

20/40

A publication for the seagoing container transport temperature control industry.

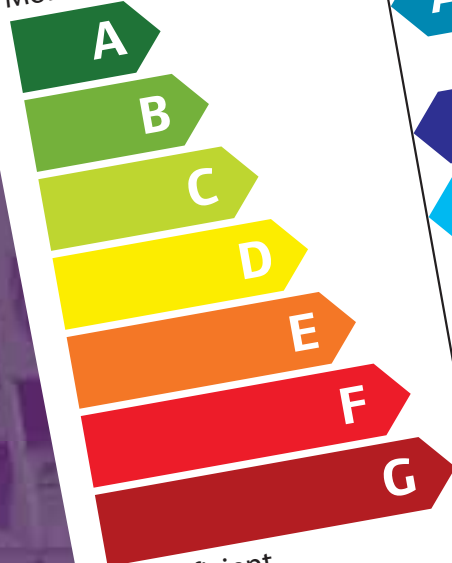
Winter 2006/07

MAGNUM[®] Continues to Outperform the Competition

**Efficiency, Power
Consumption, Pulldown,
Environmental Impact,
Performance**

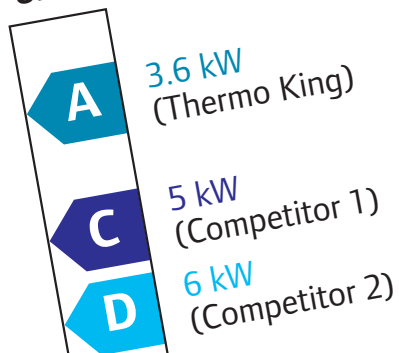
Energy

More efficient



Less efficient

Container Units



Power consumption continues to be a key factor in Thermo King's MAGNUM[®] container refrigeration unit's growing popularity within the container industry. Fuel prices remain a challenge for everyone's bottom line and the MAGNUM unit softens the expense by providing significant savings for fleets compared to competitive products available. Yet that savings in power does not affect the MAGNUM unit's amazing pulldown capabilities (see page 3) or the reefer's respect for the environment (see Global Warming article on page 4). These are some of the many reasons why the MAGNUM unit is being chosen by shippers of frozen and fresh products alike. Read about a couple new customers in this issue (Young Brothers on page 6 and Dongnama Shipping of Korea on page 2), as well as an existing customer who is utilizing the MAGNUM unit in its refrigerated business expansion efforts (CCNI on page 7).

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THERMO KING

World Leader in Transport Temperature Control

South Korean Fleet Chooses MAGNUM®

C&Container Leasing Co., LTD (C&CL) and Dongnama Shipping, both members of the South Korean-based C& Group Company, have chosen Thermo King's MAGNUM® container unit in a recent order of reefers. C&CL has purchased the units and is leasing them to Dongnama Shipping for placement in its fleet. Ace Magnum Korea Co., Ltd. was the Thermo King agent company that transacted the MAGNUM unit purchase, which is the first in Korea.

Dongnama Shipping currently operates a fleet of 40,492 units, 6,688 of which are leased from C&CL. They specialize in reefer container transport and run routes from India to Japan. The MAGNUM units were chosen to improve customer service quality.

Mr. Hak-Kyun Oh, CEO of C&CL made the decision to purchase the MAGNUM units for C&CL's recent order. "We think that the MAGNUM unit's quality is best among its competitors. It allows us to easily meet our customers' requests for superior reefer unit performance."

As one of the C& Group member companies, C&CL was established in 2000. The company is engaged in various leasing activities of container and chassis such as operating lease, Lease & Purchase, and Sales and Lease Back. C&CL is handling various container types primarily for Korean and Chinese shipping companies and ferry operators. C&CL has recently initiated a major investment program to renew and expand its own fleet of containers and chassis with an investment of more than \$1 billion over the next three to four years.

"Thermo King is delighted to have received this first order from C&CL for the Dongnama Shipping fleet," said Dennis Trusler, director, container sales, Asia Pacific. "This is the first time



Dongnama has chosen Thermo King's MAGNUM unit, and we wish Dongnama every success in operating these new units. We are confident that there will be more MAGNUM unit orders to follow during 2007."

