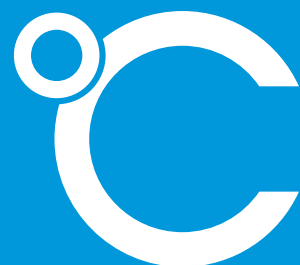




Autumn 2013
THE NEWSLETTER FROM DAIKIN REEFER



DEGREE CELSIUS

Controlled Atmosphere technology

How Daikin preserve the condition of fresh fruits

Resale energy saving

DTMS II power-saving software in the resale market

To Russia with love

Daikin Reefer 'touch and feel' seminars in St Petersburg, Vladivostok and Moscow

Dole adds to its Daikin reefer fleet with 400 new Zestia units





Katsuhiro Tetsuya, Director of the Daikin Reefer Container Division

Welcome

From Katsuhiro Tetsuya, Director of Daikin Reefer Container Sales Division

Welcome to our Daikin Reefer Autumn 2013 newsletter, issued to coincide with the Intermodal 2013 show in Hamburg. Daikin Reefer will be exhibiting once again at this important trade fair for the container industry and we look forward to meeting many customers, business partners and friends from around the world.

World container shipping remains in uncertain waters and refrigerated shipping is no exception. Measures such as the recent launch of the 18,000TEU Triple-E vessel by Maersk Line and the P3 alliance between CMA CGM, MSC and

We believe it is our fundamental duty to help our customers generate more profit by providing the best refrigeration machinery and worldwide support services

Maersk – the world's three largest carriers – are aimed at helping the industry to reduce its costs and improve its capacity management.

Some of the big carriers have announced better financial results this year, which is encouraging. Marinenet reported recently that container trade for June 2013 increased 9.7% compared to the previous year, with particular improvement on the Asia-Europe route. But industry analysts continue to warn about ongoing volatility in rates and volumes on many routes, plus the new challenges being caused by cascading large ships down onto smaller trades. For now, it seems, the shipping industry has not yet gained the stability that it is seeking.

As a global supplier to the world's refrigerated container shipping lines, shippers and leasing companies, Daikin has naturally pondered on this prolonged period of difficulty and how we can respond. We believe that it is our fundamental duty to always try and make it possible for customers to generate more profit and increase their competitiveness. We achieve that by providing the best quality refrigeration machinery and worldwide support services that reduce our customers' operating costs and allow them to deliver a highly reliable and trustworthy service to their clients.

As part of our continuous development philosophy, Daikin Reefer is constantly expanding our after-sales service around the world, with the goal of providing the most solid customer support. And, of course, we are also exploring a range of next generation technology enhancements.

For our premium Zestia inverter compressor machine, we are now focused on researching new features to enhance climate control for fresh produce, both to prolong the life of the produce and to tackle pathological problems that occur during transport. This includes the development of a controlled atmosphere (CA) system as a priority project, as well as exploring how the existing Daikin 'streamer' technology could be adapted to reefer units to help tackle fungus and bacteria. You can catch a glimpse of our streamer technology in this issue on page 5.

As many of you will know, we have also continued to invest in our established LXE series of scroll compressor equipment. We've made dramatic strides in reducing the LXE's power consumption, which is now around 50% lower than when we first launched the machine. We will continue

We have made dramatic strides in reducing the LXE's power consumption, which is now around 50% lower than when we first launched the machine

to research further improvements to keep the LXE at the forefront of operational reliability, low energy usage and excellent temperature management.

There is no doubt that, in today's hyper-competitive market, Daikin Reefer has its work cut out to make sure we remain the supplier of choice around the world. Please stop by to see us on Stand D12 at Intermodal Europe, where we would welcome the chance to personally show you our units and all the latest technology features – and of course to extend you some warm hospitality from Japan.

