
AMERICA
ATMO
sphere
business case
natural refrigerants
June 16 & 17, 2016 – Chicago

BROAD U.S.A. INC.

AMERICA ATMOsphere business case

natural refrigerants

June 16 & 17, 2016 – Chicago

Cooling & Heating w/ Modern Absorption R-718 & sub-cooling R-744

Douglas Davis

Director of Channel Sales in North America

Broad USA

201.951.5713 davis@broadusa.com

A ***Natural Way*** to Design or "Redesign" a Supermarket

ATMO sphere AMERICA business case natural refrigerants

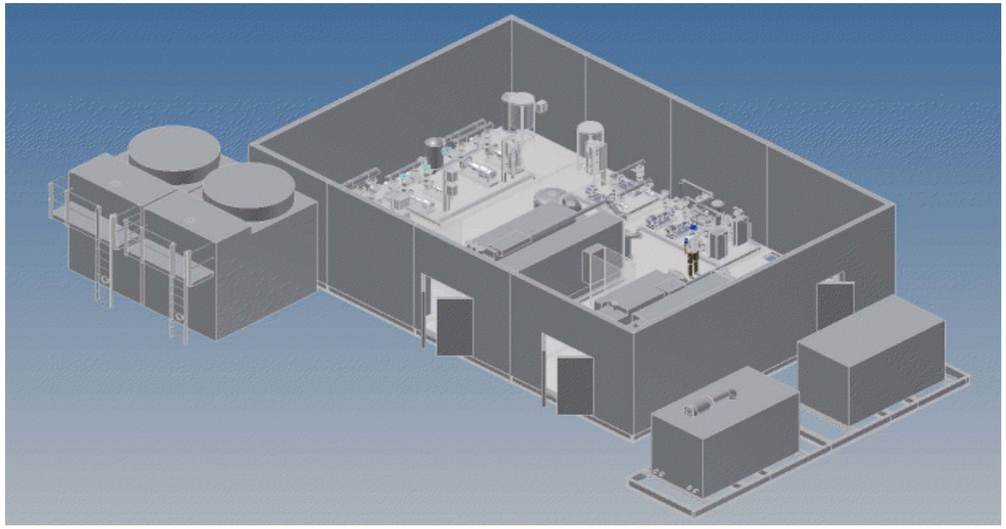
June 16 & 17, 2016 – Chicago

BROAD U.S.A. INC.

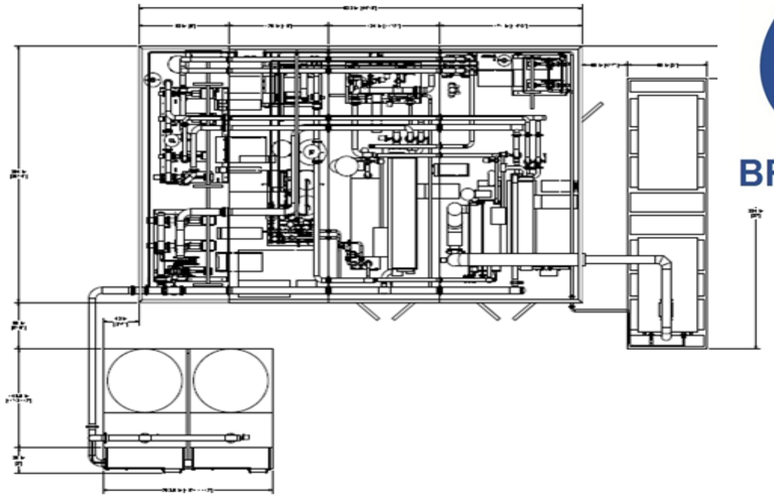
Introduction of Supermarket Design

Owner wanted to build a chemical free resilient flag ship store in NYC, Brooklyn.

- R-718 & 744 was the most practical and efficient choice for the above stated goal
- One year from “Start” to Completion
- NYSERDA incentive for CHP or Cogeneration $2000/kw
- Store can operate with or without the electric grid
- Store can serve community when they need it the most…..superstorm sandy
- Put everything on the roof….resiliency