The Ace Magnum Korea Co. was established on July 1, 2006, as a special sales representative of Thermo King MAGNUM units in Korea. Parent company Ace Engineering & Co., Ltd., supplies hundreds of specialty reefer containers worldwide and since a 2004 trial, has been recommending the MAGNUM unit to customers needing exact temperature control.

"Ace Magnum Korea Co. representatives are proud of the MAGNUM unit's distinguished function, and we believe that the demand for this technology will continue to grow in Korea," said D.J. Park, director, Ace Magnum Korea Co.



The Benefits of Fast Pull Down



Most people in the shipping industry can identify the five parameters that matter most to any respiring perishable commodity: temperature, temperature, temperature, humidity and atmosphere. And that is no typo. If the temperature is not correct, the other factors do not really matter.

It is well-accepted that the shelf life of any commodity is enhanced by carrying it at its correct temperature. Time spent at the wrong temperature shortens the shelf life considerably, and there's no way to recover that lost time. So it is important that the cargo is brought to, and maintained at, the correct temperature as quickly as possible. Unfortunately, despite everybody's best intentions, cargoes are not always loaded at the correct carrying temperature. This can occur when there is no access to a stationary cooler to remove field heat. As a result, the cargo is loaded hot into the container.

While it is not intended to have reefers pull down the temperature of hot cargoes, Thermo King's MAGNUM® unit is better equipped than any other reefer to do so if needed. This is most commonly seen with banana loads. Operators consistently see warm loads of bananas pull down to set point within two days after loading the produce into a MAGNUM-equipped container. This is 50 percent faster than a traditional R134a reefer can perform.

The MAGNUM unit is the most powerful reefer on the market today. The secret is in the combination of digital scroll compressor technology with R404A refrigerant. R404A is by far the most widely used refrigerant for transport worldwide. It is the global standard in all over-the-road trailer refrigeration units, from every manufacturer, due to its wide temperature capabilities, and associated efficiency.

One suggested way to try to offset R134a's poorer pull-down is to increase airflow. This is doubly detrimental: more fan power puts more heat into the box, wasting energy, and on fresh respiring cargoes more dehydration occurs, leading to greater weight loss. Ultimately, it doesn't work, but does cost more energy, AND causes deterioration to fresh respiring cargoes.

As the MAGNUM unit provides the most refrigeration capacity available today, at every temperature, it pulls down to set point faster than any other equipment. Faster pull down means more time at set point (consuming the least amount of power), resulting in extended shelf life and greater profitability ... the end result everyone is hoping to achieve.

Fuel for Thought ...

When it comes to fuel efficiencies, which are on every operator's mind these days, Thermo King wins – with the MAGNUM® container unit and its genset product line. If a Thermo King clip-on genset is run with a 125-gallon fuel tank powering a MAGNUM® unit, it will run a full DAY longer before refueling is necessary compared to the same MAGNUM unit being powered by a competitive genset with the same size fuel tank. Side by side laboratory tests consistently confirm this. How much is a day of fuel worth to you?



MAGNUM®:

The Other Word for Green

By Dr. Dermott Crombie

Vice President, Global Marine Solutions



The annual energy savings of a MAGNUM container unit reduce CO₂ emissions equivalent to the planting of one hectare (more than two acres) of trees. It also saves NO_x and SO₄ emissions, AND saves you money!

Governments in Europe (and elsewhere) are now very seriously pursuing a strategy of reducing CO₂ emissions. There are several ways to do this. Some are switching to cleaner fuels, such as gas instead of oil for electricity generation. Many countries are investing heavily in wind power, and some in solar, to supplement hydro-electric power. And the whole debate on nuclear power has begun again.

Many large corporations have an environmental mission statement, or vision, to reduce their environmental footprint. This ranges from use of more efficient lighting in supermarkets to hybrid or fuel cell public transport, and tax structures are appearing to encourage such activities.

In the marine transport sector, the use of low-sulphur fuel is encouraged, and cold-ironing is required in some ports, all with a view to reducing emissions.

With 90 percent of the cost of a container vessel voyage consumed in oil costs, savings opportunities can be critical. The continued high price of oil (still hovering around \$60/bbl) suggests the cost of fossil fuel energy will not come down any time soon. When Thermo King launched the MAGNUM® container reefer just three years ago, oil was trading at \$26/bbl. At that time, the energy savings of the MAGNUM unit were very interesting. Today, they are vital. More prudent use of oil is key to reducing emissions, reducing the environmental footprint, and, coincidentally, saving money too.