Katsuhiro Tetsuya
Director
Reefer Sales Division

Daikin technologies

Protecting perishable cargos – beyond refrigeration

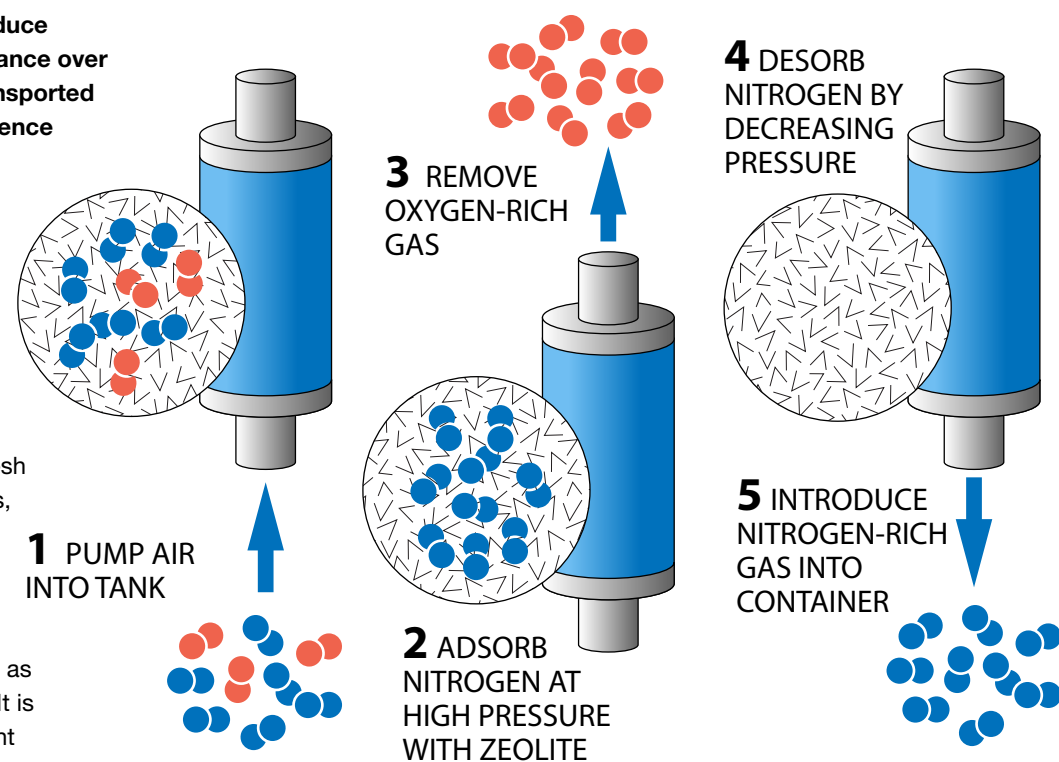
Daikin is developing new climate control technologies to prolong the life and preserve the condition of fresh fruits, vegetables and flowers in long-distance transport

Temperature control remains the absolute number one priority for the successful long-distance containerized transport of fresh produce. However, other complementary technologies also have a role to play in maintaining produce quality, extending the distance over which cargoes can be transported and preventing the occurrence of common pathological problems.

One of these is Controlled Atmosphere (CA) technology. By altering the percentages of oxygen, carbon dioxide and nitrogen inside the container, CA can delay the ripening of fresh vegetables, fruit and flowers, effectively putting them into a state of hibernation. CA is particularly effective for fresh cargoes with a high respiration rate, such as banana, avocado and kiwi. It is also considered an important technology for sensitive commodities such as berries and fresh cut flowers. The other is sterilization, to prevent the

emergence of fungus and bacteria, as well as to inhibit the production of ethylene, a natural ripening hormone. Sterilization is especially effective for cargoes such as grapes, cherry, mango and pineapple.

