

# Tankcontainer

## MAGAZINE

Volume 1 | Issue 3 | September 2014

**CIMC's Liu Chunfeng reveals  
how the Chinese company  
became a world leader in  
tank container manufacturing  
in just 12 years**



**Also in this issue: Asia Focus – Manufacturers – Chemicals – Lessors**



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# All change in the land of opportunity

Following the geographical focus on Europe and the Middle East in the first two issues of *Tank Container Magazine*, we look at the tank container opportunities in Asia (the next issue will focus on North America).

Inevitably, China dominates in term of scale and opportunity. However, it is also uniquely complex.

In terms of scale, if China's \$9,240 billion economy achieves its target growth of 7% in 2014, GDP will have grown by \$643 billion – equivalent to the entire GDP of Switzerland or 80% that of Saudi Arabia. We explore this in a special feature in this issue.

China is now the largest market for chemicals in the world, with a disproportionately large volume of specialty chemical imports. Many of these are imported in tank containers.

China's chemical production is undergoing a period of massive expansion and change. However, this expansion is less than its anticipated demand growth, ensuring a long-term, structural dependency on imported polymers and specialty chemicals.

The nature of the raw materials China uses for its chemical production is also going through radical change – new process technology is unlocking the potential of indigenous coal as a chemical feedstock, instead of imported oil and gas-based feedstocks. This enables China to leverage its considerable coal reserves – the third largest in the world – while reducing its dependency of imported oil and gas feedstocks.

China is already by far the largest coal producer in the world – producing nearly four times that of the second-placed US – and depends on it for 70% of its energy. However, small-scale, coal-to-oil and coal-to-gas projects are being banned by the National Energy Administration following recent “irrational development”; larger projects will need approval from the State Council, China's cabinet.

In terms of opportunity, the new coal-to-chemical processes will produce millions of tonnes of specialty chemicals, such as butanediol (BDO). These will need to be moved in small, bulk lots due to the lack of pipeline networks in the major coal-producing regions – one

project alone requires 1,200 tank containers.

Now comes the complexity. The intermodal infrastructure is well-developed in the main coastal clusters, but its effectiveness for moving dangerous goods rapidly diminishes inland. The ability to exploit rail is a key strategic priority and the new National Railway Bureau will be responsible for introducing far more explicit regulations covering the movement of dangerous goods, and, for the first time, there will be specific regulations for tank containers.

Congestion is frequently endemic in the region, with many key ports having an inadequate number of berths. This increases operational costs, as freight rates typically rise to compensate for delays and demurrage costs.

China's financial interest in tank containers is developing on several fronts, including involvement in operating, leasing and manufacturing equipment.

Lastly, China is by far the largest tank container manufacturer in the world. CIMC, the largest tank container manufacturer in the world with revenues of \$530 million in 2013 is a proto-typical Chinese success story. The company first started manufacturing tank containers in 2001 and now, just over a decade later, produces approximately half of all the tank containers manufactured in the world. Its R&D division is vibrant with a strong pipeline of innovative products designed for customer-specific and market-specific needs.

The critical success factors behind CIMC's success are revealed in this issue's cover-page editorial interview with Liu Chunfeng, Vice-General Manager of CIMC Enric Holdings and General Manager of Nantong CIMC Transportation & Storage Equipment Company Limited.

ITCO, the tank container organisation representing the global tank container industry, estimates that 76% of the world's entire production of tank containers in 2013 was manufactured in China.

China's preference for tank containers will inevitably grow, as will its direct involvement in the tank container industry. Good news for some; bad news for others.

Leslie McCune, Editor

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# Evonik and Duisburg expand co-operation

Evonik Industries AG and Duisburger Hafen AG (duisport) continue to expand their successful collaboration and are making a contribution towards strengthening the North Rhine, Westphalia industrial region.

The objective of this strategic partnership is the development of modern logistics concepts and long-term site development.

Evonik and duisport have already been sharing responsibility for operating a public combined transport terminal in the Marl chemical park, the Marl cargo terminal (UTM), since 2006. The new co-operation will also involve a review of the collaboration regarding the storage of non-hazardous materials for Evonik chemical locations.

Another focus area concerns the expansion of combined transport traffic from and to Evonik locations through the port of Duisburg. In this way, Evonik is also strengthening its own commitment to reduce emissions during transport and also benefits from the proven competence of the port of Duisburg as a central cargo hub for continental and intercontinental container volumes.

The collaboration also aims to develop the location in the long term and to strengthen the North Rhine, Westphalia industrial region. In this context, the focus is on chemical locations with shipping piers, pipelines, connections to rail networks and other important infrastructure facilities that offer the ideal conditions for specific chemical and general logistics.

Evonik and duisport want to



Thomas Wessel, Chief Human Resources Officer of Evonik Industries, and Erich Staake, Chief Executive Officer of Duisburger Hafen, sign the agreement

analyse and utilise this potential.

"We are pleased to expand our successful collaboration with the port of Duisburg and strengthen it in the long term. The co-operation will allow us to improve Evonik's competitive and cost situation in logistics. Moreover, we will also make a strong contribution to the development of the North Rhine-Westphalia growth region," explained Wessel.

Staak added: "Evonik's trust reinforces our full-service approach of developing and jointly implementing integrated logistics solutions for the cargo industry. The expansion of our long-standing partnership is proof that industry and logistics are two sides of the same coin and that this can lead to the realisation of considerable value-added potential."

## Lanfer and Wauters agree to merge

Europe-wide logistics companies Lanfer Logistik GmbH and Wauters Tanktransport N.V. have agreed a corporate merger.

The firms said that by this merger the foundation would be laid for a better and more flexible comprehensive service to customers in Western, Southern and Eastern Europe.

Since early July, Lanfer, with its headquarters in Meppen, Germany, has held the majority of the shares of the Belgian transport company Wauters Tanktransport with affiliates in Belgium, Spain, Italy and Slovakia. „

"The strategic partnership with Wauters gives us access to interesting relations. Furthermore,



we want to develop and intensify the existing deepsea activities as well as tank and container storage activities", explained CEO Hermann Lanfer.

The merged firm's share of intermodal rail transport will increase by around 10% to a total of 40%. With its deepsea activities Lanfer also provides a new and promising business segment, he added.

"In the deepsea sector to India and China we see a great opportunity, as many of our current customers are already dependent on these connections."

Through this merger the shared pool of equipment will be enlarged to more than 550 trucks, more than 1,200 containers and more than 1,100 tank trailers and chassis.

"With a total of more than 950 employees at branches in Germany, Belgium, the Netherlands, Spain, Italy and Slovakia we will broaden our range of services and increase our flexibility."

The business operations will be run jointly by Managing Directors Hermann Lanfer and Etienne Wauters. For the time being the organisational aspects of existing business will not change.

## Bohai Leasing to acquire Cronos

Bohai Leasing Co Ltd, a PRC company listed on the Shenzhen Stock Exchange and parent of the Seaco marine container leasing group, announced it has signed a memorandum of understanding (MOU) with Cronos Holding Company Ltd of Bermuda.

The transaction has been arranged by Bravia Capital, a Hong Kong based investment and advisory firm with a primary focus on transportation and logistics investments worldwide.

Seaco and Cronos will continue to operate separately during the period prior to the finalisation

of the acquisition. Following completion, the Bohai subsidiaries will own a combined 3,420,000 CEU container fleet, making Bohai owner of the largest container lessor fleet in the world.

"Cronos Leasing has an excellent reputation in the container leasing industry as a company with a young, highly diversified fleet that serves a wide variety of clients around the world" said Seaco CEO Jeremy Matthew.

He continued, "These assets will greatly enhance Seaco's presence in the global container leasing industry and allow us to better serve our stakeholders."

## ExxonMobil makes big investment in Antwerp

ExxonMobil is showing confidence in the port of Antwerp and European industry with a mega investment in its refinery.

The American oil giant is to build a plant in the Antwerp port area for converting heavy, high-sulphur oil residues into cleaner oil products and transport fuels such as diesel and fuel oil for shipping.

With this investment ExxonMobil will extend its product range in Antwerp and boost its competitive position worldwide.

Over the past decade the American concern has already invested more than \$2 billion in Antwerp to meet the European demand for fuels and other products.

ExxonMobil already has a solid presence in Belgium, with a refinery (320,000 barrels a day) and three chemical plants (one for hydrocarbon solvents and two for polyethylene) plus its European R&D centre.

The ExxonMobil investments are only the latest in a series of impressive capital projects by the oil and chemical sector in the port of Antwerp over the past few years. As a major

integrated petrochemical cluster the port of Antwerp has many advantages when it comes to developing industrial activities into profitable investments.

In order to encourage this trend the port authority has set up a special unit to support the oil and chemical cluster in Antwerp by, among other things, carrying out marketing activities aimed at existing companies and promoting the operation of the supply chain.

In addition, the port authority will stimulate the physical renewal of infrastructure and offer state-of-the-art capacity. The ultimate aim of these efforts is to enable the oil and chemical sector in Antwerp to grow more rapidly than its direct European competitors.

## TWS bolsters its team

TWS can draw on more than 25 years of experience in renting out tank containers for transporting liquid products used in the chemical and food industries. The company relies on purpose-built equipment and market niches, and is continuing to invest in additional high-quality tank containers.



Following the company's restructuring, Frank Bolte (pictured) has been in charge of its Operations division since April. He aims to guarantee and continue to improve the reliable, rapid and global availability of the TWS fleet, which has expanded to currently 6,000 tank containers.

Bolte embarked on his professional career by training as a forwarding merchant with the international logistics company



HOYER in Hamburg. Within the field of forwarding and logistics, his main interests have always been the marketing and technical features of tank containers.

Over the past 30 years, he has demonstrated his skills working for leading logistics companies in Germany and Europe. He held executive managerial positions at

Bertschi and at DB Schenker BTT for almost 10 years each, and most recently was in charge of selling tank containers and commercial vehicles in Germany, Austria and Switzerland for Van Hool NV.

And, since January, the Sales division, led by André Bauer, has enjoyed the support of Jan Hempelmann as Sales Manager.

## TEPSA launches new freight train service

TEPSA has made its first run of ISO container freight cars on its siding in Barcelona.

The company, which celebrates its 50th anniversary this year, launched the new freight car loading and unloading service

## Diamond day for Suttons



Suttons Transport is celebrating its 60th anniversary.

To mark this milestone, the company has decorated four new DAF tractor units with the anniversary logo and the UK Union Flag.

Suttons is one of the largest private, family owned companies in the UK. In 1954 founder Alf Sutton set up the company with 18 vehicles and 58 staff following the de-nationalisation of the long-distance haulage sector.

Today, Suttons operates one of the UK's largest shared user chemical road transport networks, provides logistics and supply chain services for the gases, food and petroleum sectors, is world renowned for its technical capabilities and quality of service and has won many awards for its safety performance.

The company has successful operations across five continents and

now employs more than 800 people.

It's also a year since Alf's grandson John Sutton, took the reins as CEO of Suttons. He said: "De-nationalisation, a rapidly expanding road network and burgeoning motorway system provided the company with the freedom to truly push technology and provide customers with alternative solutions.

"One example of Alf's ingenuity was adapting his six-wheeler fleet to be able to carry four tonnes more payload by adding a trailer in a system which became known as wagon and drag. The system gave Suttons a legal payload of 22 tonnes which was substantially more than the competition.

"There is no doubt that this resourceful and innovative approach laid the foundations for the modern day transport and logistics sector."

Suttons was also at the forefront of tank container development. John Sutton added: "Suttons grew consistently, always always looking for new and emerging markets and trends to capitalise on. One such emerging market was the use of ISO tank containers to transport chemicals.

"Our customers needed heating systems on ISO tanks and in the early 1970s Suttons was the first company to develop this technology. We designed and built our own systems for heat sensitive products, further broadening the range of products we could carry."

he said: "Suttons has enjoyed many successes in the last 60 years and looks well placed to capitalise on the opportunities it has identified across the world. We are proud of our past and excited about our future."

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for chemical products.

The siding, which TEPSA built in 1989 on the terminal site located at the Muelle de la Energía (Energy Dock) in the port of Barcelona, began with the loading of petroleum products (mainly diesel) and has been in sporadic operation since due to fluctuations in demand.

