



NH_3 / CO_2 Refrigeration System
Sales Brochure



About Heatcraft Worldwide Refrigeration

Heatcraft Worldwide Refrigeration has been creating solutions with customers for over 125 years. Built on a tradition of excellence, we are proud of our commercial and industrial refrigeration products and services, and our commitment to our customers. Heatcraft creates solutions that help customers achieve their goals for sustainability and profitability, while competing in today's changing commercial and industrial refrigeration environment.

We provide unparalleled customer service and are on the leading edge of technology in the manufacture of evaporators, condensers, condensing units, and mechanical refrigeration systems.

Our core values, building relationships and creating quality solutions for our customers, are fundamental to our success. These values define who we are and set us apart from our competition.

NH₃/CO₂ Cascade Refrigeration System

Heatcraft's NH₃/CO₂ cascade refrigeration system provides the ultimate solution for sustainable refrigeration. This system provides an HFC-free refrigeration solution while providing significant lifecycle cost savings for refrigerated warehouse and food processing facilities.

System Benefits:

- Completely HFC-free system (uses only NH₃ and CO₂)
- Naturally occurring refrigerants
 - CO₂ ozone depletion potential (ODP) of 0 & global warming potential (GWP) of 1
 - NH₃ ozone depletion potential (ODP) of 0 & global warming potential (GWP) of 0
 - For comparison, R-404A (common HFC refrigerant) has GWP of approximately 3800
- NH₃ and CO₂ are both very well established refrigerants
- Most energy efficient refrigeration system design available
- NH₃ charge of only 1lb per ton of refrigeration vs typical industry charge of 4 lbs per ton of refrigeration.

Heatcraft Advantages:

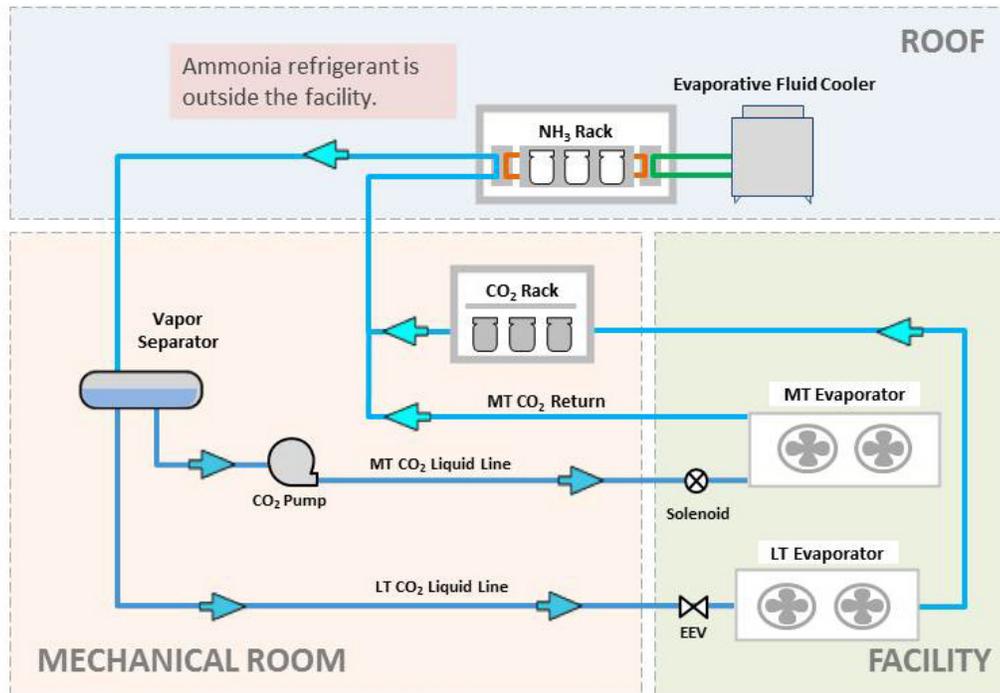
- Commitment to innovation and quality
- Proven history with CO₂ cascade and liquid overfeed systems
- Extensive qualification and testing protocols



Typical Performance VS Traditional HFC System

	TRADITIONAL HFC	NH ₃ /CO ₂
GLOBAL WARMING IMPACT	Baseline	↓99%
ENERGY COST	Baseline	↓15% - 23%

System Layout



System Operation

Heatcraft's transcritical CO₂ refrigeration system is completely HFC-free and designed to provide superior performance for refrigerated warehousing and food processing applications.

Liquid carbon dioxide is distributed throughout the facility to provide cooling to each refrigerated space. Medium temperature evaporators are supplied with carbon dioxide (CO₂) refrigerant by a liquid overfeed pump. Low temperature evaporators are serviced by a cascade vapor compression cycle to enable the evaporators to operate at the appropriate temperatures. Upon leaving the evaporators, the CO₂ refrigerant is taken to the primary ammonia (NH₃) cooling system. The CO₂ is then chilled by the primary NH₃ system via a brazed plate heat exchanger (BPHX) inside the NH₃ system enclosure.

In the NH₃ portion of the system, the ammonia is completely contained within a mechanical enclosure. No ammonia is found outside this self-contained package. Heat is rejected to an evaporative water/glycol cooler to obtain very high levels of efficiency. It also ensures that NH₃ refrigerant does not leave the enclosure. This design allows the NH₃ to be substantially reduced—thus allowing the system to fall below regulatory thresholds for enhanced monitoring or reporting.

Design

STANDARD FEATURES	OPTIONS
<ul style="list-style-type: none"> Evaporative fluid cooler Leak detection and purge ventilation Automatic oil recovery Self-contained NH₃ rack package 	<ul style="list-style-type: none"> Ammonia diffusion system Emergency pressure control system Heat reclaim



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