

# ContainerLINE

## Purfresh™ Transport – A Fresh Approach to Protecting Perishable Cargo

Page 2

ALSO IN THIS ISSUE:  
PrimeLINE® Units Appeal to Chiquita's Green Nature  
Page 6



Ever-Changing Migration Patterns of Kiwifruit  
Page 8



## Foiling a Spoiler



No matter where you are in the global food chain, everyone can agree that losses from spoilage are costly.

Some studies show that up to 20 percent of fresh produce is damaged by microbial decay somewhere along the path to the consumer. Depending on the product shipped, damage to as little as 5 percent of a container's contents can cost thousands of dollars. The financial impact is substantial when you consider the estimated 4 million loaded refrigerated containers shipped annually. Think, too, of the carbon footprint penalty, as energy is generated and expended to deliver some portion of produce that ultimately becomes waste.

How does one combat omnipresent mold and bacteria? It's a dilemma for everyone in the food chain – the growers, exporters and importers, shipping lines and retailers. And consumers, concerned about food safety, are equally leery of residues from chemical treatments intended to thwart bacterial pathogens.

For all of these reasons Carrier is pleased to launch the Purfresh™ Transport service, a new, chemical-free way to help extend the freshness of food in shipping containers.

As you'll read in this issue, Purfresh Transport technology helps to eliminate the microbial pathogens inside a produce-packed container. That means increased deliverables, profits and consumer satisfaction.

Available to the marine container transportation market exclusively through Carrier, Purfresh Transport is a lease-per-use service within our SeaCare™ Solutions portfolio. This arrangement helps you to hold the line on costs – especially important during these times of economic strain, as I was reminded during my recent participation at the Cool Logistics 2009 conference in Hamburg. While the global economy was still a topic of great concern to most everyone there, it seems that reefer trade has weathered the chill of the crisis and is on track for growth next year.

After navigating our way through 2009, we're looking forward to a "fresh" start for 2010, in more ways than one.

**Kartik Kumar**  
Director of Marketing and Strategic Planning  
Global Container Refrigeration

## A Fresh Approach to Protecting Perishable Cargo

A strong protective link has just been added to the cold chain: the Purfresh™ Transport service from Carrier, an approved-organic method of protecting fresh produce shipped in refrigerated containers.

Carrier's Purfresh Transport service uses patent-pending science-based technology under an exclusive agreement with Purfresh, Inc. This technology uses ozone to continuously purify the air and surfaces inside the container, helping to eliminate molds, yeasts and microscopic bacteria that can attack and ruin a container-load of perishables. As a result, produce quality is preserved, resulting in better firmness, weight, sugar content and value.

Through this unique service, Purfresh Transport active purification systems are leased for container units on a per-trip basis as part of Carrier's SeaCare™ Solutions program, saving customers the expense of large capital outlays.

"With Carrier's expansive market access in the global shipping industry, we are pleased to offer the Purfresh Transport system, helping customers cost-effectively address critical issues of food safety and minimization of waste from spoilage," said Chiou Fun Sin, Carrier's vice president, Global Container Refrigeration. "This solution supports the food industry's critical goal of protecting the integrity of the cold chain.

*"...in a 35-day trial involving  
satsuma oranges, mold rejects  
were reduced by 37 percent  
through use of  
Purfresh Transport..."*

"Well established among growers, packers and food storage facilities, Purfresh, Inc. understands the cold chain and has tremendous leadership in the science of using ozone to maintain the quality and freshness of produce. Their technology is exceptional and a great complement to Carrier's services."

Based in the United States, Purfresh, Inc. was founded in 1996 and is dedicated to developing innovative clean-technology solutions that help purify, protect and preserve food and water. More than 400 customers in 42 countries rely on Purfresh products to help them deliver safer, fresher and higher quality food products to consumers around the globe.

### Safe, Effective Technology

"Up to 20 percent of post-harvest losses on average occur during transit," said Jim Taeckens, senior product manager, Carrier Container Products Group. "Using the

power of ozone, Purfresh technology helps eliminate bacteria before they spoil cargo and profits for growers, exporters, importers and shipping lines.”

The Purfresh Transport service can improve customer profitability by reducing typical loss related to decay and food degradation. It has been shown to improve the yield of perishable cargoes, according to Taeckens. For example, in a 35-day trial involving satsuma oranges, mold rejects were reduced by 37 percent through use of Purfresh Transport, resulting in a savings of \$3,700 per container.

“The effectiveness of this technology is remarkable,” Taeckens said. “Purfresh products have demonstrated their effectiveness both in laboratory studies as well as commercial trials on a broad range of climacteric and non-climacteric commodities—including citrus, berries, stone fruit, tropical fruit and rhizomes, such as ginger.

“The Purfresh Transport system provides 100-percent residue-free decay prevention with enhanced food safety,” Taeckens added. “As a chemical-free method of disinfection, it is especially well-suited for organic produce.”