TEPSA launched a project in 2013 to modernise the Barcelona railway siding, initially investing in adapting the facilities to handle the loading and unloading of freight cars carrying chemicals. Early work involved the installation of meters, pumping equipment and the safety equipment needed to handle this type of product and in the adaptation of the infrastructure for the loading and unloading of ISO containers.

The first product that put these improved facilities to the test was monoethylene glycol (commonly known as MEG). A load of 208,000kg was transported in early June on a convoy of four flatcars and eight ISO containers that were loaded through the inferior valve.

The inauguration was attended by the other operators and organisations involved (Adif, Renfe, Logirail, Novapet and the Barcelona Port Authority).

Now TEPSA is considering incorporating the European gauge as part of the modernisation of the siding in order to be able to connect to the UIC general rail network that connects Barcelona Port with France.

## Suttons acquires Imperial Tankers

Suttons Group, the international chemical logistics and supply chain specialist, has acquired Imperial Tankers, one of the largest bulk chemical transport companies in the UK from Hargreaves Services PLC. Terms of the transaction were not disclosed.



The first product that put TEPSA's improved facilities to the test was monoethylene glycol

Founded in 1989, Imperial Tankers has a road tanker fleet of over 200 tractor units and 350 tanker semi-trailers and provides both fully managed logistics solutions and single 'spot' product movements to deliver a wide range of hazardous and non-hazardous chemicals and other highly sensitive products.

John Sutton, Suttons Group CEO said: "This transaction is an ideal fit for Suttons and will enable us to continue to deliver high levels of safety and service, improve efficiency and add value through supply chain resilience and innovation."

"Our combined fleet of over 700 road tankers gives us an

even greater ability to support our customers through times of peak demand and react rapidly to changing customer requirements.

"By combining the various services offered by each company, we will be able to provide a truly exceptional customer experience that is focused on safety, service and innovation."

This is the third acquisition Suttons has made in the last 12 months. In October 2013 the company completed the purchase of Chinese transport company Hanchi Logistics, and in August 2014 Suttons acquired IS Logistics Group, a logistics and supply chain specialist based in Singapore.



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## Eurotainer goes supersonic!

Richard Noble is already the holder of several land speed records – the last one with the first car to exceed the speed of sound, in 1997 – but that is not enough and he is now building a car to reach the 1,000 miles per hour (1,600kph) target in the hands of Royal Air Force pilot, Andy Green.

Bloodhound SSC is currently being built in Bristol, UK and the record attempt will take place on the 19 km long Hakskeen Pan in the North West of South Africa in 2015.

The car will be propelled by an airplane gas turbine to a speed of 600 miles/hour, at which point a rocket is lit up and takes over the propulsion to the terminal speed. The combustion enhancer of the rocket is a very high concentration hydrogen peroxide which is injected at a rate of 200 litres per second (53 US gal/sec). Better than figures, to give a scale of the operation, the pump is driven by a full race Formula 1 engine.

A year ago, the Bloodhound team called on Eurotainer to bring its expertise on handling, transporting and storing the peroxide used in the project. With 30 years of experience and a fleet of over 2000 hydrogen peroxide tanks, the operator was able to advise them on the type of tank that met all the regulations and the safest way to handle this highly unstable chemical.

Thus, Eurotainer became a sponsor of Bloodhound SSC by supplying a 17,000 litre capacity tank container which will carry the product to South Africa and will be used for bulk storage at the track.

For the record to be valid, the car must reach the speed each way up and down the track with a one hour refuelling time maximum at the end of the first run.

Therefore Eurotainer has called on colleagues at CCR to supply



Bloodhound SSC is currently being built in Bristol

two small tanks which will be placed at each end of the track.

Bloodhound is not just a big toy for record freaks, it is sponsored in a very unusual way. Packed with advanced and diverse technologies, it is used as an educational tool for children of over 200 schools in Europe and South Africa.

The team travels to the schools regularly and involves the pupils in an interactive way to the physics, design and construction technology of dynamic objects. They build their own machines, study the results and compete in record attempts.

The goal is to raise the interest of students for engineering which is so lacking these days. Several students have opted for related studies since the project started.

## Free container industry image app

Creating, sending and sharing photo reports on your depot yard has just been made easier. With the release of the DEPOT Image App in September it's done in just a swipe.

By just taking photos on your smartphone or tablet, it's possible to start sharing them with colleagues, customers, transporters or lease and insurance companies.

"When a container is damaged,

it's always the question when did it happen and who's responsible for the costs," DEPOT Product Manager Bart-Jan de Jong explains.

"Is an estimate or repair order being drafted, the paying party often wants to see what happened. This can be a time consuming job. It is possible to resolve these issues with the release of the Image App," he said.

"Using the Image App a photo report is generated in just a few clicks, which can easily be done with a smartphone or tablet.

"After creating the report and uploading it into our secure cloud, it's easily shared by sending a link to the project page.

"Great spin-off is no more e-mail bounces due to large attachments," he summed up.

The Depot Image App can be used as a standalone mobile app or in combination with Depot Software.

The company said in a statement: "This depot management system is a world leading management solution providing a full-service software solution for repair/cleaning depots and container terminals."

The app can be downloaded for iOS or Android at [www.depotimageapp.com](http://www.depotimageapp.com).

# 2014 Tank Container Directory

The 2014 edition of the Tank Container Directory is now available

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The four editorial sections are:

- Tank Container Operators
- Tank Container Lessors
- Tank Container Manufacturers
- Equipment & Service Providers

Each section has a geographic listing at the front followed by a comprehensive alphabetical listing.



## Etihad Rail signs MoU with NewPort Tank Containers

Etihad Rail, the developer and operator of the UAE's national railway, has signed a Memorandum of Understanding (MoU) with NewPort Tank Containers, a leading global tank container operator.

The agreement, signed by Eng. Faris Saif Al Mazrouei, Acting CEO of Etihad Rail, and Pim van den Doel General Manager Middle East & India, of NewPort Tank Containers, will allow NewPort to adopt rail as a transport solution for its shipping and logistics services in the region. The MoU represents yet another successful partnership with an organisation that recognises rail as the preferred means of cargo transport in the MENA region.



"Etihad Rail is committed to supporting business and economic growth in the region," commented Eng. Faris Saif Al Mazrouei. "The national railway network will enhance our country's reputation as a logistics hub. We look forward to facilitating the safe, efficient and cost-effective delivery of NewPort's shipping services in the UAE and adjoining regions."

NewPort is a global, bulk liquid, logistics platform which specialises in tank container transport.

"NewPort is expanding its global operations said Pim van den Doel from NewPort. "We have established a strong presence in the Middle East and appreciate the importance of intermodal transport for further growth in the region."

"Rail transport is ideal for handling materials in bulk quantities, and allows us to enhance our service efficiency in the region. The Etihad Rail network will play an important role in helping us to provide our customers with a complete package of superior logistics and cost efficient services."

Upon completion, the Etihad Rail will cater to both freight and passengers, spanning

approximately 1,200 kilometres across the UAE. The rail network will connect urban and peripheral communities, facilitate trade, open up communication channels and foster economic development across all seven emirates. The network will also form a vital part of the GCC railway network, linking the UAE to Saudi Arabia via Ghweifat in the west and to Oman via Al Ain in the east.



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# 'Big' just got 'better'

In 12 years, CIMC Tank has come from nowhere to become a world-leading tank container manufacturer. Editor Leslie McCune explored the success with Liu Chunfeng, General Manager of CIMC Tank and his deputy, Leonard XH Yang

**When did China International Marine Container (CIMC) start manufacturing tank containers and why did it start producing them?**

The first Chinese-built, ISO-certified tank container came off the production line at CIMC in Nantong in 2001. The first customer was leasing company Cronos, whose initial order was for 100 tank containers. We are proud to acknowledge that, since then, Cronos has gone on to buy over 20,000 tank containers from CIMC Tank.

In 2001, CIMC was the largest producer of a number of intermodal container products, including dry containers, reefer containers and special dry containers. To be able to provide CIMC's clients with a "one-stop shop" solution, CIMC



decided to add tank containers to its production portfolio.

This additional business offered good synergies with the group's other intermodal container businesses.

**CIMC Enric has had enormous growth over a short time – how**

**has that been achieved?**

The industries on which CIMC Enric focuses are energy, chemical and food. 50% of our revenues are generated from the LNG-related energy division, which is benefiting from the trend to leverage LNG's better environmental credentials



and its often compelling economics for energy use.

The second highest sector for growth is our food division. This has benefited from the recent acquisition of German-based Ziemann International GmbH.

Ziemann became a 100% subsidiary of CIMC Enric Holdings Ltd in August 2012. With CIMC Enric Holdings, it is a 100% subsidiary of the Netherlands-based CIMC Enric Tank and Process BV. Ziemann's affiliate, Holvrieka – an international tank specialist – is likewise a member of CIMC Enric Tank and Process BV.

The tank container business operates in our chemical business division and we see the further "tanktainerisation" of the industry – ie, more bulk liquid, gas and powder products will be moved in tank containers of different technical design.

The tank container has been proved to be safer and more environmental-friendly than several other alternative transport modes, such as drums and flexibags.

Tank demand has also been driven by the economics of using tank containers for small-to-medium size storage tanks, and in place of small parcels on chemical parcel tankers.

Tighter inventory control has led to more frequent flows of smaller bulk lot sizes.

All these factors have contributed to our enormous overall growth.

CIMC Tank now employs over 3,000 staff and had record revenues of Rmb3.3 billion (US\$530 million) in 2013.

Our target is to reach Rmb6 billion (\$960 million) by 2017.

## What's the range of tank containers that are manufactured?

In general, our product portfolio has a comprehensive and wide-ranging coverage of overall market needs. This includes standard liquid tank containers, various



special liquid tank containers, gas tank containers, cryogenic tank containers, lining tank containers, powder tank containers and offshore tank containers.

## How many tank containers can be manufactured each year?

Our current production is about 20,000 units of various types.

## How is quality guaranteed?

There are very well established industry regulations for quality assurance and quality control. Very demanding test and approval certification criteria are in place and we meet all industry standards.

These rigorous standards are also the reason that tank containers have been proved to have such an excellent safety record as a transport means for most liquid, gas and powder cargo.

## What have been the major innovations at CIMC Enric?

We use our own Product Development System, which includes 3D design, finite element analysis and computational fluid dynamics analysis.

This has led to new frame designs and other innovations for tank containers, swap containers and wide-body tank containers.

CIMC Tank developments have

## Liu Chunfeng C.V.

Liu Chunfeng obtained his Master's degree in engineering in 1988 at the Mechanical Engineering College, Shandong University of Technology.

Since 1989, Mr Liu has been the manager of the marketing department, the engineering department and the development department in STAS, and the manager of R&D in SCRC.

He also served as General Manager of the R&D Management Division at CIMC group in 2003.

Since 2010, Mr Liu has been the General Manager of Nantong CIMC Tank Equipment Co Ltd and was promoted in 2012 to become Vice-General Manager of CIMC Enric Holdings Ltd, since when he has also been the General Manager of Nantong CIMC Transportation & Storage Equipment Co Ltd.

Mr Liu is a member of SAC/TC6 and PPAC.

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# CONTAINERS IN MOTION

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led to an increase in gross mass from 36 tonnes to 39 tonnes and an increase in the maximum cube to 43,800cu metres for over-high, over-length and over-wide frame configurations.

In addition, we have pioneered new test methods to help in the design and verification of the mechanical properties of our products. These include fatigue testing and new test methods to help with the design of several tank container functions, including heat leakage and heating efficiency.

New functions have also been added or improved in the design of tank container, such as linings, heating systems, baffle configurations, etc. New materials have also been introduced.

## **Where is most research and development focused?**

Our R&D philosophy is to focus on what CIMC Tank calls "SGIL". This stands for Safe, Green, Intelligent, Light.

These elements underpin all our research and development programmes and have led to the development of products such as large capacity swapbody tanks, 39-tonne truncated collar swapbodies, so-called "bottom freedom" tanks with interrupted bottom cross members to enable access and ellipsoidal

low-pressure, high-volume tank containers for the China market.

