



Best Practices in Commerical Refrigeration

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UNIVERSITY OF MINNESOTA
Driven to DiscoverSM

Company Background

South Town Refrigeration

- Brooklyn Park, 65 Employees, 30,000 Square Ft. Office + Inventory
- Custom installation and maintenance of refrigeration and HVAC systems
- Minneapolis and throughout MN



Incentives

South-Town

REFRIGERATION & MECHANICAL

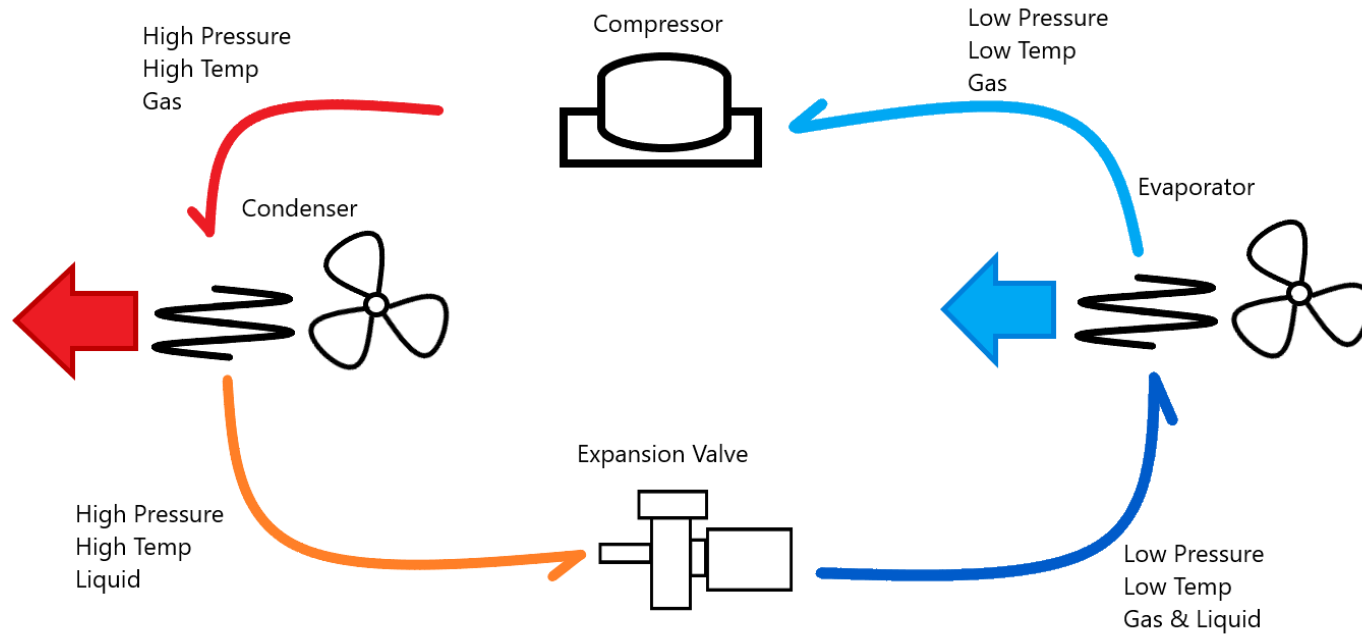


- Reduce emergency service demand
- Improve customer knowledge

- Reduce energy costs
 - 58% of grocery store electricity usage is refrigeration
 - Grocery stores consume 9% of the total electricity for all commercial buildings
- Minimize expensive refrigerant leaks

- Reduce refrigerant emissions
 - Refrigerants are potent greenhouse gasses
 - Some refrigerants deplete ozone layer
 - 6.8% of service calls had a refrigerant leak
- Save energy

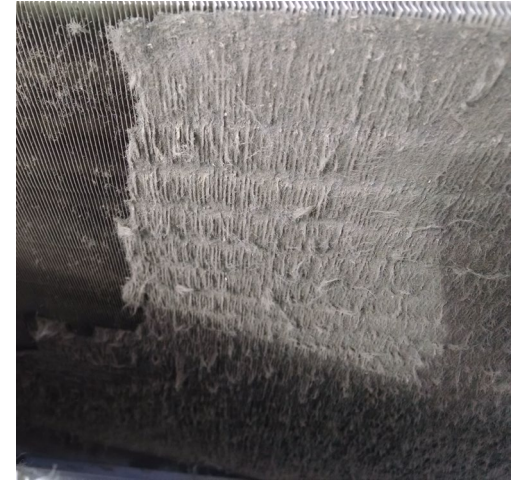
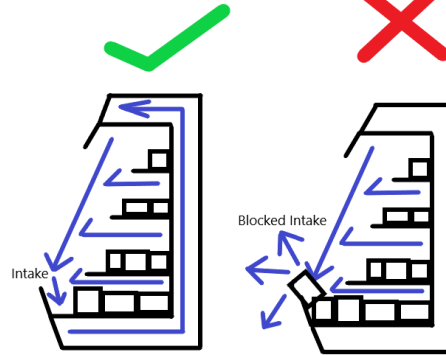
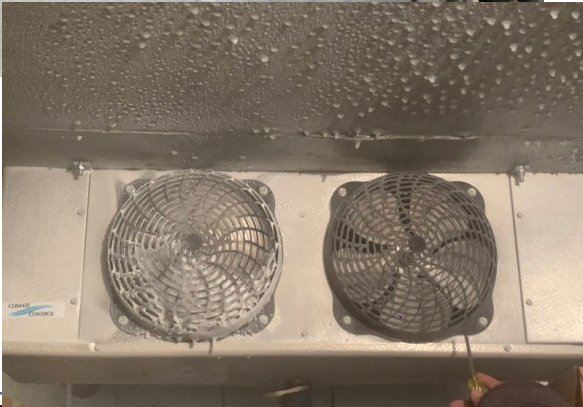
Refrigeration Cycle