Controlled Atmosphere technology
Fresh cargoes including fruits, vegetables and flowers naturally respire – and therefore ripen – during transport. Reducing the concentration of oxygen and increasing the volume



Based on pressure swing adsorption, Daikin's patented Controlled Atmosphere technology reduces oxygen concentration in the container to extend produce life

of nitrogen inside the container slows this process. A variety of technologies have so far been developed to passively modify, or actively control, the mix of atmospheric gases inside the container, all with the aim of delaying ripening and thereby extending produce life.

Daikin has chosen to focus its efforts on pressure swing adsorption (PSA), a technology that works essentially by separating gases under pressure according to each gas's molecular characteristics and its affinity for an adsorbent material. PSA processes rely on the fact that, under high pressure, gases tend to be attracted to solid surfaces, or 'adsorbed'. The higher the pressure, the more gas is adsorbed. When the pressure is reduced, the gas is released, or 'desorbed'. Common adsorbents used in PSA systems include activated carbon, silica gel, alumina and zeolite. For our development work, Daikin has selected zeolite, due to its excellent ability to extract nitrogen from air. Zeolite is also a 'molecular sieve', meaning that it has the ability to naturally filter gas molecules according to their size.

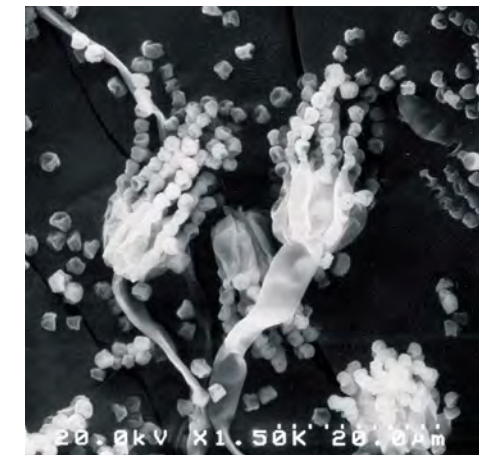
Daikin's patented technology for CA is actually based on vacuum pressure swing adsorption (VPSA), a hybrid method that combines PSA technology – where pressure is used to separate gases – with vacuum swing adsorption (VSA), where a vacuum (suction) is used. By combining pressure and vacuum technologies in a dual function compressor, VPSA is considered to be among the most efficient of all systems for gas separation and recovery, leading to a smaller unit and lower power consumption.

Daikin considers VPSA to be the ideal technology for container CA, due to its ability to produce a very rich nitrogen stream from a compact and energy saving unit. Also, unlike selective transmission membranes – another technology used currently for container CA – VPSA does not trap moisture as well as oxygen. Therefore the rich nitrogen stream released into the container is also moist, ensuring produce does not become dehydrated. Additionally, the VPSA dual function compressor is oil-less, using fluoro resin technology instead to avoid any oil taint on the cargo.

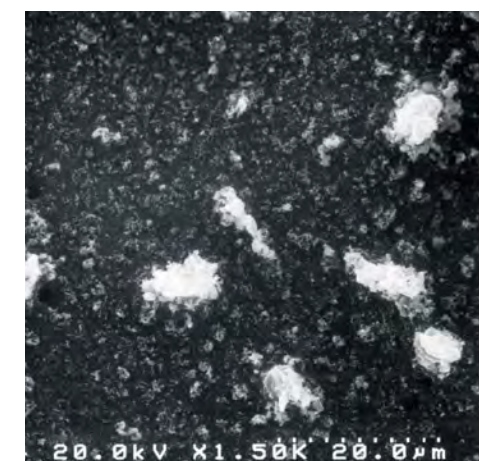
Flash streamer technology

Flash streamer technology is already widely used in Daikin's commercial and residential air conditioning business for highly effective air purification. The streamer works by discharging high energy electrons which analyze, rapidly decompose and remove molecules of allergens, odors, bacteria, fungus and other hazardous chemical material by collision with high-speed electrons discharged from streamer unit. Compared with standard plasma-type systems, flash streamer technology has been proven to deliver over 1,000 times faster purification.