Use of ozone is approved as organic by the United States Department of Agriculture and is approved by the United States Food and Drug Administration as safe for treatment of food. Ozone also helps regulate levels of ethylene, a hormone given off by fruits and vegetables that can accelerate the ripening process.

“The Purfresh Transport system enables our customers to maximize return on investment for all perishable shipments by helping to assure goods arrive at their destinations in optimal condition,” Taeckens said.

### An Exclusive SeaCare Solution

With the Purfresh Transport service, no large capital equipment purchase is required. One-way equipment rentals through SeaCare Solutions save shipping lines and container leasing companies the expense of purchasing the equipment and hassle of set-up.

Carrier-authorized service centers handle logistics, installation and removal of the Purfresh Transport systems on refrigerated containers prior to loading and after unloading at their final destination.

The Purfresh Transport model 2100 works with Carrier’s PrimeLINE®, EliteLINE® and ThinLINE® refrigeration units with a MicroLink® 2i or newer controller. It mounts to the refrigeration systems in place of the evaporator fan access panel.

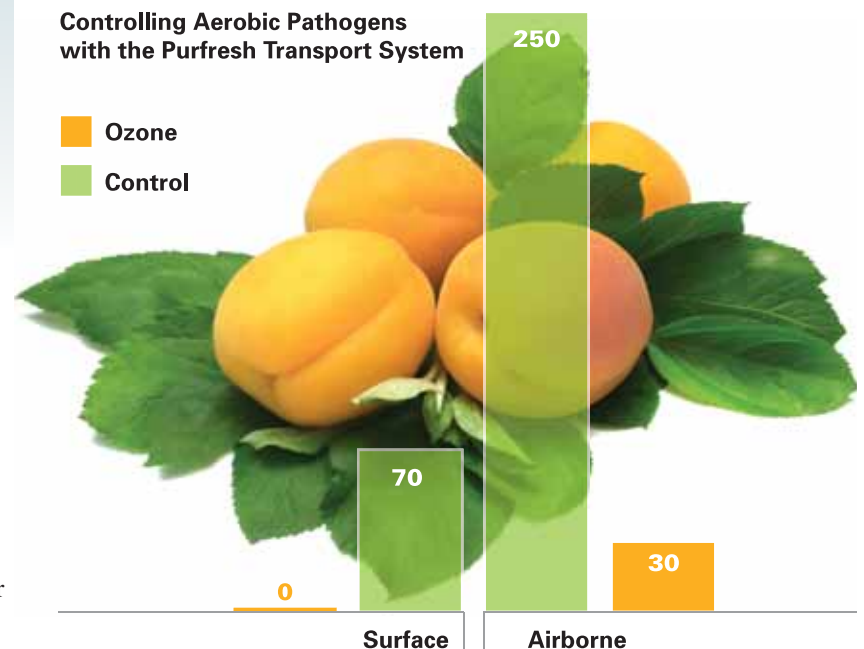
Purfresh Transport service will be available in the first quarter 2010, starting with shipping lanes originating in Chile and serving ports on the U.S. West Coast. Carrier plans to roll out the Purfresh Transport service globally throughout 2010. To find out more or arrange a demonstration, contact your local Carrier Transicold Service Center.



## Get More with Purfresh Transport

- Decay prevention
- Enhanced food safety
- Maintain natural taste
- Approved for organics
- Zero residue
- Ethylene control
- Simplified logistics
- No capital expense

### Controlling Aerobic Pathogens with the Purfresh Transport System

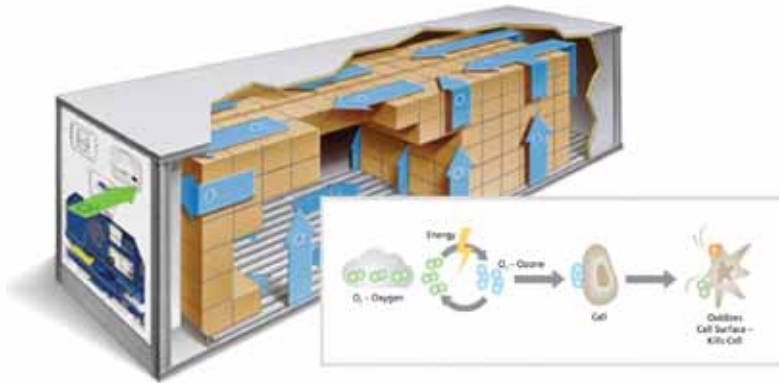


Yeast/Mold/Bacteria Count – Stone Fruit, 15-day trip



In banana trials, Purfresh Transport reduced crown rot by 85 percent.

## Purfresh™ Transport Technology: How it Works



The Purfresh™ Transport system uses oxygen to create powerful ozone molecules, which are then injected into the container atmosphere via the refrigeration unit in precisely controlled doses as low as 100 parts per billion (ppb).