- Provides information on components and common issues of refrigeration systems
- Targets smaller scale grocery store owner/operators
 - Implemented at 8 stores
- Includes monitoring checklist for monthly observation
- Goals:
 - Reduce leakage and time to discover
 - Prevent catastrophic failure
 - Improve running efficiency



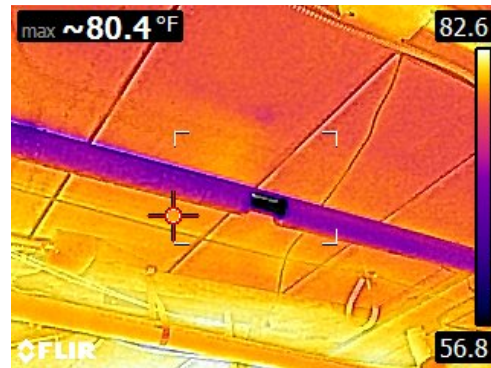
Recommendations



Borchert's Meat Market

Maplewood, MN

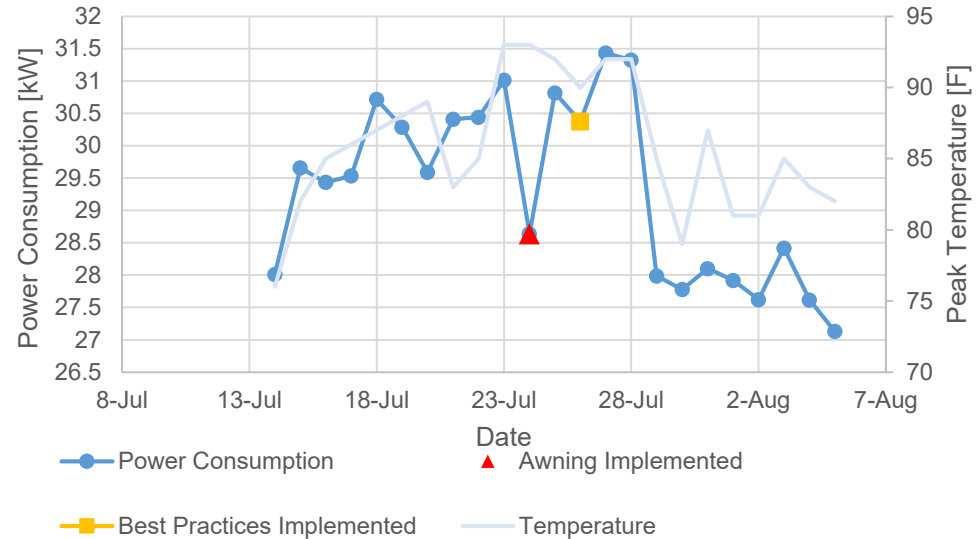
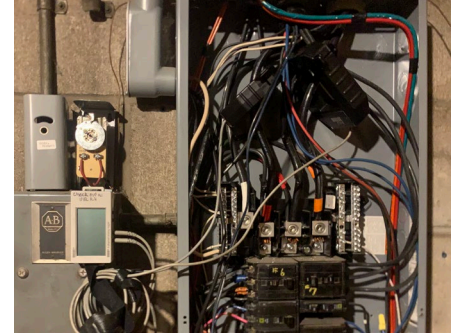
- Repair insulation of refrigerant piping
 - Sub-contracted estimate \$18,000
 - In-house estimate \$6,300
- Improve Condensing Unit Conditions
 - Sprayers and shade added in house



Data Collection

- Two current transducers set up to measure electricity usage in the store
- Overall power usage can be calculated from current measurement
 - 718 kWh/day before
 - 685 kWh/day after

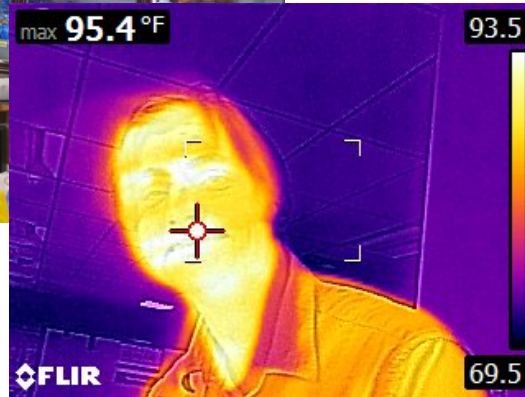
Borchert's Energy Monitoring



Solutions

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
Observe Best Practices	8,000 kWh - 22,500 kWh	<\$30 per month	\$700 - \$2,000	Immediate	Implemented at 8 Stores
Borchert's: Reinsulate In-House	38,500 kWh	\$4,760 Mats. \$1,500 Labor \$6,260 Total	\$3,400	1.86 Years	Recommended, Currently Purchasing Materials
Borchert's: Condensing Unit Shade and Sprayers	12,100 kWh	\$640	\$1,100	0.6 Years	Implemented

Personal Benefits



- Small office experience
- Refrigeration industry exposure
- Engineering contractor experience
- Improved Professional Skills by self advocating and explaining project