GLACIEM
COOLING TECHNOLOGIES

CO2LDCARBON

CO_2 Refrigeration Systems

Glaciem Cooling Technologies

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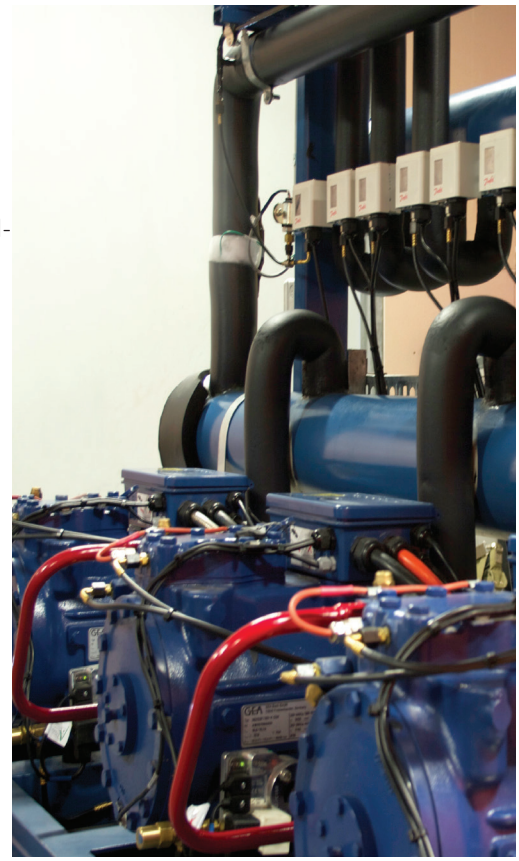
Innovative Natural Solutions

Why CO_2

Increased environmental concerns over global warming has lead to significant political pressure in the use of high Global Warming Potential HFC refrigerants, with legalization been passed in Europe and the USA that will see the phase down/out of todays most commonly used HFC refrigerants.

This will have a major impact in the use of HFC refrigerants.
CO_2 (R744) offers significant advantages over synthetic refrigerants especially in low temperature refrigeration applications.

- Energy efficient particularly in low temperature application
- Natural refrigerant with low environmental impact GWP=1 ODP=0
- Attractive life cycle cost
- Low cost refrigerant



CO2LDCARBON

With a focus on Innovative Natural Solutions Glaciem Cooling Technologies has developed the CO2LDCARBON range of cascade CO_2 racks. CO_2 Cascade systems are a reliable and efficient technology particularly in countries with warmer climates

The unique, robust design features make CO2LDCARBON cascade racks ideally suited for commercial and industrial low temperature applications.

Features

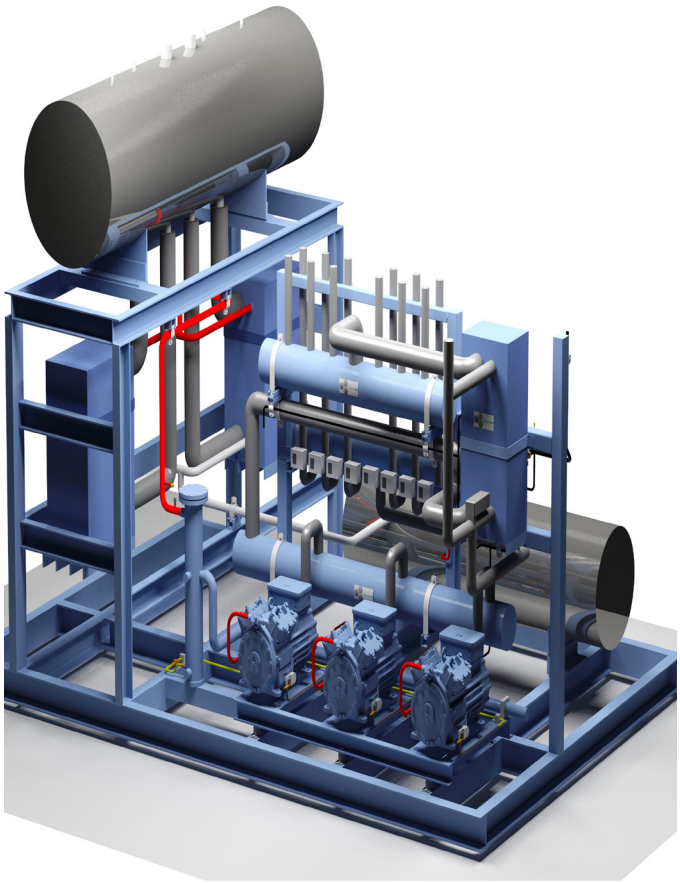
- Flooded Brazed Plate Heat Exchanger (BPHE) CO_2 condenser ensures stable condensing , easy commissioning, reduced risk of BPHE failure and eliminates the need for CO_2 air cooled de-superheater.
- Stainless steel CO_2 liquid receiver; eliminates the risk of vessel fatigue / fracture in the event of dry ice formation compared to standard carbon steel vessels.
- All vessels manufactured to AS1210 standard.
- GEA Bock HGXe high quality and robust supercritical CO_2 compressors.
- Temprite coalesce oil separators.
- Trax oil management system.
- Stainless steel discharge and condensate lines.
- High quality valves and components.