The ozone helps to quickly destroy microorganisms throughout and then reverts to pure oxygen, leaving the product's taste, texture and smell characteristics in their natural state.

As an active purification system, Purfresh Transport manages the container's atmosphere during the entire trip by adapting to changes in the organic load of the cargo, such as microbes, volatile organic compounds and ethylene levels.

Unlike atmosphere treatment systems that draw air into a special chamber for sterilization by ultraviolet light, the Purfresh Transport system disperses ozone throughout the container, helping to eliminate microbes both in the air and on surfaces, including on the produce itself, as well as container interior walls, boxes, pallets and the refrigeration unit coils and ducts.

By eliminating bacteria and microbes throughout a container, the Purfresh Transport service from Carrier provides a unique, chemical-free approach to extending shelf life, minimizing waste and optimizing freshness and quality of produce during long-distance transport.



## Protecting the Food Supply



In the 21st century, maintaining the safety and integrity of the global food supply is a leading cause for concern among consumers, governments and food-producing industries alike.

And no wonder: In the United States, where the food supply is generally considered to be among the safest in the world, widely publicized breakouts of Salmonella and E. coli in recent years revealed weaknesses along food's path from farm to fork.

In response, the U.S. House of Representatives in July passed the "Food Safety Enhancement Act," designed to give the U.S. Food and Drug Administration (FDA) more authority and resources to prevent food-borne illnesses. Meanwhile the U.S. Senate was crafting its own version, the "FDA Food Safety Modernization Act." Both bills were expected to go before Conference Committee this fall.

In Europe, which has had its own share of food scares, the European Commission's Food Quality and Safety program supports research to develop an environmentally responsible production and distribution chain to deliver safer, healthier and more varied food. The Belgium-based Global Food Safety Initiative was established in 2000 to pursue continuous improvement of food delivery systems through recognition of various food safety standards, with a goal of bringing consistency to food-sourcing supply chains around the world.

"Thanks to globalization, the routes traveled by food products to reach consumers have gone from just a few miles – from the field to the table – to thousands of miles with multiple stops, opening many doors of vulnerability," said Kartik Kumar, director of Marketing and Strategic Planning for Container Products.

"Distribution standards and oversight may vary in different parts of the world, but one constant of food safety is maintaining a strong cold chain," Kumar said. "From a

## A Proven Winner

When it comes to maintaining the freshness and quality of perishables, the use of ozone in refrigerated containers may be relatively new, but the technology has actually been proven for decades in stationary applications such as refrigerated cold-storage facilities.

Ozone's viability for transport applications was further demonstrated through extensive testing of the Purfresh™ Transport active purification system by Purfresh, Inc., working with Carrier Transicold in cooperation with numerous growers and shipping companies. Some of the results are shown here.

**Bananas** – In a 56-day study with a major banana producer comparing a container with untreated atmosphere to one treated with the ozone-based Purfresh Transport system, researchers observed a 90 percent reduction in surface mold. Additionally, by controlling ethylene, climacteric ripening was avoided, resulting in Color Grade 1 being maintained for 80 percent of the shipment.



**Stone Fruit** – In a side-by-side comparison of nectarine shipments, the Purfresh Transport system consistently outperforms traditional gas-injection modified-atmosphere (MA) systems, indicating significant advantages in preserving produce quality as evidenced by measurable differences in firmness, weight and sugar content. In one study, Kay Pearl nectarines were transported from California to Taiwan, a 14-day voyage. The post-trip evaluation of the fruit surface and container environment revealed that the Purfresh Transport system outperformed the MA treatment on net weight loss, fruit pressure, Brix (sugar) content and microbial counts. Using the Purfresh Transport system extended the shelf life of the fruit, minimized waste and repack and reduced costly waste-related claims processing.



**Pineapples** – The Purfresh Transport system was shown to be more effective than post-harvest fungicides in a pineapple shipment from Costa Rica to the United Kingdom. During the 16-day transatlantic shipment, the pineapples in the control container were treated with a typical fungicide and wax combination; the pineapples in the container using Purfresh technology were left in their natural state – without treatments that leave heavy residues undesired by consumers. At the end of the voyage, the pineapples in the container equipped with the Purfresh Transport system had 95 percent less bacteria than the control shipment, demonstrating Purfresh technology's ability to respond to consumers' growing desire for chemical- and fungicide-free produce.



**Table Grapes** – In one of the most recent studies, Purfresh technology was shown to outperform sulfur dioxide pads for maintaining quality of table grapes during long-distance ocean voyages. Table grapes are particularly susceptible to airborne and surface mold in high-humidity storage environments, yet sulfur dioxide has come under scrutiny because of its effect as an allergen and negative effects on grape quality. In three separate tests using multiple table grape varieties from Chile, ozone was shown to be more effective at maintaining stem color, fruit pressure and weight. Plus, as a 100-percent residue-free alternative to protecting grapes, it was effective at maintaining natural flavors.



