

# Copeland Scroll™ compressor enhances food preservation around the world



## Result

- Reaches ideal temperature up to 25 percent faster than other compressors
- Digital modulation provides precise temperature control ( $\pm 0.5^{\circ}\text{F}$ )
- Lowest energy usage; 46 percent more energy efficient
- Corrosion protection and reliability in one of the most demanding environments
- More lightweight (95 lbs.), compared to typical semi-hermetic compressors, which are 325 lbs.

## Application

Refrigerated marine shipping containers.

## Customer

Dole, the world's largest producer and marketer of fresh fruits and fresh vegetables.

## Challenge

Thirty-seven billion pounds of bananas are shipped globally each year, making bananas the world's most popular produce. Bananas are consumed in every country on earth, but are grown in few by comparison, so they must travel thousands of miles before arriving in the local store.

Successfully transporting bananas is no easy task. As soon as bananas are harvested, they are placed into a refrigerated container while still in the field and brought to  $58.0^{\circ}\text{F}$  ( $14.4^{\circ}\text{C}$ ).

After that, they are hauled by truck to port, placed onto a seagoing vessel, transferred to a refrigerated warehouse at the receiving port, and then transported by refrigerated truck again to the store. If the temperature drops even a few degrees below the ideal temperature at any time during this process, the banana skin will develop dark spots and will not ripen properly. If the temperature rises a few degrees, premature ripening and shrinkage occurs.





## Solution

Modern refrigerated seagoing containers equipped with Emerson's Copeland Scroll Digital™ compressor technology provide precise temperature and humidity control, which have been shown to maintain temperature to within +/- 0.5° F (+/- 0.3° C). This is particularly critical for perishable products – like fruits and vegetables – which travel in seagoing containers on vessels that encounter harsh weather conditions and require tight climate control to protect quality. In the food industry where profit margins are narrow, any product degradation due to poor temperature and humidity control during transport is a significant financial concern.

Dole, the world's largest producer and marketer of fresh fruits and fresh vegetables, switched almost exclusively to the use of refrigerated container systems equipped with Copeland Scroll Digital compressors in 2005. Dole relies on Emerson's technology to rapidly remove heat from the container. At the point of harvest in the field, the digital scroll compressor 'pulls down' the temperature to the ideal level, and enables a 46 percent more energy efficient method for maintaining temperature control throughout the remainder of the bananas' journey.

Emerson estimates that use of its energy-efficient digital scroll compressors in refrigerated containers can enable the banana industry to save more than \$10 million in fuel costs and reduces shrink and spoilage by \$500 million annually. In addition, they reduce carbon emissions related to banana transportation by 15 percent.

Food shippers like Dole and many others have found that Emerson's Copeland Scroll compressor technology helps them better protect their valuable perishable products, save on energy costs and deliver environmental benefits.

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