## **What plans has CIMC Tank for the future?**

We have many, but we are especially excited by our new line focusing on cryogenic products.

We started producing cryogenic tanks in 2008 but our new dedicated line will include cryogenic road tankers, standard storage tanks and tank containers. In general, our expansion plans will increase our engineering capability, our production efficiency, our quality stability and enhance our service coverage.

## **How have customer preferences changed?**

The market wants safe, green, intelligent and lightweight attributes in their tank containers. Customers also tend to want more functionality in the design so that a wider range of chemicals can be carried in a single tank container. Functions such as heating and baffle configurations are becoming very specific.

## **What are the main drivers of tank container demand?**

Safety, green credentials and economy are the general trends. We see tank containers replacing more and more drums, flexibags, small tank parcels and

fixed small storage tanks in the transport and logistics sector.

## **What are the growth opportunities in the tank container market from a manufacturer's perspective?**

The development of the market in the past year has been extraordinary. In general, we would expect an average annual growth rate of 8-10%.

Our biggest opportunity is to help the industry increase the overall demand for tank containers, and we are committed to this ambition.

## **What is range of customers of CIMC Tank?**

End users include chemical producers, food manufacturers, tank container operators and tank container leasing companies.

## **Are most raw materials sourced from China?**

Since CIMC started tank container manufacturing in China, we have been able to develop and work with our local suppliers to create an excellent locally-sourced supply chain for raw materials.

Stainless steels such as 316L are purchased from South Korea, Japan and Europe.

## **Would CIMC consider manufacturing tank containers outside China?**

Not in the near future.

# A tank of best, please

The world's favourite alcoholic drink was for many centuries transported in wooden barrels. Today, stainless steel helps slake the thirst of global beer drinkers, writes James Graham

Beer is one of the world's most popular drinks. Brewers and beer distributors require very specific and specialised food grade tank containers to keep the perishable product safe along the supply chain.

The market is differentiated into two main types of beer products: premium artisan or craft beers, produced in relatively small volumes at lower cost; and commodity mass-produced beers, often carrying very well-known brand names. Volumes for the latter are measured in millions of litres.

Both are moved in tank containers. Connecticut-based beer importer B.United International brings European and Asian craft beers to drinkers in the United States by using seven fully temperature-controlled tank containers, each divided into four independent compartments holding around about 120 kegs or casks of beer.

These specialised containers offer the cost-effectiveness of containerised transport for



Australian beer can be seasonal in volume

those brewers, such as De Dolle Brouwers, Thornbridge Hall and Brasserie des Franches, which would not be able to justify the use of a whole container. B.United owns seven containers, with two dedicated to Japan's Kiuchi Brewery.

They usually fill two compartments with Hitachino Nest White Ale with the remaining two compartments filled with two different Hitachino Nestbrews, says Matthias Neidhart, B.United founder.

Compartment pressure and temperature matches each beer's specific recipe, temperatures usually ranging between 32 and 34 degrees Fahrenheit.

However, it is a one-way business at present for B.United. Neidhart says: "It is part of our future plans. Right now, we are so strapped for capacity we cannot afford to use our resources to include US breweries for exports."

The company offers semi-

automated keg cleaning and a filling line for clients as well as a laboratory that clients can use for quality control.

Neidhart says: "We offer this to provide 100% quality control, cleanliness and control over kegs that need to go into re-fermentation. Many of our small breweries do not have a semi-automated keg cleaning and filling station. Without such equipment, any quality control is random and non-systemic.

"Our laboratory does a full analysis on each incoming brew: specific gravity, active yeast count, Ph value and more. All critical parameters to perfect re-fermentation as our brews are bottle and keg conditioned."

When in the US, the containers are normally moved by road with only select movements by rail, says Neidhart. The freight transactions and arrangements are undertaken by a third-party freight forwarder.



As an importer in the artisanal beer market, B.United uses bulk transport for green and business reasons. Neidhart says: "Using tank containers and returnable stainless steel kegs that stay within the US is the only way to reduce environmental impact, achieve the highest product quality and freshness possible and allow re-fermentation in kegs instead of "forced carbonation" at the same time."

"Within the segment of artisanal brews, draught is the single most important marketing tool. There are two ways to conduct draught business as an importer. The first way is to ship (stainless steel) kegs back and forth. This is very inefficient, costly and an environmental burden.

The second way is to use one-way kegs, but no re-fermentation is possible as it too risky i.e. there is a risk of exploding kegs due to the lack of a systematic recycling system in the US. This results in all one-way kegs, with many ending up on landfill," he says.

While there is a relatively small volume of bulk beer shipments by deepsea tank containers, the major container manufacturers provide equipment to support this niche industry.

One lessor that makes such equipment available is lessor Eurotainer SA, that makes tank containers suitable for beer in 21,000 to 26,000 litre volumes, says Christopher R Daly, its global marketing manager.

As brewers and distributors of beer require very specific and specialised tank containers, it is reasonable that Eurotainer's products are complex, considers Daly.

He says: "Tank containers constructed for the transport of beer may have a several of the following components on the tank: refrigeration system; super insulation; carbon dioxide line and

connection; cleaning-in-process system; cooling coils on the bottom and the top of the tank container; heating system; and large capacity."

Temperature controls are very important on beer shipments given the nature of the product. Daly says: "There are upper and lower temperature limits for beer that must be adhered to. Temperature control is a key factor when shipping tanks of beer on ships that cross tropical or potentially arctic regions."

Daly has noticed that there are few one-off shipments involving beer: "Our business is long-term leasing. This fits with the typical use of tank containers for beer because containers are dedicated for long-term projects focused on intercontinental transport of the beer," he says.

Eurotainer SA has leased beer tank containers in Canada, the US, Japan, Germany, Belgium, France, the UK and other countries. There is little seasonal element in leasing for beer transport as it is reasonably stable throughout the year. However, there is a degree of seasonality in the Australian market as demand increases just prior to summer.

Arnaud Claes, sales manager in the tank container department of manufacturer Van Hool, says his company's products "always try to offer customers innovative concepts".

He says: "Van Hool's latest evolution has been the ultra-light beer tank container of 29,500 litres on a 7.15 metre swapbody with a tare weight of 2,500 kg.

"Customers can state their own preferences and requirements with regard to carbon dioxide, cleaning lines, sampling devices, cooling circuits and outlets. The starting point in our sales process is always a good conversation with the customer in order to find out what they are specifically looking for."

Van Hool's 7.15 metre swapbody

is very popular, says Claes, as it is a size and weight that is optimised for intermodal traffic, with a total weight of 44 tonnes. For worldwide, intermodal traffic using 20ft tank containers, there is trend towards 23-24,000 litre containers, depending on whether a reefer unit is taken and how much insulation is required.

Beer containers usually need to be delivered at the beginning of the spring. "There is, of course, a clear relationship between good weather conditions and beer consumption," says Claes. "More and more, we also see tank containers being used at music festivals, public events as well as mobile storage tanks."

According to Andreas Werle, sales and business development manager at Hoyer, a significant share of its tank containers are used in the beer trade.

He says: "Roughly 50% of our food container fleet is used as beer tanks. Beer is a one-way traffic although some breweries allow reloads of juice or wine. Others demand a 'beer only' usage of the tank containers."

In Hoyer's experience, a significant majority of all beer is shipped in bottles ready to drink. However, container tank use is significant on domestic European beer shipments.

Hoyer does not operate its own cleaning stations. This means that clients must use third-party facilities for tank cleaning and carbon dioxide purging. As all breweries have their own standards for the cleaning the choice of cleaning stations can be limited, especially as the cleaning stations are usually not in the brewing region.

Beer is a straightforward product that has been moved and stored historically in wooden barrels. But it is now easily transported in tank containers. Despite stainless steel offering less of the romance of wooden barrels, beer drinkers the world over will raise their glasses to that.

# A pearl of a company

## Cool chain specialist Klinge Corporation, is celebrating its 30th anniversary this year, writes Katerina Kerr

Klinge Corp, as it is known now, began its modern history in 1984 when it was purchased from York Borg Warner.

"However, the roots of the company go back a little further to the mid-1940s when my late grandfather, Paul Klinge, started a trading business in Denmark," says Vice President Allan Klinge.

"Eventually, the company grew to have a focus in refrigeration and became agents for York Borg Warner's marine transport division in 1972."

Development and production of special transport refrigeration units began in 1974, specifically for the export of Danish bacon and butter to the United Kingdom.

In 1984, Klinge bought the division and renamed it Klinge Corporation. The company maintained its equipment design and production in Denmark and after a number of years moved its department for specialty applications to the US.

One part of the specialty applications was a focus on glycol-based heating and cooling systems, primarily for the tank container market.

Most of the work in Denmark was standardised production and this was eventually sold to Sabroe (now owned by Johnson Controls) and, later, to Thermo King in the early 1990s.

In 2011, Klinge Corp acquired Kjellerup, Denmark-based Norfrig

Equipment, a supplier of ultra low temperature refrigeration and thawing solutions.

Over the course of Klinge Corporation's 30 years in the refrigeration and power generation business it has seen tank container manufacturers and operators strive to reduce space, weight and costs.

"Customers are certainly concerned with how much product they can move and how little space it is going to take up. So, two very important aspects for us would be minimising the size of the equipment and minimising the weight of the equipment in particular," explains Klinge.

"Our development goals are a little different than some of our competitors as we are focused on making a more lightweight and efficient option that provides the amount of capacity needed to maintain chosen temperatures, whilst minimising the amount of sacrificed product space."

Klinge Corp's systems are based on the product's loaded temperature being maintained throughout transit. Its units, therefore, have the required cooling capacity to 0°C and the option of a heating rate of between 5kW and 20kW.

The company's TCR-109 model serves most of Klinge Corp's market. It was developed primarily for cooling but it also supports an easily-added heating module with sufficient capacity for most applications.

The model is used when transporting many hazardous and non-hazardous chemicals, pharmaceuticals, food products and beverages.

The 144 kg system heats and cools the tank container's cargo by circulating glycol or synthetic oil around external cooling coils

within the tank. The unit is side-mounted on the bottom and the full electrical system is mounted on the end of the container to allow for easy service access during transit, and during stowage periods in stacks at terminals.

This electrical box has also in recent years been made even more compact for larger tank capacity and flexibility of placement. This was achieved by introducing the latest microprocessor technology to replace larger electromechanical components such as the phase sensor and overload switches.

The new microprocessor controller is working with amperage loop technology and has no moving parts. The development was an in-house initiative by Klinge Corporation's engineers.

The technology leap is now also being introduced to other of the company's refrigeration units.

In addition to allowing a more compact design control box, the removal of electro-mechanical parts decreases the use of wear items and increases reliability.

"When you are on a container vessel the electrical system is easily accessible with this model. It is more common to place the temperature display on the end of the container but not the entire control system so if something were to go wrong it would be difficult to trouble shoot on a vessel or when stacked," explains Klinge.

Much of Klinge Corporation's business comes from the chemical shipment industry, which due to the hazardous nature of the cargo must adopt dual system equipment under the safety requirements of the International Maritime Dangerous Goods (IMDG) directives.





The team with VP Allan Klinge

"The IMDG code has very specific requirements about having dual systems applied to certain products," says Klinge.

"To serve the tank container industry, we have a dual version of our TCR-109, which includes a special control box so that, if one unit experiences downtime, the secondary unit will pick up."

There is also the TCR-262, a nose-mounted dual unit that has two independent microprocessor thermostats that control and monitor the cargo temperature, and the TCR-262 unit offers a higher capacity than the above models and is mounted in the front of the container. It can also be made totally independent by connecting it to the company's integral generator set, Model NMG-115. However, high capacity units are often not needed for the tank container industry.

"The expansion of the size of tank containers is a great development for the customers but is a technical challenge that we have to take on in order to provide the best possible products for our customers."

In order to support its customers, Klingle Corp has a worldwide network of service plants to provide quick and effective servicing of its systems in case of an accident or other issue.

"At one point in our history we were providing all of the ship kits for P&O Nedlloyd as well as CP Ships and their daughter companies, before they were sold. That gave us a tremendous network of service points and contacts to work with."

"The serviceability and ability to quickly obtain technical support and different spare parts is what we try to focus on," explains Klinge, adding, "it is always a challenge, especially as more and more of this equipment makes it to market."