In summary, container atmosphere management with ozone using the Purfresh Transport service from Carrier is a proven, chemical-free method to help thwart mold and fungus, maintain quality of perishables, control ripening and reduce waste from spoilage, all of which can add up to improved profitability for growers, shippers and shipping lines.



global perspective, Carrier container refrigeration products have played a leading role in helping to protect food in transit for more than 40 years.”

Carrier's PrimeLINE®, EliteLINE® and ThinLINE® units provide growers, shippers and shipping lines with precise temperature control on ships and in port.

Equipped with data recorders, Carrier container refrigeration units provide traceable evidence that temperature integrity was maintained throughout the voyage. Cold-chain visibility products from Carrier's Sensitech business unit can extend asset tracking from point of origin to final destination, with analytical tools that drive measurable process improvement for customers' supply chains.

Carrier's EverFresh® Controlled-Atmosphere option fine-tunes container oxygen and carbon dioxide levels, which among many benefits, can also help suppress decay-causing fungi and microorganisms that threaten perishables in transit. The new Purfresh™ Transport service gives customers another tool to thwart microscopic pathogens. Landside, PowerLINE® generator sets enable refrigerated containers to operate over the road in keeping with Hazard Analysis and Critical Control Point guidelines. In terms of “food defense,” Carrier's Performance Parts Group offers an array of tamper-resistant container locking devices.

“Carrier solutions help assure food products are protected in transit over extended distances, while providing accountability and investment returns for the cold chain,” said Kumar.

“There is no question that food distribution and safety regulations are going to be at the forefront over the next several years, especially with continued growth of international commerce,” he said. “Carrier will continue to respond with products that maintain confidence in the transportation links of the cold chain.”



## PrimeLINE® Units Appeal to Chiquita

A yellow banana is a ripe banana, but a “green” banana company is an environmental leader.

Such is the case with Chiquita, which this summer received the 2009 Circle of Excellence Award from the Distribution Business Management Association for its green transportation initiatives focusing on reduced carbon emissions. Chiquita has also been listed among the world’s top 20 sustainable stock picks by Progressive Investor newsletter for its high environmental standards, corporate responsibility and financial strength.

So Chiquita’s selection of 1,250 Carrier PrimeLINE® units for its most recent refrigerated container purchases was a fitting choice.

Designed to reduce environmental impact and lifecycle cost, PrimeLINE units are the most efficient container refrigeration units available. All of the new Chiquita units are equipped with QUEST power-saving mode, a control software feature that enables further energy savings by intelligently cycling refrigeration on and off based on temperature limits designed for specific perishables.

“Energy savings is important,” said Juan Guell, equipment director for Chiquita. “We included QUEST because, for us, it’s very important from the energy side and for the carbon footprint.”

Reducing energy requirements not only cuts fuel consumption, but also provides a proportionate decrease in emissions related to shipboard energy production. This lends itself well to Chiquita’s green transportation initiatives.

“With the new PrimeLINE units, the idea will be to keep building on that,” said Guell. “These units will definitely contribute significantly.” In keeping with its green transportation initiatives, Chiquita will also have the opportunity to add QUEST power-saving mode to some older units.

### Leading the Bunch

With a 25 percent share of the global banana industry, Chiquita is one of the leading distributors of bananas in the United States.

It all started simply enough back in 1870 when a sea captain by the name of Baker purchased 160 bunches of bananas in Jamaica and sailed them to New Jersey in 11 days to sell at a profit. That enterprising shipment eventually blossomed into a fruit shipping company.

*PrimeLINE units with QUEST power-saving mode support Chiquita’s green initiatives.*





## Chiquita's Green Nature

Nearly 140 years later, including many pioneering advances in the harvesting, refrigeration and ripening-control of bananas in transit, Chiquita Brands International is among the top bananas in the business. Chiquita is also a marketing pioneer, having created the now iconic "Miss Chiquita" character and jingle to teach people about the nutritional value of bananas and when to best enjoy them.

Carrier Transicold has been helping Chiquita deliver bananas to consumers since 1988, when Chiquita acquired its first ThinLINE® unit. The units purchased from the late '80s and early '90s are among those now being replaced by the PrimeLINE units, testament to Chiquita's care of those containers and the durability of the units.

The new PrimeLINE units will be used on routes from Central America, 95 percent of which are destined for North American ports, where Chiquita banana containers are transferred from ship directly to truck chassis for inland delivery.

### Appealing Weight Reduction

Guell notes that the PrimeLINE units are significantly lighter than the units they replace. "For banana companies, weight is the number-one issue. We are watching every single kilo."