CO2LDCARBON Cascade Combinations

Recent studies indicate that R744 cascade systems offer significant benefits over traditional HFC and 2 stage pumped Ammonia systems.
Although traditional 2 stage pumped Ammonia systems are extremely efficient they do have significant drawbacks such as;

- Ammonia circulating through occupied spaces.
- Large refrigerants charges .
- High installation cost.
- Low temperature part of the system operating in a vacuum.

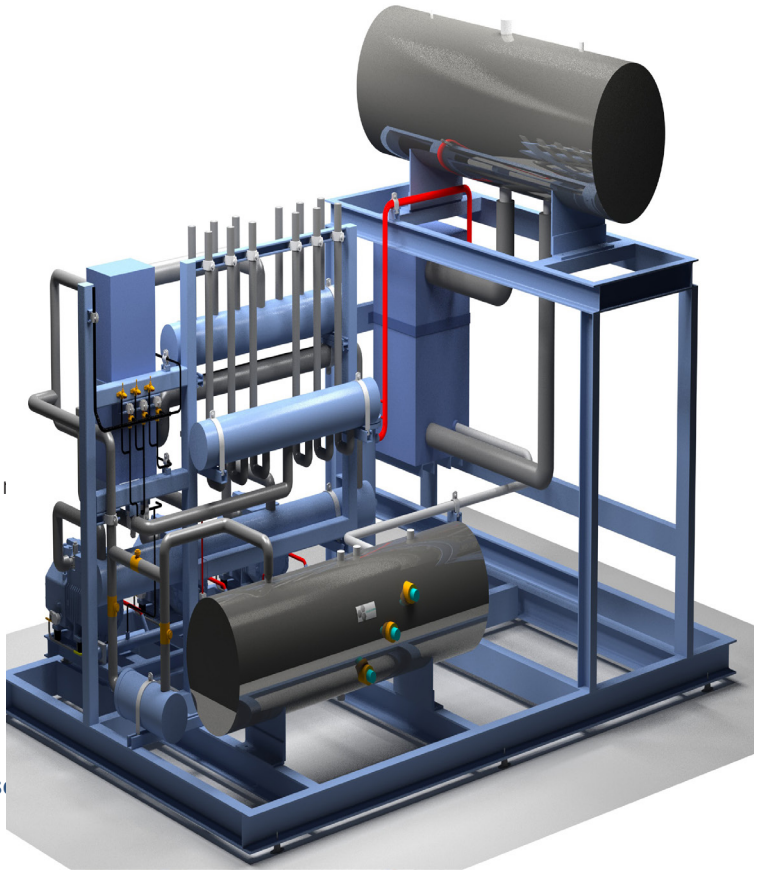
Combining the benefits of Ammonia with CO_2 as the high stage in cascade eliminates the issues highlighted above by restricting the ammonia to the plantroom area.



CO_2/NH_3 cascade

For clients looking for greener and more efficient secondary system, a carbon dioxide (CO_2)/ammonia (NH_3) cascade system is a viable option. In addition to providing zero ozone depletion potential (ODP) and a global warming potential (GWP) of 1.
CO_2/NH_3 cascade systems offer several benefits for food processing and low-temp distribution facilities including:

- **Better Internal Rate of Return (IRR)**
- **Increased Net Present Value (NPV)**
- **Low operating costs.**
- **Low capital costs.**
- **Ammonia charge reduction.**
- **Reduced compliance costs.**
- **Constant positive pressure.**
- **Product quality and throughput improvements.**



CO_2/HFC cascade

CO2LDCARBON racks can be used with a variety of HFC cascade high stage refrigerants.

Their design makes them ideally suited for CO_2/ R134a Hybrid systems. Hybrid systems are an extremely attractive alternative option to traditional R404A systems, mai benefits are:

- **Low environmental impact, 20% reduction in energy consumption 65%reduction in CO_2e when compared to traditional R404A installations.**
- **Low operating costs.**
- **Limited exposure to any future restrictions on the us of HFC refrigerants.**

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