The question of conservation has a major part to play. Firmly enforcing the UK's 70MPH vehicle speed limit has projected savings of 4m tonnes of CO₂ emissions annually. It would also save significant emissions of other pollutants AND save money. Clearly, conservation is the smartest way to go, all other factors being equal.

Thermo King has been pursuing a strategy of technological responses to environmental issues for more than 15 years in the Marine sector. As far back as 1997, Thermo King described how reducing energy consumption in the reefer contributed to a direct reduction in global warming emissions, by reducing the consumption of fossil fuels, and thus the emission of CO₂. Today, that message remains the same, but now the spiraling cost of fuel oil makes this a compelling economic answer as well.

Put simply, the most abundant manmade contributor to global warming is the emission of CO₂ produced by the burning of fossil fuels. A MAGNUM container refrigeration unit can save between 4,900 to 7,250 kW-Hr of energy a year, compared to competitors' units. The production of 7,250 kW-Hr of electricity by a national grid will produce 7,250 kg CO₂, along with 16 kg of NO_x and 30 kg of SO₄. This quantity of CO₂ is the same as would be absorbed by the planting of more than two acres of trees or almost one hectare!

Just 107 MAGNUM units have the same impact as planting a square kilometre of trees. The same quantity of units would also save the release of one tonne of NO_x and three tonnes of SO₄. You can see how quickly this mounts up.

What is most important to note is that these energy efficiencies are achieved without compromising the cargo safety. While the MAGNUM unit has the lowest energy consumption of any commercially available reefer in the market, it also has the highest capacity, the fastest pulldown, the finest temperature control, with or without fresh air ventilation, all packaged in the industry's lightest machine!

Peruvian Snow Peas

AFAM+ Trial a Success

Peruvian exports continue to benefit from Thermo King's Advanced Fresh Air Management System (AFAM+). Our Summer 2006 edition of 20/40 featured an AFAM+ success story about Peruvian avocado exports into Europe. After the latest AFAM+ trial, it confirms that Peruvian snow pea exports can successfully utilize this technology as well.

Approximately 350 containers of snow peas and sugar snaps were shipped out of Peru in 2005, the majority using controlled atmosphere (CA) technology. With the export market expected to grow considerably this year, shippers are looking for other options to keep their product in top condition. Thermo King's AFAM+ became that option after customer AVSA (Agricola Vinasol Sociedad Anonima), a large Peruvian company dedicated to peas and asparagus export to Europe and the USA, successfully trialed the technology during a nearly 20 day voyage to the USA.

The trial began in Callao, Peru, on October 7, when 20 pallets of Agricola Vinasol's snow peas and sugar snaps were loaded into a reefer container that was cooled by a Thermo King CRR reefer and was equipped with an AFAM+ system. The temperature set point of 0 degrees C was reached immediately and the CO₂ set point of 3 percent was reached about 12 hours after the unit began operation. As per the desired set points, the container recorded an average air temperature of 0.3 degrees C and 4 percent CO₂ levels throughout the voyage, despite passing through ambient air temperatures of 25-30 degrees C, until arrival in Port Everglades in Pompano Beach, Florida on October 24.

After opening, the container unit and cargo pallet temperatures measured from 1.1 to 1.6 degrees C. The snow peas were inspected for defects, size, count and weight, and packaging. The receivers and the surveyors agreed that the peas were firm, of good quality and ready to eat.

"The outturn report and condition of the peas after this trial showed that the complete voyage was perfect," said Gino Ansaldo, Thermo King sales & service manager, South America. "All participants were pleased with the outcome of this test as it proves that AFAM+ is a viable option in the transport of snow peas. More importantly, it provides the Peruvian export market with real options for a growing industry that serves destination ports of Miami, Port Everglades and New York."



News Notable ...

The recently published **Sterns Report (October 30, 2006) to the British Government points to looming environmental (and economic) disaster if global warming emissions are not drastically reduced soon.** Sir Nicholas Sterns, a distinguished development economist and former chief economist at the World Bank, has reviewed all the data currently available, and has delivered a clear

warning saying, "our actions over the coming few decades could create risks of major disruption to economic and social activity, later in this century and in the next, on a scale similar to those associated with the great wars and economic depression of the first half of the 20th Century."