Although Chiquita's new custom-engineered 40-foot containers are steel, and thus heavier than the aluminum boxes they replace, the gain is offset by the PrimeLINE unit's lighter weight. This means no compromise to the number of pallets Chiquita can load in each container, helping Chiquita maintain efficiencies and economies, while still allowing its rigs to stay within California Vehicle Code 80,000-pound gross weight limits.

"Speed of pulldown is also extremely important to maintain high product quality, especially in the hot tropical climates," Guell added. "Versus an older container reefer, the PrimeLINE unit can reduce the pulldown time by half."

As a 100-percent Carrier fleet, Chiquita has a mix of ThinLINE reciprocating units and more recently acquired EliteLINE® scroll units. From a maintenance perspective, the similarity between the PrimeLINE and EliteLINE units was an advantage, he explained.

"We like the simplicity of the design, which compares to the EliteLINE. Very few components change, so we don't have to inventory a lot of different spare parts."

## Carrier Environmental Initiatives Honored by Freight Industry

Carrier Transicold was named an Environment Award finalist in the 2009 Freight Industry Awards, sponsored by *International Freighting Weekly* in association with Lloyd's Loading List.

Now in its 13th year, the Freight Industry Awards program includes "Reader's Choice" and judged awards recognizing freight haulers on land, sea and air and support providers for leadership, innovation and excellence in freight distribution. One of the judged entries, Carrier's nomination for the Environment Award emphasized the



benefits fleets derive from using the PrimeLINE® container refrigeration unit and the QUEST power-saving mode to reduce fuel consumption and emissions related to power generation. It was noted in the entry that Carrier Transicold had already exceeded its aggressive 2010 goals for reducing greenhouse gas emissions, water consumption and industrial process waste.

"We are honored to have been named a finalist in the IFW program," said Kartik Kumar, Carrier's director of Marketing and Strategic Planning – Global Container Refrigeration. "We consider it a responsibility to make an environmental impact within the freight shipping industry by providing systems that require less energy to operate, and hence reduce the shippers' consumption of fossil fuel to generate electricity. Recognition by the industry for these efforts reaffirms our commitment."

# Ever-Changing Migr of Kiwifruit

With a hairy brown peel, emerald-green or golden cores, and a taste resembling a combination of strawberry, pineapple and banana, kiwifruit are in a class by themselves – if for no other reason than being named for a rather unique bird, New Zealand’s wingless kiwi.

The fruit grows on vines similar in appearance to grape vines and are actually native to northern China’s Yangtze River valley, where they are called yáng táo. Although the egg-sized fruit have been cultivated in China for many centuries, today’s estimated \$3.4 billion (U.S.) global kiwifruit industry is a product of recent history, owing much to the fruit’s “discovery” and adoption for commercial production by enterprising New Zealanders.

It started in a rather unassuming way back in 1904, when a New Zealand girls’ school teacher returned from a visit to China with some yáng táo seeds. She put them into the able hands of a local horticulturist who got them to sprout, with the plants producing fruit before the end of the decade. At the time, the New Zealanders dubbed them “Chinese gooseberries.”

In 1928, nurseryman Hayward Wright found that the volcanic soils and mild maritime climate of New Zealand’s Bay of Plenty were perfect conditions for Chinese gooseberry vines. His cultivar, the “Hayward,” had an exceptionally large fruit with superior flavor and good storage qualities, and before long was grown by the region’s farmers. Today, with 1.7 million metric tons of kiwifruit grown around the world, the Hayward remains, by a significant margin, the most popular variety for export.

## Kiwifruit Exports Take Flight

In 1952, New Zealand exported Chinese gooseberries for the first time, with a shipment destined for England, and soon Chinese gooseberries from New Zealand were headed elsewhere in Europe, as well as Japan and North America. Paying homage to New Zealand and its national bird, the fruit was renamed “kiwifruit” for marketing purposes in 1959. Thereafter, the fruit export business took flight, even though the namesake bird remained hopelessly grounded.

New Zealand’s annual kiwifruit production, a mere 300 metric tons in the late 1930s, grew to 40,000 tons by the 1980s and reached 410,000 tons in 2008 – about 60 percent of New Zealand’s total fruit and nut exports. Asian markets and the European Union are the leading destinations for New Zealand kiwifruit exports, followed by North America.

New Zealand’s success in creating a global market for kiwifruit was driven by its growers, whose Kiwifruit Marketing Board evolved into Zespri International Ltd. in 1997, a cooperative of 2,700 growers focused on cultivating a global preference for Zespri® brand kiwifruit.

“Zespri is the leading marketer of kiwifruit worldwide, with over 30 percent share of the market,” said David Tanner, Zespri’s head of Global Technical and Innovation. “We remain number one year-on-year because of our commitment to delivering top quality, great tasting fruit.”

Perhaps inspired by New Zealand’s success, growers elsewhere embraced kiwifruit, with Italy and Chile now rivaling New Zealand’s dominance as exporters.