Physical challenges such as size, weight, capacity and accessibility are not the only attributes that must be taken into account when staying up-to-date in refrigeration equipment industry.

Over Klingle Corp's three decades in the industry it has seen an array of regulatory changes and requirements.

"We have seen an increase in regulatory requirements for foodstuffs in regards to how the product is being shipped and the records needed for end point discharge."

"We offer data loggers as well with independent temperature monitoring so that the operator has the ability to print out or download data during transit or at the end of the trip. This is an efficient way of confirming that the product has stayed at the correct

temperature the entire journey."

He explained that there have been changes from regulatory bodies regarding the transportation of hazardous goods or foodstuffs and, in the US, the Department of Agriculture has altered its requirements for shipping in the past to ensure long lasting suitability of tank containers for foodstuffs.

Klinge Corporation is also a member of the regulatory advisory group the International Vessel Operators Dangerous Goods Association (IVODGA), which helps to draft proposals for groups such as the International Maritime Organisation and United Nations Subcommittees focused on safe transport of dangerous goods.

"We have also seen more requirements in Europe for the unbroken cool chain, where the industry is trying to steer away from getting a product to a certain temperature before shipping it without available refrigeration capacity.

"Even if the systems weren't to be turned on until there is a significant temperature change, shippers and operators are trying to avoid power loss much more than in the past."

The company continues to design more advanced, lightweight systems to cater to its customer's needs.

Klinge reveals, "We are working to make an additional small unit that will fit on the 26,000 litre tank containers. Furthermore, we have just this year further updated our control system to be significantly smaller and still end-mountable and we are working to offer additional datalogger and GSM solutions for our customers."

"One of the concepts we are working with, if the market is there for it, is installing modems so the operator can control the system remotely. We offer a satellite tracking option which allows the operator to set temperatures, check the alarm status and location, and power on/off."

# Global container fleet approaches 400,000

**Editor Leslie McCune looks behind the numbers in ITCO's fleet survey**

ITCO, the International Tank Container Organisation, has published its second Tank Container Fleet Survey. It reveals year-on-year growth of 12% with the global tank container fleet now 394,400 units.

An estimated 42,620 tank containers were manufactured in 2013, representing a record manufacturing high and equivalent to an investment value of approximately US\$900 million. This implies an average price of US\$ 21,117 per tank container.

The survey included tanks for liquids, liquefied gases, powders, swap tanks and specials. Tank containers of less than 20' length, such as off-shore oil industry tank containers, were not included.

In the survey's introduction, Heike Clause, President of ITCO (and Managing Director and Chief Executive Officer of VOTG Tanktainer) comments: "The increased use of tank containers is largely dependent upon infrastructure and the availability

of service providers to truck, clean and maintain at the point of destination and enable a return load. Infrastructure providers need evidence of tank fleet growth to justify new investment and this is coming about as there are now an estimated 500 service providers around the world."

Despite the need for tank containers to undergo periodic inspections, and the requirement for test certifications to be renewed, there is – somewhat surprisingly – no global register of tank containers.

The trend for shippers (i.e. chemical, food and drinks companies) to outsource tank logistics to operators continues. However, a significant proportion of the global tank container fleet is operated by shippers.

Compiled with the support of ITCO members, the survey notes the increasing number of regional operators that have started up in recent years.

Tank container operators account for 67% of the global fleet with the top five operators – Stolt Nielson, Hoyer, Bulkhaul, Bertschi and InterBulk – accounting for 38% of the operator fleet.

Stolt Nielson – uniquely in the tank container sector – has complementary bulk liquid storage and chemical parcel tanker businesses. While tank container revenue has fallen since 2011, EBITDA (Earnings Before Interest, Tax, Depreciation and Amortization) increased by 12% to US\$95 million in 2012 and remained unchanged in 2013.

Hoyer's deepsea business unit, which manages the transports in tank containers and flexitanks outside



Stolt Nielson - uniquely in the tank container sector - has complementary bulk liquid storage and chemical parcel tanker businesses





Bertschi owns over 16,000 tank and dry bulk containers and is a shareholder in Log4Chem, the independent 4PL

Europe, contributed the largest share to Hoyer Group's earnings in 2013.

Group Earnings Before Tax (EBT)/revenue were 3.3%, which was reported as being 'above the industry average'. Hoyer owns 15.01% of fifth-placed operator InterBulk.

Bulkhaul is the least transparent of the top five operators but has successfully built up strong positions in key locations around the world.

Bertschi owns over 16,000 tank and dry bulk containers and is a shareholder in Log4Chem, the independent fourth-party logistics provider (4PL) which is a joint-venture with De Rijke Group and Hoyer.

By pooling activities in chemicals-related logistics, transport revenue of around US\$ 265 million was expected to be generated. Log4Chem does not have its own equipment but, instead, functions as a neutral facilitator between contractors and services providers. It facilitates both liquids and solids transports and focuses on "gearing up the efficiency of the supply chain – for example, to eliminate unproductive 'empty legs'".

The joint-venture is designed to

"market, co-ordinate and optimise all of the 4PL transport activities of the three shareholders", as it affects transports and logistics

### Global Tank Fleet 2014

<b>Operators</b>	
Owned	161,300
Leased	103,250
<b>Total</b>	<b>265,550</b>
<b>Lessors</b>	
Idle	17,650
Leased to Operators	103,250
Leased to Shippers & Others	55,600
<b>Total</b>	<b>176,500</b>
<b>Shippers &amp; Others</b>	
Owned	55,600
Leased	55,600
<b>Total</b>	<b>111,200</b>
Disposals	1,000
<b>Estimated Grand Total</b>	<b>394,40</b>
2013 estimated manufacture	42,620

Source: ITCO

services for the chemicals industry in Europe, Africa and the Middle East

In 2011, Sinotrans – one of the largest logistics companies in China – took a 35.3% stake in InterBulk, the fifth largest global tank container operator in 2013 (with 10,750 units, according to ITCO), and Europe's leading provider of intermodal 30' 'bag-in-box' containers for dry bulk products.

The top five leasing companies, Exsif, Eurotainer, Cronos, Seaco, Trifleet and TAL International, account for nearly three-quarters of the leasing fleet.

In terms of manufacturing, there are 18 companies whose outputs contribute to international tank production. There are many others, such as Qighar in China, that manufacture tank containers for domestic markets or specific customers; others produce for regional markets.

Often, these companies also produce road tank vehicles and/or and pressure vessels.

Nantong-based CIMC dominates the global manufacturing of tank containers, directly producing nearly half of all those manufactured globally (see this issue's feature article).

# Getting the big picture

**Every minute, 365 days a year, thousands, maybe millions, of signals are sent across the skies, tracking the movements of tank containers, writes Wendy Pascoe**

Customers can sit in their offices in Milwaukee or Tokyo or Cape Town and watch the progress of their tank containers as they transit from port to port, crossing continents. Delayed by bad weather? They'll know about it. An attempt to interfere with their goods? They'll know that too.

The technology behind the tracking is simple. Each container carries a unique identifier. Depending on the tracker supplier, and where in the world they are operating, signals are sent via satellite, GPS or a separate system using local GSM cells in areas where signals are lost – for example in mountainous regions or near tunnels.

The retrieved data is usually accessed via a website and can be incorporated into the customer's own ERP (Enterprise Resource Planning) business process management software, allowing instant monitoring of actual inventory flow in the supply chain and supporting back office functions.

Intermodal Tracker, based at Breda in the Netherlands, sells a low-cost tracking system, developed in consultation with Hoyer, which was its first tank operator customer. It is also taking part in several public



HGT's Ridgeback is solar powered

studies, including a European working group which is looking into future implementation of tracking tank containers carrying dangerous goods and the implications for security,

General & Sales Manager Bernard Heylen says a typical customer would be a tank container operator, a rail company which needed follow-up and protection for its wagons or a logistics company with intermodal transport. A typical journey could be anywhere, its systems work worldwide, but mostly the journeys are long distance transportation.

Heylen says: "Each container carries a device with a GPS and GSM module on board. At a configurable time interval, or based on triggers like movement or temperature of load, the device is switched on. At that moment it will localise itself (based on the GPS location with back by triangulation via the GSM cells) and retrieve other necessary device data such as the inside temperature of a tank.

"This information is then sent via the data channel of regular

network operators, the same technology used to get onto the internet with your smartphone.

"Our tracking systems are fully battery powered. They can send up to one position an hour, but typically customers choose two positions a day. In that setting, the unit will run for more than five years on a single battery pack. Mainly customers use our systems to help reduce costs and increase margins by using the information which is sent. For example a container standing for several days at a terminal may incur a demurrage charge. Before the end of the free charge period, we send an alert email to the customer who can take action to avoid that happening".

"Our data can be integrated into a customer's IT system so they can see if the cargo meets its estimated time of arrival (ETA). The ETA is then compared with actual arrival time. It helps measuring performance of the logistics chain. Transparency of the logistics is becoming more important and increasingly end customers do request this."

Trackers are also used for security. Heylen says: "Last month a trailer was stolen in Antwerp during the weekend. With our tracking unit, the customer got his trailer back which had already arrived in Poland."

"The typical cost per unit (one-off purchase cost and monthly fee included) is below €6 per month."

Belgium-based Ovinto uses space technology which it claims consumes several hundred times less energy than GSM technology. This allows it to track every few minutes and transmit every two hours, and continue to do this for more than four years. It says the more information a customer has, the better informed their decision making process.

CEO Frederick Ronse says all



information is sent to its Ovinto Sat® Monitoring System. At the same time, the exact location is determined via GPS technology. Regardless of location, the system is always able to communicate its gathered data via the LEO (Low Earth Orbit) Globalstar satellite network with some 50 satellites covering the world. Data is transferred, via encrypted satellite communication, to highly-secured company servers from where it can be relayed, in the proprietary format, to the customer.

Hazardous goods can be monitored in any unpowered transport unit, with sensors capturing critical data on location, pressure, temperature, levels, shocks and leakages. The system can also monitor a customer's cargoes in a Zone 1 explosive environment.

Ronse says: "The customer will know very quickly if someone has unloaded goods from a container or is filling a container at an unknown location. They can know within minutes if the containers are already shipped, have arrived yet, been unloaded yet, been cleaned or are available for a return cargo.

"Data every two hours helps analysis of your fleet too. For example, how many hours were the goods on critical temperature levels? At which specific location did that take place?"

Ronse says that detailed analysis of container movements can help trim journey times, maximise capacity and improve profit margins.

Coll MacDougall Hunter, CEO of Switzerland-based Hunter Global Tracking, says he was drawn to tracking after working in areas of the world where everything not bolted down was stolen or 'disappeared'. Early tracking systems, particularly in trucks, were linked to the ignition battery but cut the cable and the loads were yours.

"Our units are totally autonomous. They could be hidden under a tank, inside it, or even become part of its structure. The units, which are German manufactured, are highly

intelligent and multifunctional, they can link together, and as well as position, they can give other data including temperature and humidity, important if your cargo is volatile."

MacDougall Hunter and his colleague, Managing Director Ben Liffen, name their units after dogs. "The Rhodesian Ridgeback is a tough hunting dog which can run for 30 miles without stopping. HGT's Ridgeback is solar powered and can go on for a very long time, can continue to transmit for six months in a dark building and has a nano cover which protects it from outside elements like sand and dust. It can also be supplied with a tough smash protection cover. If it is tampered with the customer is immediately alerted."

"The Bulldog unit is similar but has no solar panel. It will run for 15 years without battery charging when sending one message (or ping) a day. It's available with global coverage, operating on both quad and tri-band width i.e. in both the US and globally, and has an option for satellite communications.

"Our Pitbull is ridiculously tough and made to survive the harshest conditions. It operates up to +60OC and down to -30OC. It is completely waterproof and is safe under anything - it has and does everything except satellite communications, which are optional."

Liffen says: "Customers don't realise they need tracking until they have it. Then they start to realise they can

be more productive, checking which employees are performing well, ensuring there are no unexpected movements in cargo or unplanned changes in speed or direction. Trackers provide proof of delay if you need it. And they can be geo-fenced, which means sending an alert if the load moves outside of a specified area, for example 1km around a port."