Daikin is now researching how to apply this streamer discharge technology to refrigerated container units to combat issues encountered with the growth of fungus, mould and bacteria on fresh produce during long-distance transport.



In tests, fungus was placed on electrodes of the streamer discharge unit and the irradiated streamer was discharged for 15 minutes. These photographs, taken with an electron microscope, show the fungus before (above) and after 24 hours where 99.9% has been removed (below)



Customer focus

“K” Line upholds service traditions



Established as Kawasaki Kisen Kaisha Ltd in 1919, Japanese-headquartered “K” Line is today a diversified shipping, transport and logistics provider active around the world in the container, automotive, dry bulk, energy and heavy lift markets.

Container transport services are “K” Line’s core business, with a fleet of 75 ships plying the international waters as of March 2013. Having taken delivery of 13 new 8,000TEU class vessels between 2005 and 2012, “K” Line is now investing further in fleet upgrades, with five new, ultra-large

“K” Line is one of Daikin’s longest-established customers

14,000TEU ships due for delivery in 2015.

Although it operates mainly on East-West routes, including Asia-North America, Asia-North Europe and Asia-Med, the company also provides intra-Asian services covering the Middle East and the Indian subcontinent, plus South-North sailings linking South America, Australia and Africa with Asia and other regions.

Alliances are an important part of “K” Line’s strategy

to maintain a high level of sailing frequency and service reliability. This includes the CKYH Green Alliance, established 2001 with Chinese operator COSCO, Yang Ming of Taiwan and South Korea’s Hanjin Shipping, which cooperates on main East-West routes and other trades.

Investment in container service infrastructure and equipment is also at the heart of the “K” Line approach. This includes own container terminals in Japan, the USA and Europe, a container fleet of dry freight, refrigerated and specialist containers, and an extensive double-stack train (DST) operation in North America.

In North America, “K” Line provides multiple weekly fixed-day sailings between the Pacific Northwest and Southwest and the Pacific Rim, plus weekly fixed day sailings between Europe and the US East Coast. All of its shipping services connect directly to the company’s exclusive double-stack train network, covering the USA and Canada. The company is a one of the pioneers in this market, having launched its first DST service back in 1986.

“K” Line is one of Daikin’s largest and longest-established customers, using Daikin container refrigeration machines for more than 45 years. The high reliability of Daikin machines has been an important factor in this long-standing relationship, especially to meet the needs of “K” Line’s extensive DST operation.

Long-distance rail transport of reefer containers is more challenging than shipment by ocean. Machines are constantly subjected to vibration and impact forces and cannot be repaired while they are on the move. Equipment must therefore be very robust and trusted to operate reliably in these difficult conditions.

“We are very satisfied with the performance of our Daikin machines for railway transportation,” confirms a “K” Line spokesperson.

Long-distance rail journeys are particularly challenging for reefers, due to greater vibration and impact forces. Daikin’s machines have proved robust and reliable



Customer focus

Dole Asia gets Zestia

Dole Asia has invested in 400 new Zestia units

Dole Asia Holdings Pte Ltd has recently invested in its first ever Zestia units. The Singapore-based fruit company, which has been a part of Japan’s ITOCHU Corporation since April 2013, will take delivery later this year of 400 new 40ft hi-cube reefer containers fitted with the Zestia inverter compressor machines.

The new equipment is being supplied through Cronos Containers, with reefer boxes built in China by the Shanghai CIMC Reefer Container Company Ltd. Cronos, one of the world’s largest container owners and leasing companies, has been an important supporter of Zestia

Dole Asia has been using Daikin reefer technology since 2009 and already operates 100 reefers fitted with the LXE scroll compressor model

over the past two years. Its previous investments include the acquisition of Zestia units for new reefer containers supplied to Japanese carrier MOL. This latest project marks another important milestone for Daikin’s premium, low-power,

high-performance reefer container machine, and a further strengthening of the relationship with Cronos Containers.