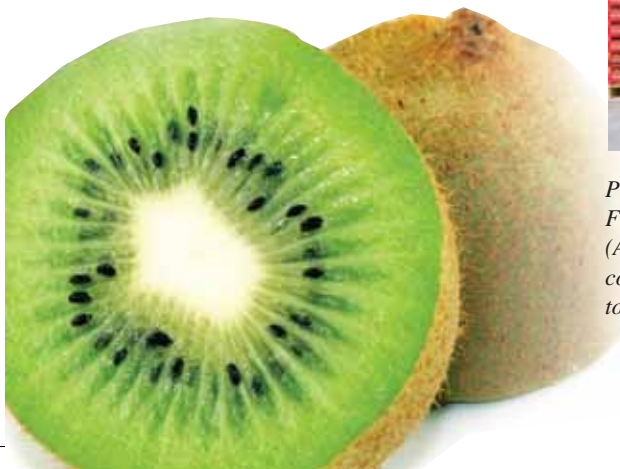
In fact, Italy produces more kiwifruit than New Zealand, although it exports less, with most headed to neighbors in Europe.

Chilean kiwifruit growers, collectively the third largest exporter, ship nearly all of what they produce, with most destined for Europe and North America.

And what of China, kiwifruit’s original homeland? It’s actually the world’s largest producer according to Desmond O’Rourke, president of Belrose, Inc., publisher of the annual Global Kiwifruit Review, which estimates Chinese kiwifruit production at about 475,000 metric tons. Yet China consumes virtually all of what it grows.



Personnel from Zespri International, Ltd., check a load of kiwifruit as it is prepared for shipping. For precise ripening control during transit, Zespri takes advantage of automated setpoint control (ASC), a feature that allows container temperatures to be adjusted on a timed basis. ASC is common to Carrier refrigeration units with ML2i and newer controllers, which now allow up to six ASC setpoints.



# Exportation Patterns



● CHILE: 170,000 MT / 94% ● NEW ZEALAND: 410,000 MT / 92% ● ITALY: 450,500 MT / 62% ● CHINA: 475,000 MT / 0.4%

Metric Tons Produced / Percentage Exported

## Healthy Growth through Diversity

It is no wonder that kiwifruit has its aficionados. According to the California Kiwifruit Commission, kiwifruit is the most “nutrient dense” of all major fruits, with more vitamin C than an orange, more potassium than a banana and ample amounts of folate, copper, fiber, vitamin E and lutein.

“Twenty years ago, kiwi was *the* wonder fruit. It was the first of the new exotics to get a wide following,” O’Rourke said. “It really is a wonderful fruit from a health perspective.”

Because of its dominance in the industry, the Hayward variety – today branded as ZESPRI® GREEN – is likely what most consumers envision when they think of kiwifruit. With its green interior, black seeds and small white core, it has “a sweet-sour taste combination,” according to Zespri.

“For a long time, retailers just wanted to stock one variety of kiwifruit, and that was the green Hayward,” O’Rourke said. “The New Zealanders have done a wonderful job of developing a gold kiwifruit, which they have patented and licensed as ZESPRI® GOLD.”

With its golden interior, this variety is described by Zespri as having a sweet, tropical taste and a juicy texture. The

added-value ZESPRI GOLD now represents a quarter of Zespri’s business. But again, inspiration on the part of New Zealand has bred imitation elsewhere.

“It was so successful that it encouraged a lot of people to look for different skinned kiwifruit and different flesh color, so there’s all sorts of reds and oranges and ‘what not’ that are coming along,” O’Rourke said. Chile, which predominantly produces the Hayward variety, has expanded its kiwifruit selection with varieties such as golden, Jin Tao and Summerkiwi, an early variety. Zespri, in turn, has invested \$8.1 million in new varieties over the past five years and has the world’s largest breeding program with 50,000 seedlings under evaluation.

With growing demand for organic fruit, some growers are also expanding their portfolios with varieties certified to stringent organic standards.

“The Italians and New Zealanders in particular are now working with the Chinese to use their plant material,” O’Rourke said, “and I suspect you’re going to see a lot of newer varieties coming out of that sort of cooperation. So things could get shaken up quite dramatically in the next few years.”

It seems a kaleidoscope of kiwifruit may soon be on the horizon.

## The Science of Shipping Kiwifruit

When it comes to transporting kiwifruit, no one has more experience than Zespri International Ltd. Each year, Zespri ships tens of millions of trays of kiwifruit on both charter vessel and containerships. ContainerLINE spoke with David Tanner, Zespri’s head of Global Technical and Innovation, about the science behind shipping kiwifruit on voyages that range from five to 45 days.

### Does kiwifruit require special refrigeration parameters to maintain freshness or control ripening?

During the regular shipping season, our green variety, ZESPRI® GREEN, is transported at -0.8°C. Our proprietary gold variety, ZESPRI® GOLD, is transported at +1°C, due to the gold being susceptible to chilling injury if transported at lower temperatures. We use the lowest marked vent setting for air refresh and do not use gas modification. It is important that ethylene levels are maintained very, very low, as kiwifruit is very sensitive to ethylene, which enhances the rate of ripening.

