ago congelö
When hot turns to cold

Efficient energy supply –
from small plants to industrial large-scale plants
Economic conditions for industrial and agricultural cooling energy generation have changed considerably over the past years. As electricity tariffs are rising constantly but heat is available from decentralized power generation, absorption chillers which use heat instead of electricity, in many cases may economically be more favourable than conventional reciprocating compression chillers.

The ammonia/water absorption chiller named “ago congro” generates cooling energy up to a coolant outlet temperature of -28 °C. For this, the chiller primarily requires heat which is generated during the client’s industrial processes or during a CHP plant’s or gas turbine’s power generation. This heat mostly cannot be used otherwise. Compared to reciprocating compression chillers, this system’s electricity demand is only marginal.
minus

28° Celsius

Hot can be this cold. Thanks to ago.

ago congeló
proven technology
for numerous industrial sectors

Food and beverage industry
Fruit and vegetable storage
Deep freeze and cold storage
Breweries
Chemical industry
Dairy industry
Baking industry
RELIABLE, PROFESSIONAL, BEST QUALITY. THAT’S MY EXPERIENCE WITH AGO.

Jeff Maisel
Gebrüder Maisel Brewery
How does an absorption chiller work? It’s simple. With our assistance.

In the refrigeration technology, the term “sorption” is understood as the ability of a substance to attach gaseous substances to itself. It must be distinguished between absorption and adsorption. In case of adsorption, the gaseous refrigerant is adhered to a solid. The ago congelò however uses the physical process of absorption where a fluid medium – in this case water – absorbs the vaporized refrigerant. This process is exothermic which means that energy is released in the form of heat. The absorber consequently must be cooled down in order to work efficiently. As the gaseous refrigerant is now dissolved in the water and is therefore no longer compressible it can easily be conveyed to the higher pressure level of the chiller with just a small amount of electric energy. The electric power consumption of an absorption chiller is only about 3 – 8 % of the refrigerating capacity. Once the water/ammonia mixture has been brought to the high pressure level it is preheated by internal heat recovery. Afterwards, in the generator it is charged with the actual operating energy in the form of thermal heat (waste heat from processes or CHPs). The ammonia is now boiled out of the water, similar to distillation. In the rectification column, the mixture is separated further and the pure ammonia vapour is leaving the pressure valve towards the condenser. From here, the process again resembles that of a conventional chiller. The refrigerant (ammonia) is liquified, subcooled and relieved to evaporating pressure by an expansion valve. In the evaporator it absorbs the heat from the coolant and evaporates in doing so. This closes the circle and the ammonia again flows to the absorber which „sucks“ the gas instead of a conventional reciprocating compressor.
This is how you can reduce your operating costs and additionally contribute to saving the environment:

- Reduction of operating costs by using waste heat as engine.
- Reduction of electric power input.
- Low maintenance and repair costs.
- Long durability, high reliability.
- Increase of energy efficiency through trigeneration compared to separate cooling generation.
- Use of a natural refrigerant with long-term availability.
- No chemicals are added (just pure ammonia and distilled water).
- Subsidized by government.
One step ahead . 07

Why is our technology more advanced than others?

Advantages over reciprocating compression chillers
Lower electric power input, only about 3 – 8 % of the refrigerating capacity
Lower susceptibility to failures due to simple design
No risk of hydrolocks

Advantages over water/lithium bromide absorption chillers
Coolant outlet temperatures of under + 4 to – 28°C possible
No risk of crystallization of the solvent

THE TRIGENERATION PLANT SUPPLING ELECTRICITY, STEAM AND COOLING IS FOR US THE MOST ECONOMIC SOLUTION.

Karl Klein
Gropper GmbH & Co. KG Dairy

ago congeolo at a glance

Capacities
Refrigerating capacity per module of 50 to approx. 1000 kW
Coolant outlet temperatures of + 4 to – 28°C
In terms of temperatures and capacity the plants are designed at customer’s needs.

Design
Modular design
Compact design by using plate heat exchangers
Simple integration into existing refrigeration systems
Continuous adjustment and design at customer’s needs
Compact outdoors installation possible, e.g. cooling tower right on top of the absorption chiller

Usable heat sources
Waste heat from CHPs
Industrial waste heat in the form of water, vapor or thermal oil
Waste heat from post combustion processes

One step ahead . 07
Economical, ecological, no compromise

Heat ratio when using waste heat from a CHP

Optimum heating medium temperature for maximum heat ratio

We are pleased to design your plant adjusted to your parameters.

Heat ratio = refrigerating capacity / heat output
Refrigerating capacity = heat ratio x heat output
Heat output = refrigerating capacity / heat ratio
Examples of how the ago congelo can be integrated

Example 1 and 2
Direct integration on the liquid separator for normal cooling of a pump driven cooling plant or cascade system for low temperatures

Example 3
Cooling energy transfer into an existing refrigeration cycle e.g. water/glycol
ago congeo
The solution for your cogeneration project

We have pleasure in estimating the profitability of our plant for your special application

For our design we require the following parameters:

Available waste heat capacity or required refrigerating capacity

Heating temperature: supply and return

Refrigerant outlet temperature

Place of installation and wet bulb design temperature or cooling water temperatures

Contact us at congeo@ago.ag or +49 9221 602-0
A BIOGAS PLANT WAS ONLY AN OPTION FOR ME WITH FULL HEAT USAGE. TOGETHER WITH AGO I COULD IMPLEMENT A SUSTAINABLE ENERGY CONCEPT.

Till-Erik Meyer, Farmer
Your efficiency is our expertise

Since 1980 our company has been focused on efficient energy supply facilities for industrial customers and municipalities. In addition to plant development and implementation, we also offer service and consulting.

Thus, the name AGO has long become a synonym for efficiency, reliability and technological competence regarding engineering and construction of heating, cooling and ventilation plants, biomass cogeneration plants, combined heat and power plants and trigeneration plants.