Dole Asia has been using Daikin reefer technology since 2009

Zestia’s energy-saving potential is due to the use of DC inverter compressor technology

and already operates 100 reefer containers fitted with the LXE scroll compressor model. The company will be using its new Zestia inverter compressor reefers for fresh produce exports, including bananas and pineapples, from the Philippines to South East Asia and Oceania.

Zestia’s energy-saving potential is due to the use of DC inverter compressor technology, which also has

environmental benefits and other advanced design features. The unit’s low power consumption will enable the fruit shipper to reduce operating costs today and for the future without compromising on premium cargo care.





As part of our promotion and education campaign to the resale market, Daikin recently ran tests for two reefer container sales agents on the US West Coast who were keen to know more about reducing power consumption

Resale market

Successful result for DTMS II power-saving software in the resale market

Recent tests showed that Daikin’s DTMS II power-saving software can significantly reduce power consumption on older LXE10E units

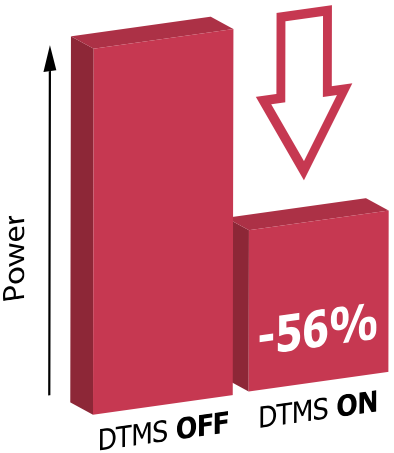
Daikin launched the LXE10E scroll compressor series 12 years ago and today these units are increasingly seen in the resale market. As part of Daikin’s promotion and education campaign to the resale market, we recently conducted tests with the DTMSII power-saving software for two reefer container sales agents on the US West Coast who were keen to know more about reducing power consumption.

The tests involved a power consumption comparison using two LXE10E units, both built in late 2002. Each unit was run continuously for one week with DTMSII OFF and then for another week with DTMS II ON. The results revealed a 56% power saving using DTMSII for one unit operating in the chilled mode and a 19% saving for the second unit tested in the frozen mode. The trials demonstrated that clients in the resale market can reduce their energy costs and usage simply by uploading the DTMSII software to their older LXE10E units.

Results showed a 56% power saving using DTMSII for one unit operating in chilled mode, and a 19% saving for a second unit tested in frozen mode

Note: power consumption is influenced both by machine condition and heat load (box size and condition, ambient condition and cargo heat load etc.) Therefore, power reduction results will not always be the same. The DTMSII software can be uploaded to the Daikin scroll compressor machine.

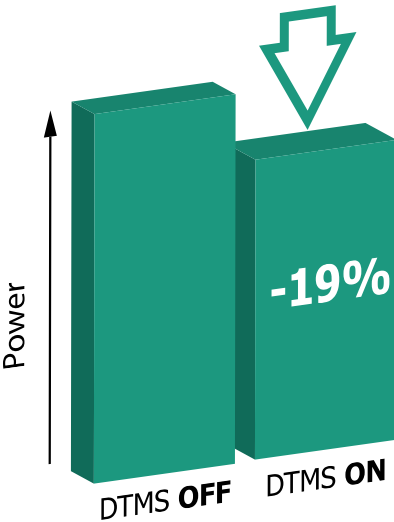
Company A



Model: LXE10EA-14
Manufactured: Dec 2002
Size: 20 feet

Result: 56% less with DTMS II on in chilled mode

Company B



Model: LXE10EA-14
Manufactured: Dec 2002
Size: 20 feet
Set point: -18°C
Fresh air open: 0%

Result: 19% less with DTMS II on in frozen mode

Service update

Truck transport provide swifter service for Brazil

Successful trials with road transport have slashed lead times for delivery of spare parts into Brazil from Daikin's dedicated spare parts distribution centre in Uruguay

Since opening its own spare parts distribution centre in Montevideo, Uruguay, around one year ago, Daikin has continued to explore new procedures and processes to provide better service for customers across South America. Most recently, the focus has been on how to improve service to clients in Brazil, one of the continent's most important reefer trade markets, with year-round business in the export of beef, pork and poultry, as well as fruit and processed foods.