Sterns believes a 5-6 degree climate warming is a "real possibility" for the next century and that real investments need

to be made to aim for the stabilization of greenhouse gas levels in the atmosphere. The biggest challenge will be the collective, coordinated action – and action consensus – by most of the world's governments, as to which countries will take the majority of financial responsibility in emission reduction efforts.

"Lifeline of the Hawaiian Islands" Chooses MAGNUM®



Power consumption test results and advanced technology seal the deal

For over 100 years, Young Brothers has been serving the people of Hawaii with inter-island freight transportation. Beginning with transportation services between Oahu and Molokai, the company has grown to offer fast, frequent and reliable service to seven ports throughout the Islands.

As the only common carrier authorized by the State of Hawaii to transport goods over water (by barge) from one island to another, Young Brothers takes its services seriously. The company takes great pride in its dedicated and skilled employees and its fleet of tugs and barges and cargo-handling equipment. So when the company was looking to expand its refrigerated container fleet, it turned to Thermo King.

"Young Brothers was interested in the MAGNUM® unit, but wanted to conduct a side-by-side power consumption comparison between it and a competitive reefer first," said Nora Beckjord, sales director, Americas, Thermo King Global Marine Solutions. "So on January 4, 2006, Mike Stark, Thermo King service and parts manager, helped them set up a 22-hour test between the Thermo King MAGNUM reefer and a competitor's reefer. Both were mounted on Young Brothers-owned containers. The MAGNUM unit went on a Jindo 1998 container, and the other reefer went on a Yangzhou 2003 container. Both thermostats were set at 38 degrees F."

The test results spoke for themselves. At the end of the 22-hour test, the MAGNUM unit had consumed 69.32 kW-Hr of energy. The competitor's reefer consumed more than 70 percent more with 119.51 kW-Hr of energy. Based on this test, the cost per day to run the MAGNUM unit was \$6.05 while the competitor was \$10.43, using a cost of energy averaged at 8 cents per hour. Running the MAGNUM unit 2,700 hours per year would cost \$680.60; the competitor would cost \$1,173.37.

"Assuming that the units run were representative of other units in the Young Brothers fleet, that annual \$492.77 savings grows enormously when multiplied by the total number of reefers in its container fleet," explained Beckjord. "Young Brothers quickly saw the MAGNUM unit's cost-savings benefits and decided to add MAGNUM units to its container reefer fleet. Delivery is expected before the end of this year."

Young Brothers currently operates a fleet of approximately 500 reefer units. The MAGNUM unit order is the first purchase from Thermo King since 1998. The company is projecting to double their business between now and 2010.

"With the rising price of fuel in the last year and half, we strive to look at ways to improve efficiency and reduce cost. With the increase in volume of reefer units moved through our system, the savings by converting to MAGNUM units will be significant," said Vic Angoco, Young Brothers' senior vice president.

Founded by Herbert, William and Jack Young, the Young Brothers company was incorporated in 1913. It got its start by providing ocean transportation services between Oahu and Molokai. Later, Hawaiian Tug & Barge was formed as a sister company to separate harbor operations and charter activities from Young Brothers' inter-island freight operations. In 1999, Saltchuk Resources, Inc. of Seattle, Washington, acquired Young Brothers and selected assets of Hawaiian Tug & Barge from Hawaiian Electric Industries. Together, Young Brothers and Hawaiian Tug & Barge operate 10 barges and 12 tugs and service a full spectrum of cargo from one carton through an entire barge load.

More information on the company can be found at www.youngbrothershawaii.com.

1,000 Additional MAGNUM® Units Ordered by CCNI

Expanded refrigeration fleet will be ready for Chilean Season end of 2006.

Thermo King MAGNUM® units are helping Chile-based CCNI develop and open new reefer market opportunities that will fill three new transport vessels, all of which were inaugurated in 2006. The company purchased 1,300 MAGNUM units in 2005 to satisfy the growing demand of Chilean salmon shippers for this advanced technology, which is built to carry all temperature ranges including the unique -35 degree set point capability. CCNI's latest order for 1,000 new MAGNUM units (through Carlisle Leasing) will contribute to the company's extraordinary service to South American exporters.

