

Copeland Scroll® K5 Refrigeration Compressor eliminates issues at meat processing facility

After the failure of a competitor's scroll compressor at a Canadian meat processing facility, a seasoned contractor teamed with Emerson Climate Technologies to resolve the issue. After diagnosing the problem as excessive oil carryover, a year-long field trial of the new Copeland Scroll K5 Refrigeration Compressor proved to be the solution and more.

Application

Refrigeration system at a meat processing plant

Customer

Oxford Energy Solutions (OES), a leading commercial, industrial and agricultural HVACR service company located in Ontario, Canada. The end user is a mid-sized meat processor, also located in Ontario, handling 60 to 85 cattle a day.

Challenge

Successfully processing a large number of beef cattle on a daily basis demands a reliable and efficient refrigeration system. The meat processor had been using another brand of scroll compressor in its primary meat chiller to quickly bring down the temperature of the processed beef to safe storage levels.

After an untimely failure of the primary compressor threatened to shut down the operation, OES was called in to assess the problem. After investigating, OES determined the cause of the failure to be excessive oil carryover during pump down. The company found that the compressor had experienced accelerated bearing wear as a direct result of the large volume of oil being repeatedly carried out of the sump. The premature bearing wear eventually led to the failure of the compressor, requiring its replacement.



“The new Copeland Scroll compressor is a much improved design over that of the competitor's compressor it replaced. There is no comparison, especially in regards to oil retention and its quiet operation. This will without a doubt be our scroll of choice going forward.”

Ben Kungl, Oxford Energy
Woodstock, Ontario

In addition to the bearing failure, OES was also already aware that:

- During periods of high load, a secondary, reciprocating compressor was brought online to meet the cooling demand. The frequent operation of the secondary compressor greatly increased energy use by the meat chiller.
- The compressor was loud enough that it could be easily heard down the corridor from the mechanical room. The noise level was considered a nuisance.

Solution

As development of the new Copeland Scroll K5 Refrigeration Compressor progressed, Emerson Climate Technologies began to seek out candidate locations for field trials. When OES brought the meat processor's problem to Emerson's attention, a field trial with the new compressor was recommended.

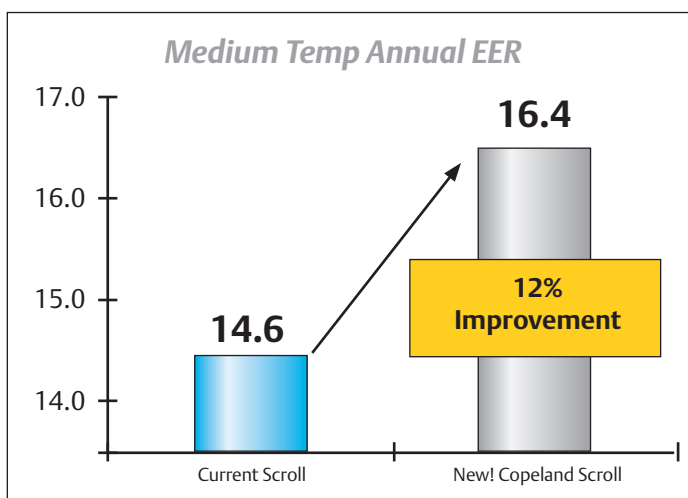
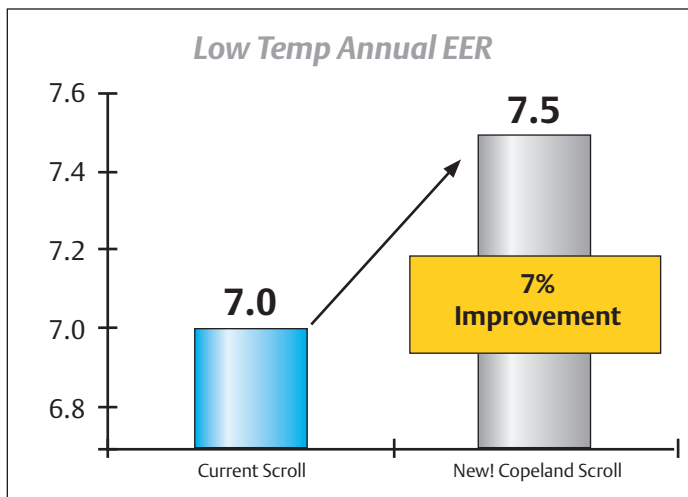
Emerson's engineers knew the Copeland Scroll would be a perfect candidate because of its raised suction inlet. With a higher suction port, the flow of refrigerant entering the compressor is diverted away from the oil sump and motor, resulting in very little oil pickup from

the sump while keeping the motor cooler than in previous scroll compressor designs.

When asked to take part in a field test of the new Copeland Scroll compressor, the end user was excited to participate. The existing compressor was replaced with a trial unit in March of 2010. Energy usage, run time, and other data for both the Copeland Scroll and the secondary compressor were recorded during the one-year trial period.

High-Efficiency Performance

Annual Energy Savings



Result

After one year, OES compiled a report and determined:

- The bearing problems experienced due to oil carryover in the original compressor were eliminated with the Copeland Scroll K5 Refrigeration Compressor. During the year-long trial, no problems were encountered with the Copeland Scroll compressor.
- During the trial, OES discovered the raised suction had the side benefit of keeping the very bottom of the compressor somewhat warmer, inhibiting the collection of liquid refrigerant in the sump to further prevent oil carryover.
- The Copeland Scroll K5 Refrigeration Compressor demonstrated a significant increase in capacity compared to the original, while power consumption was only slightly higher. Based on the report data, the Copeland Scroll compressor showed that the increase was sufficient enough that the secondary compressor now would be only rarely needed.

The end user was extremely satisfied with the operation of the Copeland Scroll K5 Refrigeration Compressor and expects a lengthy, trouble-free lifetime for the product.



All Copeland Scroll K5 Refrigeration Compressors come equipped with CoreSense™ Diagnostics.

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