Their pricing is a one off payment where device, data messages, platform and everything for 24 months is paid for upfront.

Liffen says: "In this modern age, insurance companies are expecting more often to see tracking used to protect loads. I see a day where it will be essential in the future."

In the US, Savi is taking the analysis of the data gathered to the next logical conclusion, making it cloud based while providing far more detailed context. It collects vast amounts of sensor and machine-generated data via its network of wireless Automated Identification and Data Collection equipment and software, using simple barcodes, RFID technology and GPS. It combines this information with that from Enterprise Systems and other data such as weather, traffic and social media, and uses it all to produce a big picture with easy to understand visualizations.

The company says it turns every individual in an organisation into a "knowledge worker", without the requirement of being a business analyst or data scientist.



# Full of eastern promise

Tank operators are looking to expand in China and in the wider Asia region, but the pace and focus of growth is unpredictable. Felicity Landon looks at the implications for those in the leasing market

"Most operators, if they need tanks, need them yesterday," says Ian Routledge, Vice President Asia Pacific for Raffles Lease.

And that sums up the dilemma for operators looking to make the most of the growth in demand for tank container solutions in Asia. Everyone agrees that the market is expanding. Everyone is optimistic that will continue. But there's no crystal ball in terms of the exact details.

"There is definitely a growth in tank container operators in China and Asia; some are home-grown operations, including those being run by people who used to work for one of the European or American operators and split away to start their own operation. Others are some of the big European operators setting up operations with Asian shareholders," says Routledge.

"If you look at the global market, Europe and America are sophisticated markets that have



already seen a lot of growth – that is because of the environmental pressure to get products out of drums and into tanks. Probably 70% of the tank operators in the world are based in Europe and America, so that leaves around 30% based in Asia. But the balance is changing – you can see that in certain countries, Asian tank operators are starting to get much bigger."

Of course, companies like Raffles Lease rely to a large degree on the success of the tank operators they serve. "We rely on how well they do and how strong their trade is and whether they are going to use the capital they have to buy tanks or use the capital elsewhere and lease tanks," he says.

"At the moment, the trend is largely leasing. A lot of these operators want to grow their tank business but they don't

know how quickly it is going to grow and where and what contracts they are going to get, so they rely on leasing.

"What happens, therefore, is that they will pick up a contract to move a product and don't have enough tanks, and there is a lead time of several months to get a new order of tanks, so it is probably easier to go to a leasing company than to buy."

Owned by Buss Capital, a leading German KG house, Singapore-based Raffles Lease is a relatively new company in tank containers. "We started investing in tank containers about a year ago – and we have gone from nothing to about 2,000 tanks in a year. We continue to build tanks, because we think it is a good product for our investors and a growing market, but there are some key



factors,” says Routledge.

“Not least of these is the limited manufacturing capacity for tank containers. The [dry] box manufacturing sector has the capacity to produce up to 4m TEU – and is currently producing around 2.5 million TEU. You can order a box today and get it next month. But no more than 40,000 tank containers are being built a year. Tank containers are, of course, more complex and if you order today, you won’t get the tank container for four months.”

Lessors also have to second guess what their clients might actually need. “We ourselves are buying different specifications, so we have to decide what types of tanks we are going to build,” says Routledge.

The Raffles team gave a great deal of thought to the design of the tanks they ordered, securing a fleet that can be acceptable for a range of customers at short notice.

“In Europe, tank operators will ask for very specific features, whether it’s a different walkway/ more complex heating systems and collapsible handrails, amongst other health and safety related modifications. But in Asia, the market is not yet so sophisticated. We don’t see many tank operators in China asking for specific design features. That will change as time goes on, particularly as more health and safety regulations are introduced in China.”

The availability of cleaning stations is another challenge in the Chinese/ Asian market. While a hub like Singapore provides the necessary facilities, the overall infrastructure in the region is nowhere near the sophisticated facilities provided in the major hubs in Europe or the US.

Environmental and cleaning standards should, ideally, be the same in Asia as elsewhere – but in practice they often are not, says Routledge.

“To grow the tank container



business you need to have cleaning stations – and that means properly qualified, environmentally approved stations where waste is properly disposed of. Because Asia is still a relatively new market, there is not the same number of cleaning stations.

“To a degree, that is also slowing growth in the region. But we are seeing more companies investing in cleaning stations, and that will help growth of the sector as manufacturers move from drums and other packaging methods to tank containers.”

While Raffles Lease is one of the smaller tank container lessors in the market, Seaco Global is at the other end of the scale – and set to grow dramatically with the pending acquisition of Cronos by Seaco’s parent, the Chinese company Bohai Leasing.

John Bannister, Seaco Global’s head of tanker containers, based in Singapore, describes Asia as a difficult market for leasing companies as a whole.

After an flurry of new tank container operations, many set up by individuals who had left

bigger operators, he says the honeymoon period is over “and some are realising that operating tanks is a lot more involved than they originally thought”.

“There is pressure on the market – some companies are struggling a little bit and wondering if their business is viable,” he says. “In some cases, ground is being lost by them and the bigger companies established a few years ago are beginning to gain ground again. Many chemical companies are realising they need reliable, long-term partnerships with well-established operators. We have come across people who obviously have experience and decided to set up their own business, but I am not sure they put together well thought-out business plans.”

There is demand for tank containers, says Bannister: “It quietened down for a while but I think it is picking up again. It is obviously an important area which people are focusing on – the tank container market is expected to grow and all the figures are fairly positive. So, there is obviously business to be had – it is a question of how it is shared out among the operators.”

As a lessor, Seaco Global’s operation in China is much the same as elsewhere in the world, he says. “There is maybe a little bit more focus on relationships and there are maybe different ideas of how the operators conduct their business. I think they are still learning about issues like health and safety, repair criteria and standards. Certainly it is a little bit different in Europe, where it is stricter, but China is changing and it is getting there.”

As well as its Singapore headquarters, Seaco Global has an office in Shanghai and its regional offices included Taiwan and Korea. Its customers are very wide-ranging, says Bannister.

“We lease to operators and we

deal with chemical companies – some well-known, others smaller or niche firms not so widely known. The interesting thing about the tank market is its very wide, diverse customer base. If you spoke to one of my competitors and compared the list of their customers with my list, you would find quite a few different ones.”

Eurotainer’s activities in Asia Pacific are managed by a regional head office in Singapore and with additional offices in Tokyo, Shanghai, Tianjin and Brisbane. Each office is staffed with sales, customer service, maintenance and repair personnel, and the company also retains agents in a number of countries in the region.

“We see opportunities for tank container leasing throughout the Asia Pacific region,” says a company spokesman. “In China, we are celebrating the tenth anniversary of our office in Shanghai. We have seen solid growth of our business in China over the past decade and we expect to see the same in the next decade.

“We also see opportunities throughout Asia Pacific beyond the traditional chemical vertical. These include opportunities in food service, medical and pharmaceutical, mining, transport, construction and building materials and other ‘new’ industries for tank containers.”

Eurotainer says there are opportunities in the future for tank container leasing in emerging countries like Vietnam, India and Myanmar.

“The growth of the industrial base in these countries over the past few years, and the developing transportation infrastructure in these locations, is starting to open up opportunities for bulk transport of liquids and gas products.”

The company’s clients come from a variety of industries, including mining, chemicals, food production,



Raffles gave a great deal of thought to the design of the tanks it ordered

pharmaceutical and transportation services, says the spokesman.

“Our tank containers are used for storage and for transport within Asia and also for export to other regions and imports from these other global regions.

“Eurotainer has been in Asia Pacific for many years. Our clients turn to us for our technical expertise, our wide variety of different tank specifications and the customer service they receive from our personnel in the region.”

In a recent interview, Eurotainer’s General Manager for Asia, Claus Ringgaard, said: “The region has provided solid growth for us and over the last ten years we have tripled our business in the Asia Pacific region.

The strategy we use in Asia Pacific is, of course, in line with what we use worldwide – so we are focused on the special cryogenics and gas tanks, and we focus on providing solid technical solutions optimised for the customer’s needs.”

As part of its strategy to constantly expand, Eurotainer is looking at new opportunities and new areas in the region, he said – the most recent example being the

opening of the office in Tianjin.

For Noble Container Leasing (NCL), formerly Sea Axis, acquisition by the Germany-based investment manager ConRendit Group last November will prove key to its expansion plans.

ConRendit has become the ‘backbone for the future development of NCL’, says Noble’s Managing Director, Lily Li.

In May 2014, NCL acquired 75% of the shares of Singapore-based Global Container Rental, and it is now expecting further expansion into the Far East for tanks, dry vans and specials to provide additional services to its growing customer base in the Asia region, says Li.

Headquartered in Hong Kong, NCL’s offices in the region are in Shanghai and Singapore. Globally, the company has a fleet of 30,000 TEU, including dry boxes, dry specials, reefers and tanks.

“With our access to equipment funding via ConRendit, it is our clear intention to substantially grow the scope and volume of the business over the next years to become a well-established player in the container leasing market,” says Li.



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# Growth fuels demand

## Editor Leslie McCune reviews the many opportunities for tank container growth in China

We live in a world of percentages, with absolutes often being too large to comprehend. Consider China, now the world's largest market for chemicals and one of the fastest-growing markets for tank containers. Current economic and industrial indicators fail to provide reassurance that the reform initiatives of Premier Xi Jinping will successfully transition the country away from an investment-driven, export-led economy to one based on local demand.

Annual growth of anything less than 7% will awaken the fear of a 'hard landing' for the Chinese economy. This would cause global stock markets, oil prices and chemical demand to dip.

A banking crisis in China would have the same contagion effect, but with potentially greater impact, causing China's currency to fall in value, making exports more competitive.

Société Générale believes a 'hard landing' in China would result in annual growth of as low as 2% which, it warns, would reduce global GDP by 1.5%.

Much of the financial commentary would focus on a growth outcome of 7% being the lowest growth rate since 1990, according to data at the World Bank. But China's GDP in 1990 was only \$390 billion. Roll forward to 2013 and China's GDP was \$9,240 billion – the same growth of 7% was \$643 billion in absolute terms, equivalent to the GDP of Switzerland or 80% that of Saudi Arabia.

Growth is being stimulated by international industrial transfer from the US and Japan to Eastern China, although the low energy and new sources of petrochemical raw materials associated with the shale gas revolution in the US is diverting some foreign direct investment back to the US.

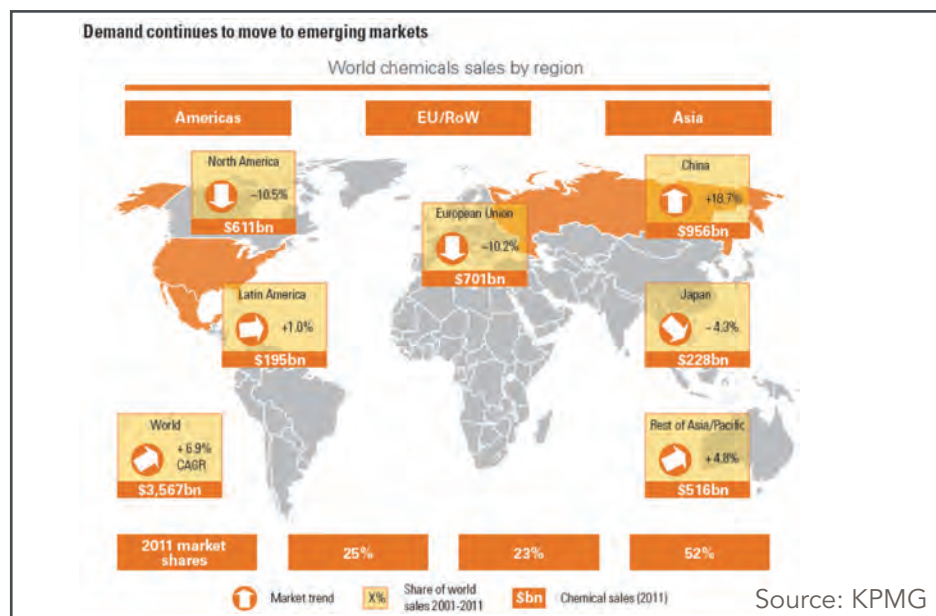
However, the search for lower cost labour and new sources of raw materials is transferring some industrial activity from Eastern China to the inland provinces – many of which are growing at double the national rate – and to South-East Asia, Africa and, increasingly, South America.

