



Air Management Technologies, Inc.

Building Energy & Environmental Services
www.airmanagement.com

INDUSTRIAL CASCADE REFRIGERATION SYSTEMS



Chemical vs. Natural Refrigerant Debate

Rapidly changing environmental regulations have caused the industry to struggle when evaluating the choice between chemical or natural refrigerants in process cooling applications. In response to these mandates and increasing corporate environmental initiatives food processing facilities have seen a surge in use of natural based and newer HFC chemical refrigerants which contain no ozone depletion potential. A new initiative being proposed by the EPA and already adopted in many European countries is elimination of the "newer" HFC refrigerants citing a high global warming potential. Global warming potential is a relative measure of how much heat a "greenhouse gas" traps in the atmosphere and has a value assigned based on equivalent amount of global warming potential in comparison with carbon dioxide.

Technological advancements to make natural refrigerants more efficient and also ease ammonia safety concerns include introduction of cascade systems which use carbon dioxide as a secondary refrigerant and HFC or ammonia as the primary lowering total inventory requirements. Commonplace in regions with strict global warming potential regulations such as Europe, equipment manufacturers are now bringing these products to western hemisphere markets.

Food Based Engineering

Our team understands the thermal science of cooling and freezing various products. Our multi-disciplined approach provides an efficient design engineered for product quality, superior operational reliability, ease of maintenance, accessibility for sanitation, environmental considerations, lower energy consumption and excellent life cycle value.





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Cascade Systems "Problem Solved"

Cascade refrigeration systems are used in low temperature freezer applications providing a solution to high global warming potential concerns regardless of chemical or natural refrigerant choice. Systems are designed with a two stage process: a high side that is normally either ammonia or a chemical based refrigerant such as 507 and a low side that is commonly carbon dioxide. Since these refrigerants are separated by a heat exchanger interface the high side refrigerant charge is greatly reduced providing multiple key advantages relating to Health and Safety, Environmental Liability, Maintenance Expense, and Operational Cost.

Designed as part of an intelligent facility refrigeration architecture Cascade systems can serve end uses with versatile temperature requirements ranging from -50F (-45C) to 50F (10C). This is accomplished by connecting the warmer temperature loads directly to the "high side" of the system reserving the "low side" for subfreezing requirements. The subfreezing low temperature requirements can be satisfied without operating compressors in a vacuum mitigating operational risk. Flexibility exists to make decisions on how facility loads may be best distributed with potential to incorporate other heat fluid transfer fluids.



Blast Freezer operating at -20F

The Air Management Technologies team is ready to assist in providing a Guaranteed Solution to your Cascade or Conventional product refrigeration requirements.



About Air Management Technologies

Air Management has delivered building energy, thermal process product conditioning, and environmental solutions for over twenty years. Our written performance guarantee places the responsibility in our hands, and the life cycle cost savings in yours. Every project is guaranteed to be within budget and operate as specified.

Turnkey Design Requirements Development, Engineering, and Construction Available.