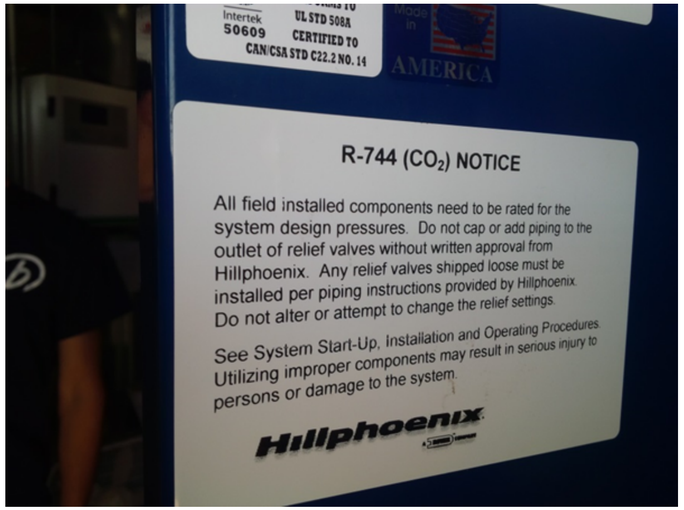


GREEN DESIGN
WHOLE FOODS MARKET
CELEBRATION

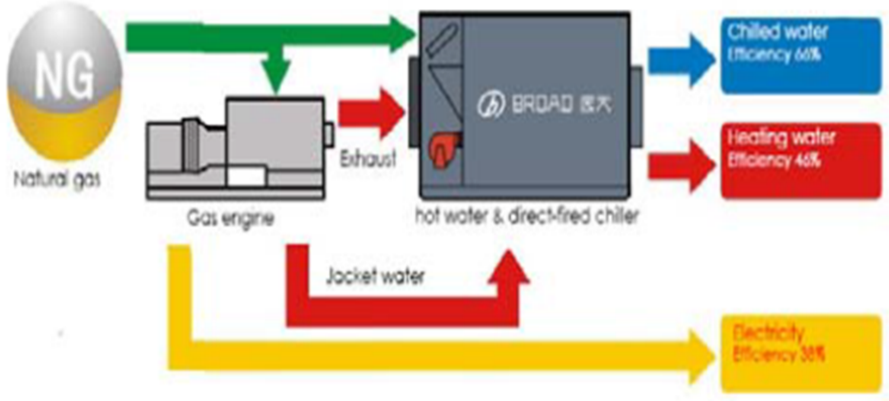


BROAD U.S.A. INC.

BROAD U.S.A. INC.



• BROAD CHP Exhaust & Hot water type

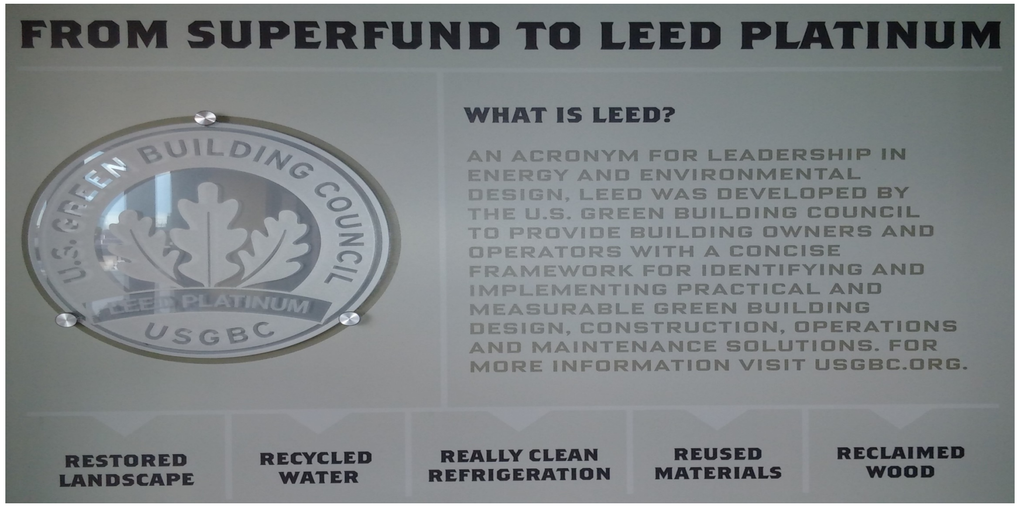


ATMO AMERICA sphere business case natural refrigerants

June 16 & 17, 2016 – Chicago

BROAD U.S.A. INC.

Efficiency & Resiliency Analysis



If you are paying more then 9 cents for electricity Gas Cooling & Heating with Modern Absorption is the most affordable way to provide HVAC a commercial building.

- To really drive down operating cost this store used CHP or Cogeneration and Modern Absorption.
- Measuring efficiency:
- 56,000-square-foot structure is 60 percent more energy efficient than the building code requires. That's right: 60 percent more efficient, making it one of the most energy efficient supermarkets in the nation, Whole Foods says.(source greenbiz.com)

Cost Analysis & System Summary

- 2.5 million for a pre packaged solution
- 300 plus K incentive for Cogen
- (Estimated) price differences to conventional system about 35%
- Lifecycle cost makes the 35% premium a reasonable payback
- Benefits of added resiliency is very attractive especially when one considers loss of revenue and product loss when you loose power.
- Two chiller/ heaters one with cogen input " exhaust jacket water and NG multi energy" for a total of 250 tons of cooling 1.35 COP in Gas cooling and .93 COP in heating mode.
- Two Engines 150 KW of Cogen and 250 KW of "Demand Response".
- Normal HVAC design points for CW 44F Hot water 180 and Domestic supply 140F all variable

Barriers and Solutions

Who wants to be first?

- Technical hurdles and unfamiliarity with Modern Absorbers and rules of thumb regarding COP and application flexibility are not widely known.
- Psychological barriers from history of Older Absorption Technology (last century)
- Safety problems….. it is common use for domestically sources fuel…Natural Gas
- Higher capital cost is re-cooped due to lower operating cost.

Lessons learnt and Low Temperature Rack Integration Photos Foodtown

It works and it is not risky with the right supporting partners and pre-packaged approach.

- What will you do differently in the future? Not drive through the state of Delaware with police escorts.
- What can you apply to the next projects? Right sizing never oversize!!!

Future plans

- Foodtown coming on line this month
- We need to create and do a better job of sharing success stories so others can follow.

BROAD U.S.A. INC.

Action Plan

1. Continue out reach and education

- Update to follow on an existing building supermarket conversion to R718 at a Foodtown.

2. Look for other vertical “markets leaders” who want to follow Supermarkets regarding natural refrigerants.
Photos are a new process cooling project for a global pharmaceutical based in NJ using both CO2 and Absorption

AMERICA

ATMOsphere

business case

natural refrigerants

June 16 & 17, 2016 – Chicago

Thank you very much!