As Jim O'Neill, Head of Asset Management at Goldman Sachs, famously said in 2012 "China's growth was producing an economy the size of Greece every 11½ weeks".

In 2012, the worldwide sales of chemicals were \$3,600 billion (see chart below). China dominated global demand and accounted for 26% of overall chemical consumption, according to KPMG.

For the tank container sector, therefore, China is the essential player in Asia. But things get complicated quickly – routes to market (and therefore supply chains) are complex, intermodal infrastructure (essential for tank container usage) is under-developed in many areas and regulations are inconsistent between provinces.

Consider one of the large users of tank containers – chemical distributors. The very existence of multinational distributors depends on their ability to move chemicals in smaller lot sizes around the world. Many are major customers of tank operators and tank leasing companies and yet China is proving to be a challenging market for them to enter. Although one of the fastest growing and largest chemical markets, China does





not have the network of inter-connecting chemical feedstock pipelines that reduce chemical production costs dramatically in the Middle East, Europe and the North America. Instead, chemical production is clustered in seven areas, each of which is essentially a huge industrial island. Rail is often used for chemical movements between these sites, and to the major consumer regions.

With annual growth rates of up to 9% in specialty chemicals, China should be a fertile market for multinational distributors and yet few multinational distributors - with the exception of industry leaders Brenntag (\$12.8 billion sales from 450 locations in more than 70 countries) and Univar (\$10.3 billion sales from 260 global distribution facilities) - feature in the distribution landscape in China.

Analysis by Strategy& shows that the distributors market in China is very fragmented. The top 10 distributors have only 15% of the marketplace compared with 50% in Europe.

Sinochem is the biggest distributor. It is also a major player in the tank container market and both operates and leases equipment. Five years ago, Sinochem had 3,000 tank containers and was the only domestic tank container operator moving butylene glycol, epoxypropane and methyl phenylene diisocyanate.

Intermodal infrastructure remains underdeveloped in China - one reason for the massive investment in ports and rail.

Important rail reform is under way in China. From March 2013, the Ministry of Railways was replaced by China Railway Corporation, which will now be able to supply a forwarding agent and management service for intermodal rail deliveries. Administration of the railways will be done by the Ministry of Transportation with

the National Railway Bureau being responsible for quality, regulations, etc. There will be more explicit regulations covering the movement of dangerous goods with some old, ambiguous regulations being revoked. For the first time, there will be specific regulations for tank containers.

One of the main movers by rail is the Beijing China Railway Multimodal Transportation Company, which had a fleet of 13,000-14,000 tank containers of various types in 2012. This included 5,000 for solids such as cement. Most of the rail fleet is specially strengthened and new ellipsoidal tank containers have been developed with a maximum gross of 36,000 kg and capacity of up to 24.9 cu metres.

China's move to 'Coal-To-Chemicals' processes - one of the officially designated 'key developing industries' - has stimulated new opportunities for tank containers in the central and western regions, with one project alone requiring 1,200 tank containers.

Western China is set have massive demand for liquid freight. Rather than simply processing the raw materials for fabric manufacturing, China can be expected to back integrate into the manufacture of the raw material. Tertramethylene glycol, for example, is used for fabric production and is in chronically short supply. Annual production capacity in China of 1.2 million tonnes will increase to 2.7 million tonnes by the end of 2015. Much of this production will be exported to fabric manufacturers in Asia in tank containers.

New port projects in North-East and South Asia will create new capacity for trade with China. Higher volumes of chemical trade will stimulate demand for tank containers on the intra-Asian routes.

"Asian countries buy more from each other than from

Europe and the US and older ports in many parts of Asia are increasingly unable to cope with higher volumes of petrochemical cargo," a shipping source says.

The trend to larger deepsea vessel sizes further restricts the Asian ports. The average vessel size in the global cellular container fleet increased by over 7% in 2013 on Asia-Europe routes compared with 2012 and by 6% on Asia-US east coast routes. Globally, the average vessel size of the 'Top-200' container vessels has increased by 10,000 TEU over the past 20 years.

Congestion is frequently caused by an inadequate number of berths, especially during the holiday season or poor weather. This increases operational costs, as freight rates typically increase to compensate for these delays and demurrage costs - an important source of revenue for tank container operators - escalate. Last year, problems at the ports in Taipei, Ningbo, Tianjin, Ulsan, Yeosu and Daesan caused freight rates to increase by 20%.

With deepsea freight rates, three trends have emerged: the cycle time between rate peaks and troughs has shortened (*see chart on p33*); larger deepsea vessels are being cascaded into intra-regional trades at an increasing rate; and the freight rate declines have become increasingly steep.

Shipping alliances are one solution to dampening volatility, but China's influence on their formation is key. Although US and European clearances were granted to the P3 operational alliance between three European shipping giants (Maersk, CMA CGM, and MSC), it failed to get approval from China's Ministry of Commerce.

The alliance was designed to optimise the resources of the three container shipping companies on the P3 Network, which would have included 29 loops on the three major tradelanes on the east-west routes (Asia-Europe,



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transpacific and transatlantic).

The trend to larger vessels is in turn stimulating investments in coastal chemical shipping and bulk liquid storage facilities. Those interested in identifying the future locations of chemical trading activity might usefully follow the investment locations of the major bulk liquid chemical storage companies.

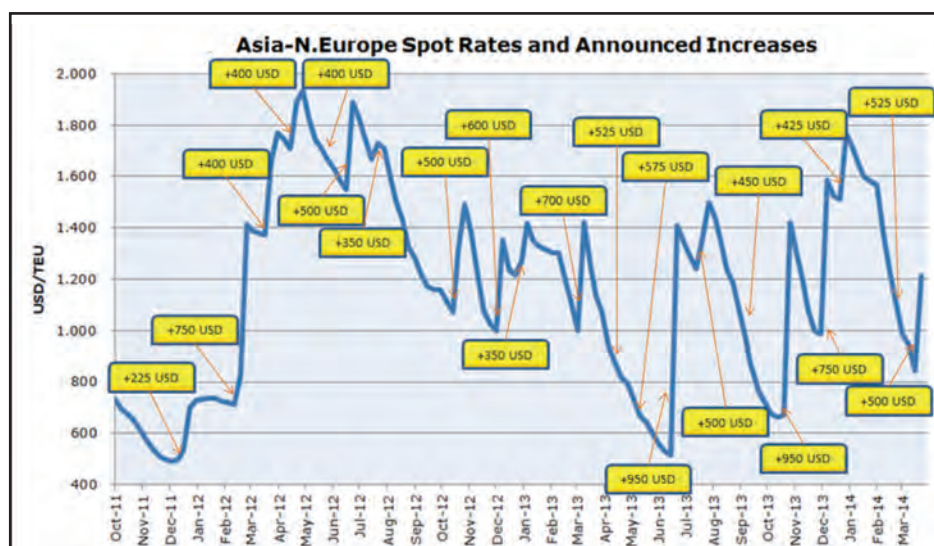
Vessel bunker costs doubled from \$330 per tonne to \$665 per tonne between 2007 and 2012 before falling 5% in 2013. Despite this dramatic increase, bunker costs on a per TEU basis actually fell over the period, with 2013 averaging \$200 per TEU. This was due to the reduction in bunker consumption by slow steaming and an increase in the average vessel size.

Overall, global tank container operators will be faced with continued structural overcapacity for vessels, reasonable strong demand (but not enough to soak up shipping capacity), continued pressure on freight rates, a continued focus by shipowners on cost (resulting in poorer service consistency and on-time performance) and larger ships.

Meanwhile, Chinese financial interest in tank containers is developing on several fronts, including involvement in operating, leasing and manufacturing.

For example, in 2011, one of the largest logistics companies in China, Sinotrans, took a stake in InterBulk, now the fifth-largest global tank container operator with 10,750 units and Europe's leading provider of intermodal 30' 'bag-in-box' containers for the movement of dry bulk products. InterBulk's dry bulk business in Europe has been negatively impacted by the closure of commodity polymer businesses. Continued weak end-user demand in many key European markets and low cost Middle East polymer imports are features of today's market.

Sinotrans now owns 35.3% of



Source: SCFI data from Shanghai Shipping Exchange

InterBulk with Hoyer – a tank container rival – owning 15%.

In July, Bohai Leasing (owned by HNA Group of China) signed a memorandum of understanding to acquire 80% of Cronos – one of the world's top-tier tank leasing companies. Bohai already owns container leasing company Seaco. The deal will create the world's largest diversified fleet of containers with more than 3.4m TEU. Post-acquisition, the brands are likely to merge.

Cronos raised over \$600 million in 2012 and 2013, with major banks 'lining up to invest more', according to an industry source.

Tank container leasing is now viewed as one of the least risky bases for securitisation because purchase prices are low (averaging approximately \$21,100 in 2013 according to ITCO, the 120-member tank container organisation). Future lease revenues are guaranteed for an extendable period of typically five years and terminal values for tanks are relatively high.

As a result, leasing companies can often fund their businesses more cheaply by securitising the guaranteed future income from their customers – i.e. by selling their claims to those future payments at a discount to willing purchasers in the financial community.

Lastly, China is now by far the largest tank container manufacturer in the world. China International Marine Container (CIMC), the largest manufacturer in the world with revenues of \$530 million in 2013, first started manufacturing tank containers in 2001 and now, just over a decade later, produces approximately half all the tank containers manufactured in the world. CIMC's first customer was leasing company Cronos, whose initial order was for 100 units. Cronos has since gone on to buy over 20,000 tank containers from CIMC.

ITCO estimates that 32,510 tank containers were manufactured by the nine manufacturers in China in 2013 (including the 250 units manufactured by Qighar/China Railways). China therefore manufactured 76% of all the world's tank containers in 2013. According to ITCO, there were 394,400 tank containers in the global fleet. Of these, @ tco – a non-profit organisation encouraging the safe usage of tank containers in Asia Pacific – claims that nearly 5% of the global fleet are operated in China.

So, as in many sectors, China's influence in the tank container market is set to grow ..... but watch out for that banking crisis.

# BDP plays double-up

**BDP began as a straightforward bricks-and-mortar freight forwarding company in Pennsylvania, US, founded by Richard Bolte Sr in 1966. It became BDP International in 1972, writes Jaap Huigen**

Today, BDP is headquartered in Philadelphia and led by Chairman and CEO Richard Bolte Jr. The company is now one of the largest privately-held global chemical logistic services providers in the world and is most widely known as a lead logistics provider.

It has had a long involvement in the chemical sector and benefited from the rise in demand for lead logistics providers as chemical manufacturers outsourced their logistics operations to supply chain specialists offering end to end services.

BDP neither operates nor leases tank containers but employs more than 3,700 supply chain professionals throughout its 300 global offices. Over 133 offices are owned (or are joint venture offices) and there are an additional 195 offices in BDP's Global Network group.

With a presence in nearly 135 countries around the world, BDP



In the global chemical sector, BDP manages over 1.5 million TEU a year on behalf of customers, equivalent to approximately 120,000 movements

serves more than 4,000 customers worldwide, including Dow, DuPont, Eastman, Honeywell, DSM and Johnson & Johnson.

As expected, BDP executives are trained in MSDS usage, IMDG regulations and the local regulations in each of the countries of operation. It also staffs a full-time hazardous materials unit and has been a Responsible Care partner since 2001.

The company is a so-called 'asset light' operation, explaining: "It is simple really - good supply chain management strips away time and cost from cargo delivery cycles. To this end, the focus is on all cost, control is emphasised and end-to-end visibility is created."

BDP condenses its supply chain management expertise and business intelligence into interactive business platforms, business tools and analytical systems. These are used to reduce costs, increase efficiency and/or increase the supply chain performance of its customers.

In June, the company celebrated the 20th anniversary of their presence in Singapore. The

theme was 'One BDP'.

Chairman and CEO, Richard Bolte Jr. praised the Singapore team, led by General Manager David Poh, a BDP veteran with 12 years of service.

In the global chemical sector, BDP manage over 1.5 million TEU a year on behalf of their customers, equivalent to approximately 120,000 movements.

