

Advanced Refrigeration Technologies from Hill PHOENIX

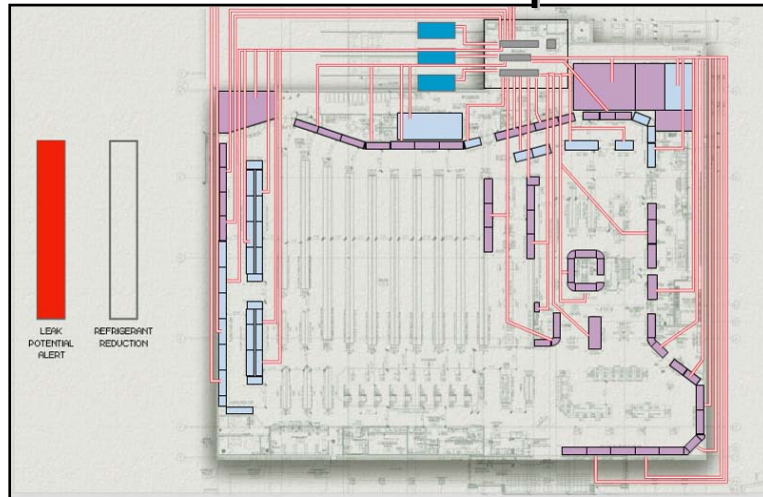


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REFRIGERATION SYSTEMS

Design Impact on Refrigerant Requirements

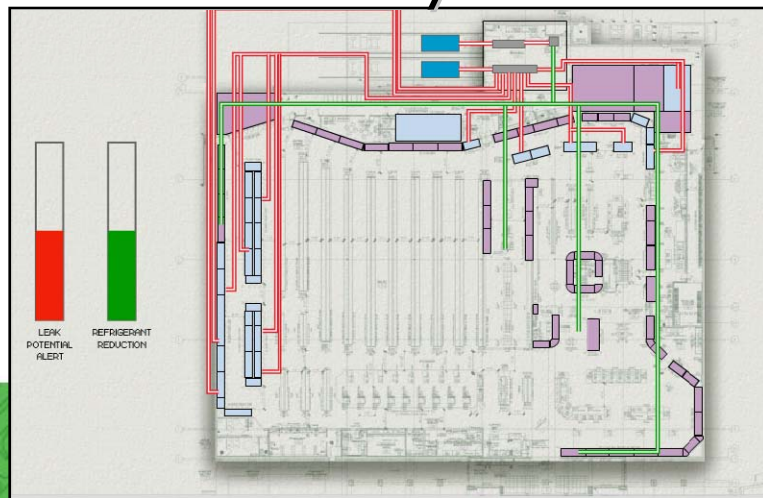
Current Direct Expansion



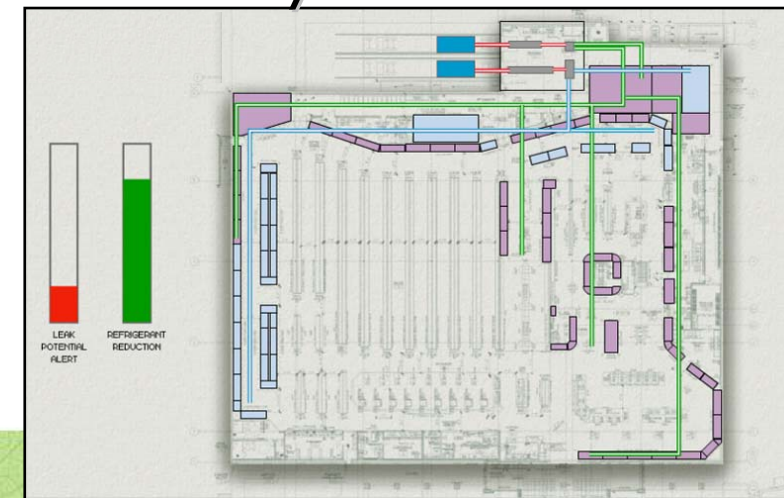
Direct Expansion Distributed



MT Secondary/LT DX



MT Secondary/LT CO2 Secondary



Design Impact on Refrigerant Requirements

Compact Chiller MT and LT



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Distributed Systems

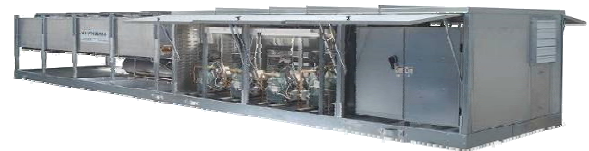
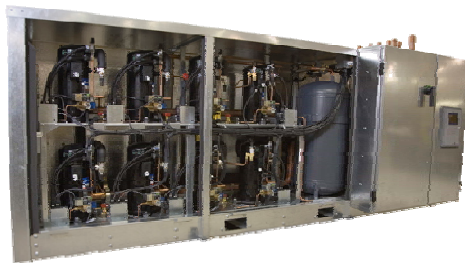
- Locate multiple systems closer to refrigerated loads
- Reductions in copper piping, refrigerant charge, and leak rates



**PARA
TEMP**



**INVIRO
PAC**



**WEATHER
PAC**

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Second Nature MT



- Medium-Temperature Secondary Coolant System
- Circulates propylene glycol in sales area through ABS piping network
- Refrigerant confined to mechanical room
- 60-80% charge reduction
- Up to 90% reduction with modular water-cooled condensers



SNMT
Med Temp
Secondary Systems



SNPS
Medium Temp
Pump Stations

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Second Nature LT Secondary

- Low-Temperature Carbon-Dioxide Secondary Coolant System
- CO₂ pumped through sales area
- Primary refrigerant confined to mech. room
- 60-80% HFC charge reduction
- Up to 90% reduction with modular water-cooled condensers



SNLT2
Low Temp Secondary CO₂

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Second Nature LT CO2 DX Cascade

- Low-Temperature Carbon-Dioxide Direct Expansion Cascade System
- CO2 piping in sales area
- EEVs on evaporators
- Primary refrigerant confined to mechanical room
- 60-80% HFC charge reduction
- Up to 90% reduction with modular water-cooled condensers



SNLTX2

Low Temp
CO₂ Cascade

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Second Nature Compact Chiller

- Secondary Coolant System
- Primary system is modular ultra-low-charge: Less than 120 lbs. for typical MT system
- Reliable scroll compressors close-coupled to heat exchanger
- 95% charge reduction
- Ultra-low leak rate
- Pre-charged from factory



SNPS
Medium Temp
Pump Stations



SNCC
Compact Chiller

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