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ENERGY EFFICIENCY EXPERTS

Carbon Fiber Fan Blade Measurement & Evaluation Testing

Industry: Big Y Supermarkets (Walk-in Refrigeration)

Big Y is one of the largest independently owned supermarket chains in New England, and operates 73 supermarkets in Massachusetts and Connecticut

2015

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WHY CARBON FIBER BLADE TECHNOLOGY ?

FridgeWize Inc. designed and manufacture carbon fiber blades with the aim of delivering quantifiable energy reduction and overall improvement of refrigeration systems.

PERFECTLY BALANCES THE MOTOR

RETAINS ITS SHAPE

STONGER

LIGHTER

RELIABLE

WILL NOT RUST TO THE SHAFT

QUIETER

AIRFLOW NOT COMPROMISED

DESTRESSED THE MOTOR

WINNER OF GLOBAL AWARDS

MADE IN USA

MEASURED ENERGY SAVINGS

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FIELD TESTING

Field testing was carried out by Big Y Market engineers and facility technicians

OUTLINE OF TEST

- Testings of evaporators to show amp reduction on the existing EC motors by replacing the old aluminum fan blades with new **FridgeWize Q-12 fan blades**
- Real-time Amp draw was documented by using a multimeter to show actual amp draw on all evaporators
- Pictures were taken and readings documented at each phase by the engineers and facilities technicians working for the “National Grocery Store”

FIELD NOTES

- Existing motors were Morrill EC motors
- All motors were 1/15hp and 208/230v
- Some rusting had occurred on the existing shafts causing some issues when removing existing blades
- Engineer used his own equipment to verify the readings and documented all readings with pictures

EQUATION

Amps x Volts = Watts
Watts x 8760 (hours in a year) / 1000 = KWH
KWH x electrical rate charge = cost

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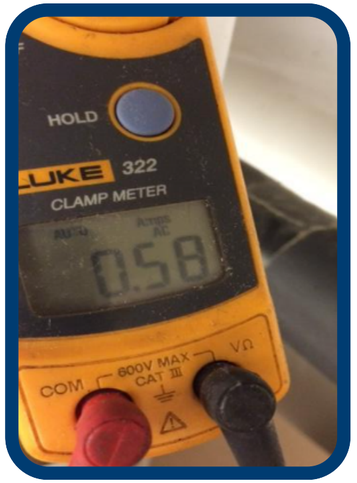
COOLER #1
EVAPORATOR #1



3 x EC motors with old aluminum blades amp draw 0.58 amps

0.58 (amp) x 208 (volts) = 120.64 (watts)
120.64 (watts) x 8760/1000 = 1056.80 (KWH)
1056.80 (KWH) x 0.14 (cents per KWH)= $147.95

Cost to run existing EC motors for one year with **old blades** = $147.95

56%

3 x EC motors with new Carbon Fiber blades amp draw 0.25 amps

0.25 (amp) x 208 (volts) =52 (watts)
52 (watts) x 8760/1000 = 455.52 (KWH)
455.52 (KWH) x 0.14 (cents per KWH) = $63.77

Cost to run existing EC motors for one year with **new Q-12 blades** = $63.77

Total savings
$147.95 – $63.77 = $84.18 (on one evaporator)

0.58 amps to 0.25 amps is a **56% reduction** in Amp pull on the EC motors by implementing the new Carbon Fiber blades

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COOLER #2
EVAPORATOR #1

3 x EC motors with old aluminum blades amp draw 0.74 amps

0.74 (amp) x 208 (volts) = 153.92 (watts)
153.92 (watts) x 8760/1000 = 1348.33 (KWH)
1348.33 (KWH) x 0.14 (cents per KWH)= $188.76

Cost to run existing EC motors for one year with **old blades** = $188.76

⬇64%

3 x EC motors with new Carbon Fiber blades amp draw 0.26 amps

0.26 (amp) x 208 (volts) =54.08 (watts)
54.08 (watts) x 8760/1000 = 473.74 (KWH)
473.74 (KWH) x 0.14 (cents per KWH) = $66.32

Cost to run existing EC motors for one year with new Q-12 blades = $66.32

Total savings
$188.76 – $66.32 = $122.44 (on one evaporator)

0.74 amps to 0.26 amps is a **64% reduction** in Amp pull on the EC motors by implementing the new Carbon Fiber blades

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FREEZER #1
EVAPORATOR #1

3 x EC motors with old aluminum blades amp draw 0.65 amps

0.65 (amp) x 208 (volts) = 135.20 (watts)
135.20 (watts) x 8760/1000 = 1184.35 (KWH)
1184.35 (KWH) x 0.14(cents per KWH)= **$165.80**

Cost to run existing EC motors for one year with old blades = **$165.80**

61%

3 x EC motors with new Carbon Fiber blades amp draw 0.25 amps

0.25 (amp) x 208 (volts) =52 (watts)
52 (watts) x 8760/1000 = 455.52 (KWH)
455.52 (KWH) x 0.14 (cents per KWH) = **$63.77**

Cost to run existing EC motors for one year with new Q-12 blades = **$63.77**

Total savings
$165.80 – $63.77 = $102.03 (on one evaporator)

0.65 amps to 0.25 amps is a **61% reduction** in Amp pull on the EC motors by implementing the new Carbon Fiber blades

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FIELD RESULTS

FridgeWize was able to verify a significant reduction in amp draw by implementing the FridgeWize Q12 Carbon Fiber Fan Blades.

CONCLUSION

- The most prevalent result that can be seen from the test is that the initial amp draws on existing EC motors varied substantially. Once the new blades are installed the motors are balanced completely allowing for the maximum energy savings
- Noticeable during the installation was that some old fan blades were rusted onto the shafts and had to be removed by sanding the shaft. The new FridgeWize blades will never rust to the shaft.
- Engineer commented on the fact that the new blades were considerably quieter than the old blades allowing for a better work environment.

FIELD NOTES

- The reason that the amp draws differ on the initial reading with similar motors (3 1/15hp 208/230v) is simply that the **existing blades are unbalanced** or bent over time. This in turn creates the unbalancing and increased amp draw on the EC motor. The new Carbon Fiber blades **perfectly balance the motors** and will never lose their shape always allowing for the optimal energy savings and the least amount of stress on the motors.

RESULTS

Old Aluminum Blades

Cooler #1: 0.58 amps
Cooler #2: 0.74 amps
Freezer #1: 0.65 amps

New Carbon Fiber Blades

Cooler #1: 0.25 amps
Cooler #2: 0.26 amps
Freezer #1: 0.25 amps

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