Its role varies and can be either transactional (with shippers) or as a facilitator (providing documentation for tank container shipments, such as the preparation and processing of operators' in-house bills of lading). The company's global customs brokerage services are often the point of entry for new customers.

BDP's Smart Tower is a resource for tank container operators. With an average cost of over \$21,100 in 2013, according to the International Tank Container Organisation (ITCO), tank containers are valuable assets and require close monitoring to ensure they are operated economically and used efficiently.

Smart Tower delivers asset visibility and tracking, and helps



to maximise utilisation. The tool captures the sequential changes to equipment status and enables operators to take under-utilisation out of their fleets by minimising turnaround times while tracking statutory test requirements, cleaning and repairs.

Apart from Smart Tower, BDP also offers BDP Smart and BDP Smart V. BDP Smart gives constant visibility of a customers' entire international order execution process – it provides both strategic and tactical visibility.

Strategic visibility is achieved by providing an assessment of how a customer's various supply chain partners are performing. These partners typically include forwarders, ocean carriers, warehousing and distribution centres and, if desired, the customer's own operations. Weak links in the supply chain can be identified and addressed. The data can be used when negotiating with suppliers, such as ocean carriers.

Tactical visibility enables front-line personnel to identify and manage potential supply chain disruptions. For example, if a shipment from Asia to the US is delayed due to weather or an equipment breakdown, an early warning gives customers an opportunity to quickly adjust. Based on a 'management by exception' philosophy, the information can be shared with minimum delay with the receiving party.

BDP also offers its global customers the convenience of mobile access to its BDP Smart 3.0 online customer service portal, which is called BDP Smart Mobile.

BDP Smart V is a purchase order power tool which turns vendor handling and performance data into business intelligence.

Arnie Bornstein, Executive Director of Corporate Communications, says: "Caring never goes out of style. Often, when BDP has been executing



Chairman and CEO, Richard Bolte Jr praised the Singapore team

superior service over a period of years, we earn the opportunity to move up the value chain to strategise, benchmark and deliver service solutions to our clients' increasingly complex challenges."

"Trust must be earned over time, one customer at a time. The comfort level is a natural outcome of fulfilling our service promise and going the extra mile to deliver unexpected value. BDP People get that, and our customers experience it."

Bornstein sketched a perspective about competitors: "BDP hold their own amidst what are highly capable logistics providers of different stripes and competencies that serve the chemical sector in nearly every region of the world.

"While there is no single definitive measure, according to a leading chemical industry publication, BDP serves eight of the world's top ten chemical producers. BDP clients and companies conducting trade on a global scale first and foremost want unmistakable reliability. They want the peace of mind that comes with knowing

BDP is vigilantly watching over their shipments. BDP has struck the right balance between serving as transaction providers and business process managers."

So where next for the company? Bolte says: "For BDP to grow, we need to meet more of our customer's needs, solve more of their problems and show them new ways to make their logistics functions contribute to their bottom-line. This means BDP needs to broaden the relationships with our existing customers as well as win new ones. Our goal is ambitious - to double the size of the company by 2018."

The dynamics of the global petrochemical sector are changing. The Middle East and the US are becoming ever more important. In the US, the growing availability of competitively-priced natural gas and oil extracted from shale formations has stimulated over \$100 billion of investment.

Energy costs have fallen as a result - US electricity costs are approximately 5.5 US cents per kWh, compared with 20 US cents per kWh in Europe, according to Reuters.

BDP hopes to benefit from the US petrochemical and industrial manufacturing renaissance and leverage its global network to exploit the undoubted opportunities for petrochemical logistics services in the high-growth regions of the Middle East and Asia.



# China is still on top

The Chinese tank container building industry has gone from strength to strength in recent years, having dominated global production for almost a decade

Chinese companies are currently meeting nearly 85% of worldwide tank container output, with further gains in recent years in both the volume-orientated and more specialised market segments. Several of the six established Chinese producers have increased their plant capacity, which now exceeds the world's entire demand.

The collective capacity of the manufacturers in China is now over 40,000 tank container units a year. With a global output of 35,000-40,000 units, China has a significant surplus of tank container manufacturing capacity. Nevertheless, more than 45% is held by the market leader, CIMC Group, whose Enric division has a major site in Nantong.

Nantong CIMC Tank Equipment Co has been the world's largest producer of tank equipment for more than a decade. The company has delivered over 100,000 ISO maritime tank containers in its short history and, alone, has contributed the equivalent of nearly 30% of the world's entire currently-operating fleet. CIMC Enric designs, engineers and manufactures equipment for three main industry areas: energy, chemical and liquid



foodstuffs. The tank container manufacturing division accounts for a sizeable proportion of all the company's business in the chemical equipment sector.

In 2013, CIMC Tank generated sales of RMB 3.3 billion (US\$530 million) from its chemical equipment development and manufacturing activities. Sales for the first half of 2014 were RMB 1.6 billion (US\$257 million). The majority of sales came from tank container construction carried out at Nantong – production has been over 15,000 units a year in recent years. Revenue from the chemical equipment division grew by 7.7% in the first six months of 2014, compared with the same period in 2013, with the increase attributed to growth in tank container demand. A recent project centred on the development of a 40ft ISO tank version, rated to 39-tonne maximum capacity and designed for LNG (Liquefied Natural Gas).

CIMC's biggest rival is Singamas Holdings, whose tank division has been upgraded and expanded in recent years. The company's tank

container factory, in Shanghai, was opened in 2010 after the previous site, Shanghai Pacific International Containers (SPIC), was converted from dry freight to tank manufacture. The single production line has a capacity to manufacture 10,000 marine tanks annually and delivered 4,000 in 2013. The projection for 2014 is for 5,000 tank units to be constructed.

Singamas holds a 60% stake in the current SPIC plant. All the tank container production previously carried out at Foshan Shunde Singamas Tank Container Co in southern China was formally ended in early 2013, following the sale of the company's 100% stake holding in the site to Guangdong Fuwa Machinery Holdings Co in October 2012. All outstanding orders were relocated to the new SPIC factory in Shanghai.

Singamas – in line with CIMC Enric – offers most of the regular-type tank containers but includes several specialised models. Most are sold to the major tank-owning companies, lessors and operators.

A more recent Chinese entrant



is the CXIC Group, which has produced stainless steel tank containers since 2009 at its dedicated plant, Tianjin Xinhuchang International Co Ltd (TXIC) – a joint venture with Bendix Transport Corp. The initial investment in the factory was US\$50 million, including US\$48m in fixed assets. TXIC, which can build up to 6,000 tank containers a year on a double-shift process, is located in the Ninghe Economic Development Zone in Tianjin. A larger dry freight manufacturing plant was opened at the same site in 2012.

TXIC has been granted 23 patents covering its IMO product range and can produce T1 to T22 tank instruction types. Production has increased during the past three years and there are now more than 30 major customers, including top leasing and bulk liquid transport/logistics firms.

Nantong Tank Container Co (NTtank) was founded in 2007. The firm is a wholly-owned subsidiary of Nantong Freezing Equipment Co and claims a current annual rated capacity of around 6,000 ISO tank units. Output has been stepped up progressively in recent years, following the upturn in 2010, to more than 4,000 and supplies many of the world's leading tank lease companies.

Despite being smaller than Nantong CIMC Tank Equipment, its nearby competitor, NTtank has become the third largest tank producer in the world and has continued to add new models to its growing product range. It supplies high-capacity swap-tanks for the European sector, as well as designs for gases and specialist products (such as aggressive chemicals). Heated/insulated, refrigerated and offshore types are also available.

The company remains bullish about the future as well, citing a significant – and ongoing – growth in the use of tank containers for transporting dangerous

chemicals, both globally and within China, as end-users become increasingly focused on safety and environmental issues. This has helped to boost demand and keep production volumes relatively high.

Nevertheless, as stated by company representative, Jenny Guan, the current tank market remains oversupplied and, “as a tank container manufacturer, we still face fierce price competition all the time”. Tank container pricing has been held down since the market revival of 3-4 years ago, in part because of a sharp decline in the cost of stainless steel since early 2012 but also in reaction to the increased size of the Chinese tank manufacturing industry.

Zhongshan Zhonghua Tanks Containers (ZZTC) is another longstanding Chinese producer of tank containers and one of the first to attain international ISO accreditation. It is located in Zhongshan City, in the Pearl River Delta – close to Hong Kong – and has a capacity to manufacture 1,000 tanks a year. Although smaller than its main Chinese rivals, ZZTC has been in business for more than a decade.

The company underwent an ownership change in 2010, when specialist engineer and manufacturer of offshore tank equipment Suretank Group (of Eire) acquired a majority shareholding in ZZTC's Hong Kong-based parent company. It controls a 100% stake in ZZTC, which is therefore the only tank builder in China owned and managed by European interests.

Suretank was founded in 1995 and has focused on specialised tank and other container equipment for use in the global offshore oil and gas industries. It is the largest manufacturer of DNV 2.7-1 certified products, for offshore application, and the only firm to produce all its products to DNV standard.

Since 2010, the group has been manufacturing its more bespoke

models at the ZZTC site, with production increasing in 2012. ZZTC's location in southern China is strategically important, being close to the Russian Federation and Asia Pacific regions where the reserves and exploitation of offshore oil and gas are, and will be, considerable.

As a result of the takeover, ZZTC has been rebranded as Suretank China and still serves the more mainstream 10ft and 20ft UN portable tank containers, as well as other designs adapted for heating/cooling or the carriage of hazardous powdered materials. Its wider range further includes ‘jumbo’ and mini-sized tank units and various lined versions.

Jiangxi Oxygen Plant Co (JOPC) was established in 2006 by Hangzhou Hang Yang Co and Ningbo Huarui Investment Co. Its former incarnation, Jiangxi Oxygen Plant Manufactory, was focused on more general container production. The successor company has since concentrated on the development and manufacture of specialised tank equipment, including cryogenic models for LNG and other various liquefied/frozen gases. Production has been sold to both overseas and domestic customers, supported – according to JOPC – by the company's advanced product design and quality, competitive pricing and developed aftersales service.

JOPC has also produced a hazardous chemical-carrying version for the transport of refrigerated/liquefied chlorine gas and for anhydrous hydrofluoric acid. The latter has been supplied to customers in Japan, South Korea, India, Taiwan, Russia, Singapore, Venezuela and other export countries, as well as domestically in China. JOPC is located in Jiujiang City on the Yangze River and is close to the Beijing-Kowloon railway. The factory occupies a site of more than 200,000sq metres and employs 400 technical staff.

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# Asset management and the Asia effect

**Rapid growth in the global chemical trade has kept software company RAM Intermodal busy this year, writes Mike Wackett**

RAM Intermodal, part of Real Asset Management Group, is a specialist supplier of software for both tank container operators and lessors. Interest in its products – and in RAM's order book – is at a record high.

RAM dates back to the 1980s, when the company first recognised the growing need for asset management systems – at that time it specialised in asset accounting and asset maintenance.

In 2001, RAM acquired a small, 10-customer company that took it into software for managing assets in the intermodal market. Subsequently, this part of the business was expanded and RAM now implements its operating and leasing products at more than 100 customer sites worldwide.

Marketing Manager Nicola Byers and Sales Director Richard Shaw cite a doubling of enquiries, driven by organic growth in the businesses RAM serves and developing interest from Asia in RAM's competitive proposition.

Larger tank container operators have expanded their global operations significantly, creating



Leasing companies and tank container operators can use asset management software to minimise the time and cost of getting the right container types to route start points, maximising unit utilisation and increasing profitability

new subsidiaries and/or opening new offices throughout the world – most commonly in Asia and South America.

In addition, some dry box operators and leasing companies are expanding their operational scope to incorporate tank container services.

Textainer, for example, is by far the world's largest container lessor, based on fleet size, with 1.9 million general purpose box containers, equivalent to 2.8 million TEU. It recently signed an memorandum of understanding agreement with Trifleet Leasing under which Textainer will invest in new intermodal tank containers to be managed by Trifleet. Trifleet will acquire and lease the containers on behalf of Textainer, serving as its exclusive manager in the intermodal tank container market.