"Brazil is a highly strategic country for our after sales operations," says Alvaro Quintana, After Sales Service Manager for the Americas region. "The country has a number of very important ports for reefer business, such as Santos and Itajai, where our valued ocean carrier customers call regularly. Smooth and quick delivery of spare parts to our authorized repairers in Brazil is vital to ensure that these clients are well served."

Recently, the focus has been on improving service to clients in Brazil, one of the continent's most important reefer trade markets

Until recently, spare parts have been shipped to Brazil by sea, leaving from the Port of Montevideo and arriving via the Port of Santos. But while the sea leg of this journey takes just 4 days, it has not been uncommon for the total delivery cycle to be up to four weeks. Alvaro Quintana explains why: "Customs clearance in the Port of Santos takes around three weeks in the worst case and on top of that, there are often some additional days waiting for shipments to be loaded in the port of Montevideo. As a result, lead time via ocean is often one month."

Recognising the need to shorten the lead time, the team at the Daikin Americas Reefer Parts Operations Centre decided to try out truck delivery as a possible alternative. Two trial shipments were carried out with Termobrastec Comercio e Servicos Ltda, one of Daikin's authorized service dealers in Brazil. The results were outstanding.

"The trials with Termobrastec demonstrated that we can deliver spare parts in just five days door-to-door when we go by road," says Lisa Wiedeman, Operations Coordinator at the Daikin Americas Reefer Parts Operations Centre. "This means we can reduce the total lead time from Montevideo to Brazil by 82% compared with ocean shipment." Ms Wiedeman continues: "Smooth customs clearance on the border is the key to the new operation. We've got the know-how to manage this with perfect preparation of import documents and close communication with our clients and trucking company."

"We realized the stock improvements that Daikin had made with its Montevideo warehouse, but were concerned about the long lead time from Uruguay to Brazil," says Shin Kimura, Operation Director of MOL (Brasil) Ltda, the Brazilian arm of Japanese container carrier MOL Liner. "The five-day delivery via truck will change the situation dramatically and help our operations very much. We hope that Daikin will cooperate closely with the repairers in Brazil and make the new delivery method standard."

Adds Akira Fujimoto, Assistant Manager at Daikin Reefer After Sales: "Now we are ready to provide better distribution to Brazil and we have already shared the result of these very successful truck delivery trials with all of our authorized repairers across the country."



"The five-day delivery via truck will help our operations very much." -Shin Kimura, Operation Director, MOL (Brasil) Ltda



Everything points to a bright future for reefer trade across Russia and Daikin will work hard to support customers and colleagues in this growing market

Market update

To Russia with love

Daikin Reefer team members visited Russia in July to provide training, meet customers and partners, and learn about reefer business in this vast country

Russia is one of the fastest growing economies in Europe. It is also highly dependent on food imports to satisfy the demanding appetites of its large middle class consumer base. The Russian middle class population currently stands at 104 million people, out of a total of 143 million, and is forecast to rise another 16 per cent by 2020. The decision this July by the World Trade Organisation (WTO) to accept Russia after 18 long years of negotiations is expected to give a further boost to its international

trade in food and drinks, reducing tariffs and lifting restrictions on agricultural imports for a larger number of countries looking to do business in this huge country.

All of this is good news for the reefer container transport and logistics sector, both domestic and international, as members of the Daikin Reefer team discovered on a recent training and business development mission to Russia.