### How is the refrigeration unit’s automated setpoint control (ASC) utilized for kiwifruit exports?

Zespri utilizes ASC during the early part of its season with its ZESPRI GOLD variety predominantly. By using ASC to regulate temperatures up as the container approaches the market, the fruit can be encouraged to soften in readiness for delivery to customers. If we were able to, we would exclusively use ASC due to its reliability and the fact that we do not need to rely on the vessel to make container setpoint changes.

### Zespri has been a leader in analyzing the comprehensive carbon footprint of New Zealand kiwifruit and has said it will now look to lower its shipping carbon footprint. How will this affect Zespri’s use of container refrigeration?

We are always looking for good numbers on the container vessel, and therefore container, footprints. We continue to invest in better optimizing our inventory management systems to reduce fruit loss in transit, as this can also be a significant contributor to our shipping carbon footprint.

Read the entire interview at [www.container.carrier.com](http://www.container.carrier.com).

## Turn to the Expert Anton van Rooij

Binoculars in hand, Anton van Rooij keeps a watchful eye on the ship traffic moving in and out of the Port of Rotterdam from his home on the coast, about 12 kilometers away.

From this vantage, he has observed the construction of Europe's newest and most sophisticated container-handling terminal, Euromax, with its dozen towering blue and orange quay cranes and 5 million TEU capacity.

On a clear day, van Rooij can count the shipboard reefer containers, which he is happy to report are greater in quantity now than they were earlier in this recessed year. As Carrier's regional sales manager for Europe, Middle East and Africa, he has a keen interest in refrigerated trade through Europe's largest port, and more importantly, the decision-process that goes into refrigeration unit selection.

A lifelong Hollander, van Rooij started working in industrial product sales as a manufacturers' representative while still a student at the Hogere Technische School in The Hague. He continued on a sales path after earning his bachelor's degree in mechanical engineering in 1985, taking on positions of increasing responsibility in equipment sales and marketing for companies serving the oil, gas, chemical petrochemical and factory automation businesses.

The seasoned professional brought that depth of sales experience with him when he joined Carrier in 2001. He completed his master's degree in business administration from Webster University, Leiden, the Netherlands, in 2002 and today oversees Carrier's sales team serving Europe, the Middle East and Africa and has stewardship for some of Carrier's most important customers based in Europe.

In his eight years with Carrier, van Rooij has seen a sea change in the way container refrigeration systems are bought.

"The container industry has matured over the years and has become more professional," van Rooij said. "Just five or six years ago, the primary drivers were price, reliability and relationships.

"Now, most customers are looking beyond the unit's specs and price and are

factoring total cost of ownership and environmental impact into their equipment purchase decisions.

"People realize that there is a lot more to the cost of a refrigeration unit than the initial purchase price. If you look at the fuel required to generate the electricity to operate a unit over its lifetime, it can easily be 40 to 50 percent of the total cost of ownership," he said.

"Everyone is focused on energy consumption, and equipment makers are all saying the same thing – 'Buy our unit because it's the most energy efficient one,'" van Rooij said.

For customers unsure of how to make sense of competing claims or evaluate energy consumption for themselves, "We recommend they do trials with energy meters," van Rooij said, adding, "Some shipping lines have independent laboratories look at them."

According to van Rooij, in the end "the facts speak for themselves," which is why products like the PrimeLINE® unit and QUEST power-saving mode are proving popular in these recessionary times.

You don't need binoculars to see that.



*Anton van Rooij in front of the new Euromax Terminal in Rotterdam.*

## Performance Parts Group Earns ACE Silver for Customer Focus



A customer-focused business approach that is yielding positive results recently earned Carrier Transicold's Performance Parts Group a "Silver" designation in parent company United

Technologies Corp.'s. (UTC) Achieving Competitive Excellence (ACE) program.

ACE is a set of guiding principles that keeps the organization focused on being the provider of choice for customers. In the case of the Performance Parts Group, ACE Silver recognizes improvements made by sales and distribution operations in Syracuse, N.Y., Rotterdam, the Netherlands and Singapore.

Improved customer satisfaction scores obtained through a comprehensive market feedback survey were key to achieving

ACE Silver, the second highest level of the program, according to Ralph Bott, general manager for the Performance Parts Group. Expedited fill rates, faster issue resolution time and improved on-time delivery performance all contributed as well.

"It's all about developing a culture of continuous improvement," Bott said. "We listen to the customer and focus on processes that are important to them."

"The Performance Parts Group has been so successful because they are very customer focused and work well together as a team," he said, adding, "That starts at the top and works throughout the organization."