And several new companies have entered the tank container market, offering either tank container leasing (for example, Raffles) or as local or regional operators.

As we report elsewhere in this issue, China is now the world's largest manufacturer of chemicals. This is stimulating demand for tank containers.

Shaw says the Chinese market for tank containers has developed as much in the past five years as it did in Europe in the past 30. Previously, European majors had small branch offices in Asia, often in partnership with Chinese companies. These competed with each other for the local market. Now, however, competitors include many indigenous operators.

The larger Chinese tank container operators are also branching out into the container leasing

market. They mainly own the units and cover demand peaks by renting other units for specific jobs from leasing companies.

However, RAM has noticed a trend over the past few years of operators over-stocking for their anticipated needs. This both reduces their own job costs and provides them with a new income stream by renting out excess stock.

From RAM's perspective, more employees and more market entrants have translated into more enquiries for RAM's software licences and services.

RAM's competitive proposition has developed, Shaw explains, as the market has become more competitive. IT is being used much more to create a competitive edge. For example, optimising administrative workflows and ensuring ready access to quality management information both reduces costs and supports quick decision making.

Operators can be provided with the best options for unit availability, routes and deal profitability, and can respond rapidly to complex requests for quotations.

Leasing companies and tank container operators can minimise the time and cost of getting the right container types to route start points, maximising unit utilisation, reducing repositioning costs and increasing profitability.

So-called 'legacy' office systems – often developed over the years in an ad-hoc manner and run by in-house teams – often struggle to deliver the functionality needed to maintain a company's competitive advantage.

The high cost of employing and retaining skilled technicians to maintain and support these systems has also become a major issue, opening the market to the easy-to-use, advanced systems offered by RAM.

Smaller companies, defined by RAM as having fleets of less



In the past few years, RAM's competitive proposition has developed as the market has become more competitive, with IT playing a major role

than 200 tank containers, often start by managing their fleets using a spreadsheet or even a whiteboard on an office wall.

As these companies grow, a point is soon reached where this becomes untenable. Inevitably, IT systems are then deployed. The increase in enquiries has led RAM to increase its resources.

"We've almost doubled our headcount in the past 24 months and invested heavily in training and new modules", says Shaw.

"Implementing important front office systems is very different from installing more basic IT office products, so we're fortunate to have some great people with excellent industry knowledge."

In terms of the sales process, Shaw says that RAM first understands a customer's core workflows and information requirements so that its software can manage these more effectively.

"Our role is to match our software products with these work practices and to add value by introducing improvements," says Shaw.

Once a decision is made to partner with RAM, a team of experienced consultants takes over. Its function is to co-manage the project with the customer, devise and execute a training programme, analyse and document data conversion and to ensure a smooth adoption of the new system.

A support team then takes over, holding regular review meetings with the customer and providing that all-important help desk service when it's needed.

RAM systems are constantly upgraded – one recent addition to the suite of software modules is EDI4000, which translates intermodal market standards for EDI (electronic data interchange) messages into data that other products can understand.

Byers and Shaw share the view that world trading levels are only ever going to increase, creating increased market opportunity.

"Our focus will continue to be on helping our customers to maximise profits through our IT products", says Byers.



# Wrap up very carefully

**There are stringent procedures that must be followed when applying tank container coatings, writes Ben Thomas**

Tank containers face some of the harshest and most hazardous environments in the container supply chain, from chemicals facilities to offshore platforms.

Tank vessels and frames must therefore be built to withstand not only the stresses, impacts and climatic conditions experienced during transport and storage/operation but also inherent properties of the chemicals and commodities carried.

Coatings used for both tank vessels and frames are crucial to the unit's overall integrity, reliability and longevity.

Tank frames go up and down ships' cell guides or on and off rail wagons and are subject to bumping and scratching, but they may also come into contact with the liquid cargo if it spills while being loaded or unloaded.

Some specialist fleets of tank containers require interior linings to withstand corrosive chemicals or extreme temperatures. For instance, LNG, liquid nitrogen or ethylene are moved in cryogenic tank containers and ships at extremely low temperatures – LNG boils at -162°C. Conversely, tank containers carrying bitumen need heating, so the coating must withstand high temperatures. Lithcote specialises



Advanced Polymer Coatings is seeing demand in China and India for its ChemLine lining for the carriage of high value Class 8 corrosives

in coating the inside of tank containers for chemical resistance and claims that while growth in this specialised sector does not move dramatically, demand is growing steadily with the market increasingly focused on Asia.

According to Advanced Polymer Coatings (APC), which produces ChemLine coatings, business is "buoyant" and it expects year-on-year growth over the next five years.

"There is a demand for linings for high-value, highly corrosive Class 8 corrosives, specifically in China and India where these are predominantly manufactured," says Martin Kilroe, global tank container manager at APC. "As long as the chemical industry is producing Class 8 corrosives, there is a need for linings in tank containers."

ChemLine has a "unique"

cross-linked polymer structure that prevents the chemical cargo permeating the lining, providing corrosion protection and ensuring product purity.

Lithcote, meanwhile, has developed a method of curing coatings without the need to first remove the tank container's insulation. The firm's Christophe Leclercq adds: "We now have the ability to make Teflon-coated tank and the chemical resistance of such containers is extraordinary."

The company particularly prides itself in providing bespoke coatings solutions for specialist projects. "We have worked with nearly all the major chemical manufacturers, moving their most aggressive corrosives," he explains.

While coatings specified for the frames of tank container are usually very similar to the dry van container

sector, some fleet operators are specifying more specialist coatings. Cost is usually the driving factor when choosing the frame coating, according to Philip Eastell of coatings supplier Chugoku. "Some operators prefer PU [polyurethane] as it's more resistant to abrasion and chemical attack, whereas others might prefer acrylic as it gets the job done and it's cheaper," he explains. "We're seeing that the real specialist tank owners – not the everyday leasing company, but specialist owners – trying to find coatings that are more resilient for the cargo that's being carried."

"For chemicals or products in the pharmaceutical industry that they ship in tank containers, we can develop a coating for the tank frame that is more resistant to damage, if it were to get accidentally sprayed or covered."

One factor that is driving change in the coatings sector is increasing environmental awareness. "In China, there is a strong political process that recognises container manufacturers produce a lot of emissions in their own right," says Eastell. "Chinese local governments are trying to implement a process of reducing volatile organic compounds (VOCs) going into the atmosphere. VOCs are primarily emitted by the solvent-borne paints, which is why we're going down the route of waterborne paints."

"Tank containers account for a minor proportion of all the container production in China so the impact on the environment from tank containers, specifically, is not huge. But as tank containers are built by large manufacturers like CIMC, they are very CSR-aware (corporate and social responsibility) and are therefore implementing procedures. So the tanks by default will get more environmentally-sound coatings as a by-product of what the container manufacturing company is doing."

The crucial element for the



Lithcote has developed a method of curing coatings without the need to first remove the tank container's insulation

coatings industry is ensuring the application is carried out correctly. "It is very difficult to achieve a coating, in particular because of the hot curing," says Leclercq. "Differences of massiveness in the metal can generate micro cracks if the techniques are not fully mastered."

Coatings suppliers therefore work very closely with the applicators and tank container manufacturers. Many of these relationships are very long-standing, with coatings producers strategically located near the container manufacturing locations with supply chains in place to deliver coatings within 24 or 48 hours.

In Europe, APC has worked with specialist tank container coatings applicator Hüni for a decade. APC provides the ChemLine 784 coating while Hüni ensures proper surface preparation, application and heat curing. After application, careful and controlled heat curing takes place, with thermocouples strategically placed in the tank, transmitting temperatures to a chart recorder. A graphical representation of the recorded data is produced to prove the time/temperature correlation in line with the quoted specifications.

Hüni closely monitors quality throughout the application process and prepares data dossiers for customers requiring evidence of compliance. These include recording of curing temperatures and times, visual inspection of the tank container, layer thickness measurements (around 100 measuring points per tank container in the final test), certification according to DIN EN ISO 9001, spark test with high voltage in accordance with DIN 55670-A, testing and recording of the electrical conductivity and work certificates.

As well as on-time arrival, it is important that coatings reach the applicator/tank container factory in the right condition, which requires suitable on-site testing and record keeping.

"We make checks of our own paint," says Eastell. "So if it's a zinc-rich primer, we take samples before it's applied to container frames, to make sure that it's the same quality and condition as it was when it left our factory,"

The viscosity of coatings is checked to make sure it will flow correctly through the pipes on the container factory's paint line. The coatings supplier will also conduct





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checks on the paint lines to ensure they are clean and dust-free with sufficient light and ventilation.

"In terms of the actual application of the coating itself, we keep very specific detailed records, taking careful checks of the metal to make sure it's not pitted and making sure there is no other contamination such as oil," explains Eastell. "Our people probably take more time checking that the metal is ready, than watching the paint go on, so preparation is critical. Metal must be cleaned, degreased, shot-blasted and cleaned again."

During the application process, a number of testing procedures are carried out but, perhaps most important, are the checks on the wet film thickness and, when it is dry, the dry film thickness (DFT). "The DFT is in clients' specifications, so the key is to ensure the factory applies the right thickness," says Eastell.

Everyone in the process has a vested interest in the tank container: the coatings supplier, the container factory, the classification society or the end user. So, for example, Chugoku pays attention to the welding on the tank container. Eastell explains: "If the welding is bad, then paint will not adhere to it and if that becomes a weak point on the paint surface, then moisture will get in. So we take a lot of interest in the whole process and the condition of the tank container."

Kilroe, too, emphasises that APC's procedures, when it comes to tank container linings, are equally stringent. "It all starts with a fabrication inspection of the substrate, checking for the presence of soluble salts, blast to Sa 2 ½, carry out Perthometer checks, monitor environmental conditions, check DFTs, monitor overcoat window, visual inspection, holiday detection, heat cure, solvent wipe, and hardness

test. We have a specific set of application procedures that our partner applicators are trained in and continuously monitored."

Coatings must be applied as a continuous film to perform their intended function and avoid early failure, which will occur if there is a discontinuity, known as a "holiday". This could be a pinhole, void, crack, thin spot, foreign body or contaminant in the coating. Many such defects are not easily visible, but they can be identified using holiday detection equipment, which uses electricity to locate discontinuities.

**Coatings must be applied as a continuous film to perform their intended function and avoid early failure**

This test is primarily carried out when the coating is designed for critical service such as chemicals.

Coatings are generally insulators whereas the steel substrate is a conductor so if there is a holiday, there will be a pathway for current to flow. Some coatings, such as zinc-rich primers, are good conductors due to the zinc particles and so holiday testing cannot be carried out on them. But it can be done after a topcoat of non-conductive coating has been applied, but this will only detect holidays that reach just to the primer.

It is important to know the dry film thickness as low-voltage holiday detectors can be used on coatings thinner than 500 microns (0.5 mm), with high-voltage equipment used for thicker DFT. A coating must be sufficiently dried/cured before holiday testing because retained solvents can corrupt the results. Coatings

suppliers will advise the applicator/tank container factory when a holiday test can be carried out.

Records of the coating process are kept by a variety of stakeholders in the production of tank containers, including the container factory, the end-customer's inspector and the coatings supplier. "Records are archived in case of future claims regarding failure or breakdown of the paint system," explains Eastell. "We keep very detailed records on the quality of the metal when it arrives at the factory, the blasting of the metal, the profile that's achieved and the primary preparation of the metal before we start applying our primer."

Leclercq says: "Everything is recorded, which allows us to have a traceability of each coated tank." Kilroe adds: "We keep detailed data books during the application of environmental conditions, DFTs, QC information, etc. A ChemLine coating is two-fold – the chemistry involved that produces the corrosive resistance and then the application. They both need to be done correctly."

Despite the relatively small size of the tank container industry in relation to the overall container business, and the fact that its coatings sector is a well-established industry, the coatings suppliers continue to innovate. "Further increasing the chemical resistance of the product would be a great step forward," says Leclercq. "We are working with a laboratory for the creation of a new type of resin."

However, with regard to tank frame coatings, Eastell cautions that innovation is related to what the market will pay and the benefit. However, he adds: "If we build on the back of existing marine coatings, which is typically how container coatings companies work, we can develop new coatings to benefit our customers in the tank container sector."



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