"These units are directly impacting CCNI's success on the West Coast of South America," said Gino Ansaldo, Thermo King sales & service manager, South America. "The company's refrigerated container transport capacity has increased tremendously this year with the addition of the CCNI Antillanca (February 2006), the CCNI Arica (June 2006) and the CCNI Antofagasta (September 2006). Those ships, stocked with MAGNUM-powered reefers are used for Chilean exports and will benefit both fresh and frozen transport for Chilean products, as well as Ecuadorian bananas, Peruvian frozen fish and others."

MAGNUM units consume much less power over a typical operating range than competing technologies, and offers superior capacity in the frozen ranges and higher pull-down capacity for quick recovery and temperature reduction in the chill range.

"The MAGNUM unit has supported our growth efforts, giving us the opportunity to penetrate new accounts in the Commercial Area, as well as in Cargo Care," said Ricardo Spuhr, CCNI vice president Containers Logistics. "The unit's energy, fuel savings and cold temperature capabilities have made this possible. We continue to expand our reefer fleet with Thermo King because of this remarkable technology and the excellent service we receive around the world; it allows us to differentiate ourselves from the always-demanding shipping business scenario."

For more information on the Thermo King MAGNUM unit and its fuel savings potential, check out www.scientificshipper.com and read issue 10 about the real cost of power when running containers and how much the MAGNUM unit can save shippers.





Soaring Metal Prices Affecting Industry

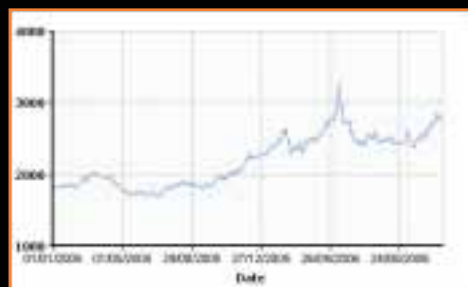
Fuel prices are not the only concerns affecting our industry these days. Rising metal prices are leaving a painful bite mark in business profits. "Copper is up nearly 300 percent, almost doubling this year alone, and aluminum is up almost 40 percent over one year ago," said Gerry Moore, director supply management, Ingersoll Rand Climate Control Technologies (European Served Area). "Our entire industry uses both of these metals and, unfortunately the prices of these metals has remained consistently high in the second half of the year affecting us all."

These rising commodity costs are attributed to China's consumption of raw materials and speculation. According to a recent article in Bloomberg News by Simon Casey, China, the

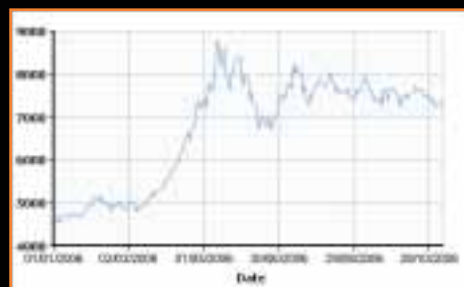
world's fastest growing economy, has become the biggest user of copper and zinc as it constructs more apartments, factories and roads. General consensus from the experts is that prices for all base metals are expected to remain above historical 'normal' levels through the end of this decade.

For reefer manufacturers, it means approximately a \$500 per unit increase in manufacturing. "With no significant price decreases being speculated for the near future, it's likely we'll have to pass along some of the expense to customers; there's just no way around it," continued Gerry. "For now, we, like others in our industry, will continue watching this story unfold to determine the steps that need to be taken to counteract these price increases."

Aluminum



Copper



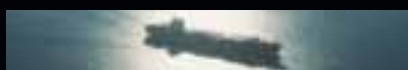
Temperature Management vs. Energy Savings

Shipping lines continue to focus on the commercial and environmental costs of the energy they consume, which has them trying to address older technology power-hungry equipment with software fixes. There is nothing new in control techniques in recent years; rather all the recent advances have been from new hardware,

whether it be compressors, coils, application of the right refrigerants, and so on. Saving energy by installing new software raises new questions. What is being compromised in the cargo care? Is it airflow? Is it temperature control? Particularly for chill cargo, where temperature control is most critical, it goes without saying that the reefer has to remain running in every respect.



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