Today, the Russian reefer container market can be divided into a number

of distinct, complementary segments. Shipping lines, rail transport operators, road haulage companies, service

A high percentage of cargo flows from west to east, and vice versa, along the Trans-Siberian Railway, the longest railway in the world

providers and equipment supply and sales companies all play an important role. This includes diversified

intermodal transport and logistics organisations such as Moscow-based FESCO Transportation Group. FESCO, which started life in 1880, is now a large, integrated private company providing maritime, rail and road transport, stevedore and terminal services, with investments in vessels, rolling stock, road trailers and containers. It has a very active presence in the reefer container market.

Inside Russia, a high percentage of cargo flows from west to east, and vice versa, along the Trans-Siberian Railway (TSR), the longest railway in the world at 9,289 km (5,772 mi). RZD, the Russian Railways, recently announced plans to invest up to \$6 billion in TSR developments by 2020. Container traffic on the TSR has been growing fast, with volumes doubling in just three years since 2009 to reach 238,200TEU in 2012. Earlier this year, RZD launched a new regular express container service linking Vostochny-Nakhodka in the Russian Far East with Moscow in just seven days.

Everything points to a bright future for reefer trade across Russia and Daikin Reefer will continue working hard to provide our customers and colleagues in this growing – and very demanding – market with education, training and after-sales support.

Fifteen people attended the first training seminar in St Petersburg, representing a mix of experienced engineers and trainees

Training report

During our July 2013 visit to Russia, Daikin Field Service Manager Richard Boshuijer provided technical

Over 60 Russian guests attended our three ‘touch and feel’ seminars in St Petersburg, Vladivostok and Moscow

training seminars about the LXE10E scroll compressor machine at three different locations: St Petersburg, the cultural capital of Russia; Vladivostok, the country’s largest Pacific Ocean port; and capital city Moscow.

In total, over 60 Russian guests attended the three seminars, representing companies such as

Vladreftrans, Pacific Intermodal Container, Bimicon, RefTechService, Container Leasing, FESCO, Petrolesport, Kamchatka Line and VKT. Participants had the chance to ‘touch and feel’ the LXE10E machine during half-day practical presentations in front of a unit, and to quiz Daikin representatives about spare parts, technical operation and maintenance issues. The attendees

VladRefTrans reports, “We respect Daikin’s production standards and quality control system and enjoy the reliability of Daikin’s units”

were a combination of engineers, trainees and sales/commercial people, with each engineer receiving



a Daikin certificate. The seminars were very fruitful and Daikin received a lot of positive feedback both on the quality of training and the guests' previous experience with Daikin Reefer technology.

Daikin reefer team feedback

"Our recent stay in Russia confirmed that this is a very tough market for operating and maintaining reefer containers. Climate conditions are extreme, long distance transport by rail puts a lot of stress on equipment, and there is a huge territory to cover in providing parts and service support. It's very important for us to continue learning more about the operational challenges that face our customers and partners in Russia and ensure that we have a strong supply route in place for our products and parts."

Message from Transtec

"Daikin is a recognized brand in Russia, not only as a producer of air conditioners but also as a supplier of reliable units for reefer containers, which deliver fresh and consistently high quality food to our tables. It is well known that operating conditions for reefer containers in Russia are some of the most difficult in the world. Ambient temperature within one trip can be from range from +20°C to -45°C on west-east routes and from -25°C to +50°C on north-south routes.

We're pleased to see Daikin's strong interest in the Russian market and glad to report that we have started tests with the first two Zestia units to be used in our country. The recent T&F and Technical Seminars in Moscow, St Petersburg and Vladivostok have been a great chance for Russian reefer engineers to get better acquainted with the Daikin reefer units."

Message from VladRefTrans

"LLC VladRefTrans has been cooperating with Daikin for the last seven years. In that time, we have established good, friendly relations between our companies and our staff members. We respect Daikin's production standards and quality control system and enjoy the reliability of the Daikin units, as well as the high qualifications of its staff. Daikin engineers and managers are always attentive to each issue or request. We would like to thank Daikin Europe and Itochu Russia offices for the high level technical support provided and for arranging training seminars in Russia. We wish your company and all your staff success and prosperity and look forward to further fruitful cooperation."