The Performance Parts Group provides replacement components and aftermarket accessories for all Carrier Transicold business units. Within the Container Products Group, Performance Parts has responsibility for 14 global parts depots and five electronics rebuild facilities.

## New China Facility! Carrier Completes Global Chain of Electronics Repair/Rebuild Operations

Carrier Transicold's new electronics repair and rebuild operation in China significantly expands Carrier's service capabilities by improving support to Pacific Rim ports, parts depots and service centers.

Located in the port city of Tianjin, near Beijing, it is the first Carrier facility of its kind in the Eastern hemisphere. It brings to five the number of electronics rebuild operations in Carrier's global network, which began just 10 years ago with a single facility in Rotterdam, the Netherlands.

Carrier's world-class electronics repair and rebuild operations offer the highest standard of diagnostic and repair services for complex refrigeration unit controls. The Performance Parts Group has taken great care to assure the facilities in North America, South America and now Asia all deliver the same quality, reliability and excellence of the original facility in Europe.

To provide customers with uniform high-standards of service throughout the world, great care is made to assure consistency among the operations, from technician training to tools, procedures, technology and testing devices, many of which are made by Carrier. The Tianjin operation is no exception.

"All the diagnostic tools are built by the Performance Parts Group in Rotterdam – custom-made for our electronics so as to maintain the high Carrier standard," said Terry Sau, regional manager for Carrier's Container Parts Asia-Pacific Operations, noting that Tianjin technicians also received a month of training at the Rotterdam facility.

Carrier electronics repair facilities are a cut above third-party repair facilities because of the comprehensive diagnostics

run on each electronic component in a controller using equipment that is exclusive to Carrier. Add to that Carrier's exhaustive electronic systems knowledge, including performance and repair histories, and the one-year global warranty backed by Carrier Transicold service centers worldwide.

"It's the standard of care all the shipping lines require," Sau said.

The 28,000 square-foot Tianjin facility is also a parts distribution point, stocking about 180 different items within the warehouse. For service centers along the China coast, this reduces the time Carrier previously needed to ship from parts depots in Hong Kong or Singapore. Likewise, the Tianjin rebuild operation helps keep Carrier's regional parts depots fully stocked with electronics components that may be needed for refrigeration unit repairs.



## Welcome Aboard

Carrier offers the most comprehensive sales and service network in the industry with nearly 420 service center locations worldwide in all major and developing ports. The following service centers recently joined our ever-growing global base.

### Djibouti – Djibouti

Djibouti Container Service  
Contact: Mr. Joseph P. George  
dsc.gm@dpworld.com  
+253 35 45 70

### Salalah – Oman

Salalah Port Services  
Contact: Mr. Jose Mateo  
Jose.Mateo@salalahport.com  
+968-219500

### Marin and Vigo – Spain

Transitarios Globales, S.L.  
Contact: Mr. Ignacio Crespan  
icrespan@transglobal.es  
+34-986-883988

### Dubai – United Arab Emirates

DP World, UAE Region  
Contact: Mr. John Sturdy  
john.sturdy@dpworld.com  
+971 4 8815000

### Aden – Yemen

Arabian Trading & Engineering Services  
Contact: Mr. Mustafa Anwer  
Ibrahim Ali  
ACR@Yemen.net.ye  
+967 (2) 258455

For more information about these and other Carrier container service centers, please visit [www.container.carrier.com](http://www.container.carrier.com).

## Cool Logistics 2009

At the recent Cool Logistics 2009 in Hamburg, Carrier's Kartik Kumar, director of Marketing and Strategic Planning – Global Container Refrigeration, delivered a talk on refrigerant trends and developments. He was part of a series of distinguished experts discussing reefer transport technologies.



## Personnel Update



Shari O'Shea has been named Container Sales and Marketing Manager for Carrier Transcold's Performance Parts Group. In her newly expanded role, she adds oversight for container parts sales in the Americas to her previous responsibilities

for marketing Performance Parts globally. She will work closely with Performance Parts operations in Rotterdam and Singapore, ensuring efficiency and consistency in Carrier's customer approach in North and South America. This year marks O'Shea's 10th anniversary with the Performance Parts Group, having joined in 1999 following four years with Carrier's Replacement Components Division.

### Shari O'Shea

Carrier Transcold  
Performance Parts Group  
P.O. Box 4805  
Syracuse, NY 13221 U.S.A.  
Tel: +1-315-432-3605  
Fax: +1-315-432-3778



## ContainerLINE

Please send your comments and story ideas to:  
[jon.shaw@carrier.utc.com](mailto:jon.shaw@carrier.utc.com)  
ContainerLINE  
Carrier Transcold  
Communications Department  
P.O. Box 4805  
Syracuse, New York 13221 U.S.A.

Editors: Jon Shaw, Melanie Heaphy  
Telephone: +1-315-432-6442  
Fax: +1-860-998-1351  
[www.container.carrier.com](http://www.container.carrier.com)

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