properties

	Unit	T-10	T-15	T-20	T-30	T-40	T-55	T-60
Freezing point	°C	-10	-15	-20	-30	-40	-55	-60
Density	kg/m³	1089	1114	1142	1177	1207	1240	1260
Specific heat	KJ/kg • K	3,577	3,446	3,315	3,124	3,008	2,817	2,820
Thermal conductivity	W/m • K	0,544	0,526	0,508	0,486	0,465	0,441	0,440
Dynamic viscosity	mPa • s	1,45	1,63	1,80	2,10	2,71	4,06	4,28
Kinematic viscosity	mm²/s	1,33	1,46	1,58	1,78	2,25	3,27	3,40

Measurements are performed @ +20 °C

About Temper Technology

Since 1996 the Swedish company Temper Technology manufactures the non-toxic and energy efficient Heat Transfer Fluid; Temper. Temper is mainly used in larger food industry applications and logistic centres. To ensure the high quality Temper is always delivered ready-to-use and can be used down to -60°C

temper technology

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