A A Konenko, General Director, and V G Zinoven, Head of Engineering Department, LLC VladRefTrans

Around the world of Daikin

Conveni-Pack and ZEAS help commercial and industrial customers use energy wisely

Environmentally friendly and energy efficient are the key watchwords for the commercial and industrial refrigeration industry today, and Daikin is at the forefront in providing new technologies to meet market demands.

Launched in 2006 and since expanded and upgraded, the award-winning Conveni-pack range has become a flagship of Daikin's commercial

From the farm to the table, Daikin is everywhere near you



The Total convenience garage forecourt store in Cambre, Belgium, uses Daikin's environmentally-friendly Conveni-pack refrigeration system

refrigeration range in Europe. Adopted by several well-known supermarket chains, including Aldi and The Co-operative Group, the system offers a uniquely integrated approach to refrigeration, air conditioning and heating for food retailers and pharmacies, by recovering up to 100% of the exhaust heat from refrigerated cabinets and freezers and re-using it to heat store space at no additional cost. Conveni-pack also works 'in reverse' to deliver cool chilled air throughout the store.

Based on DC inverter compressor technology and running on low GWP refrigerant R-410, Conveni-pack reduces energy consumption and emissions by up to 50% compared to traditional, non-integrated systems. The compact, low noise design has proved popular with supermarkets and smaller convenience stores alike.

Launched in 2010 for industrial and commercial users with fluctuating loads and high energy efficiency requirements – such as cold stores, supermarkets,

breweries, butchers and food processing factories – the DC inverter-based ZEAS refrigeration condensing units combine reliable performance with low operating costs and low noise.

The ZEAS Series-B design, introduced earlier this year, combines chilling and freezing capabilities in one compact unit for indoor or outdoor installation. ZEAS's low noise levels mean that units can be installed outdoors in built-up areas without disturbing residents, making it an ideal solution for small local retailers as well as larger users.

From the farm to the table, Daikin is everywhere near you.



Our second seminar in Vladivostok welcomed a mix of engineers and sales/commercial people. The local sales/commercial representatives used this opportunity to enhance their knowledge and to get detailed information about Daikin's products

Intermodal Europe

Daikin meets the market in Hamburg this October

The Daikin team will be out in force again at Intermodal Europe, taking place 8-10 October 2013 at the Hamburg Messe. Now in its 37th year, Intermodal Europe is the leading container transport and logistics event and is widely recognized as the must-attend event for container logistics professionals.

Daikin has been exhibiting at Intermodal Europe since 1997 with great success and we are pleased to welcome more customers and partners to our stand every year. If you plan on visiting the show this year, please drop by our stand D12 to see us.

What will you see on our stand this year?

At this year's Intermodal Europe, we will introduce Daikin's controlled atmosphere technology, which will be available for our customers in the near future, as well as our streamer technology, already well-proven in the air purifier field and now under consideration for use in reefer machines.

Visitors will have chance to 'touch and feel' the latest Zestia and LXE machines, both offering low power consumption and user-friendly interfaces for easy operation and maintenance. Visit us to find out more about what's in store for the future!

We look forward to seeing many of our customers and business partners at Intermodal Europe this October on Daikin stand number D12.

www.intermodal-events.com



Daikin people



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"Hello. My name is Harm Louwen and I joined Daikin's team in Rotterdam on 1 April this year as a Technical Sales Engineer for the Europe, Middle East and Africa region. Prior to that, I worked for Smith Holland, a very well-known reefer service company here in the Netherlands. I was with Smith Holland for over 16 years, working as an engineer as part of their service centre team. I am 44 years old, happily married for almost 23 years and we have three children – two sons and a daughter. I have already experienced Daikin as a warm and welcoming company and I am looking forward to what the future will bring!"