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FEATURES

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- Pulp
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Grain import demand may recede

In many dry bulk commodity trades there are clear signs of continuing growth. Positive influences are expected to be more than enough to offset any negative changes, ensuring solid expansion. But grain trade is an exception. After a very strong performance in the past twelve months, a reduction seems likely.

Prospects for economic activity around the world are mixed. A modest pick up in GDP growth within the OECD group of advanced economies (mainly USA, Europe, Japan and Korea) contrasts with a slowing pattern among emerging economies including China. A recent World Bank report suggested a gradual deceleration in China's GDP growth to 7.6% in 2014 and 7.5% next year, a prediction which some forecasters view as optimistic.

Grain

Global trade in wheat plus corn and other coarse grains is estimated to have increased at a remarkably rapid rate of 12% during the 2013/14 crop year ending last month. The total, mostly comprised of seaborne movements, rose by 32.1m tonnes to reach 300.7mt, based on International Grains Council estimates, as shown by table 1. About one-third of the rise was contributed by a doubling of China's imports to 19mt.

In the 2014/15 year now starting, flat or lower purchases are foreseen in a number of the countries which saw sharp rises in the previous twelve months. Most of the global decrease in the current year, however, is expected to be caused by a fading of China's import demand. In the Middle East area a slight increase could be seen, accompanied by weakening in North Africa and Europe.

Iron ore

Forecasts of global iron ore trade growth remain upbeat, although this stance is still heavily dependent upon calculations of sustained strong expansion in China's foreign purchases. Among other importers, European countries, Japan and South Korea could see relatively modest additional volumes in 2014.

A revised forecast published by Australia's Bureau of Resources and Energy Economics, at the end of last month, predicted 7% growth in world iron ore trade (including land movements but mainly seaborne) this year. From 1,225mt last year, the total is estimated to grow by 86mt to 1,311mt. More than half of the incremental volume is expected to reflect a 49mt or 6% increase in China to 869mt.

Coal

Despite much greater uncertainty about China's coal import demand in the next twelve months and further ahead, the Asian region is still seen as a growth area for coal, particularly steam coal purchases. In an extended list of importing countries there seems to be potential for extra volumes.

Based on information from several sources, India remains at the top of the list, with one forecaster pointing to a possible cumulative 44% rise over the next four years, boosting the annual total to 230mt. South Korea could see a 24% rise over the same period, to 128mt. Taiwan also is expected to experience growth and, elsewhere, higher volumes in Malaysia, Philippines, Thailand and Vietnam are envisaged.

Minor bulks

Fertilizer raw materials and semi-processed products are a sizeable element of the minor bulks sector. Estimates of seaborne volumes in 2013 — comprising phosphate rock and processed phosphates, potash, sulphur and urea — point to a total of over 130mt, about 2% above the previous year's volume. Signs of further growth this year, possibly 4–5%, have been seen.

Bulk carrier fleet

The Handysize (10–39,999dwt) bulk carrier fleet, contrasting with other size groups, is in a minimal growth phase, as shown by table 2. Following a 1.5% increase two years ago, last year's 1% capacity reduction could be followed by a 1% increase in 2014 raising the total to 88m dwt. Both newbuilding deliveries and scrapping this year are expected to decrease.

TABLE 1: GLOBAL WHEAT & COARSE GRAINS IMPORTS (MILLION TONNES)

	2009/10	2010/11	2011/12	2012/13	2013/14*	2014/15*
Asia (excluding Japan)	50.1	55.5	58.0	58.1	71.9	67.3
Japan	25.4	24.7	23.0	24.3	23.7	24.3
Middle East	42.5	34.9	45.8	48.3	51.6	52.4
Africa	52.6	53.3	59.0	55.5	62.9	60.9
others	69.8	74.3	84.6	82.4	90.6	84.8
World total	**240.4**	**242.7**	**270.4**	**268.6**	**300.7**	**289.7**

*source: International Grains Council, 26Jun2014 *forecast July/June crop years*

TABLE 2: HANDYSIZE 10-39,999 DWT BULK CARRIER FLEET (MILLION DEADWEIGHT TONNES)

	2009	2010	2011	2012	2013	2014*
Newbuilding deliveries	5.5	8.7	10.2	10.4	6.2	5.5
Scrapping (sales)	5.6	2.7	5.3	8.3	6.7	4.5
Losses	0.2	0.0	0.2	0.1	0.1	0.0
Plus/minus adjustments	#VALUE!	0.5	-1.0	-0.7	-0.1	0.0
World fleet at end of year	**76.3**	**82.8**	**86.5**	**87.8**	**87.1**	**88.1**
% change from previous year-end	-0.3	+8.1	+4.4	+1.5	-0.8	+1.1

*source: Clarksons (historical data) & Bulk Shipping Analysis 2014 forecast *forecast*

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Varying steel output affects raw materials

Changes in steel production, seen among the principal raw materials importing countries during the first half of this year, may set the pattern for 2014 as a whole. A general trend of higher volumes has evolved, but growth rates vary widely. In the European Union and South Korea output is picking up, while in China and Japan it is slowing.

Consequences for raw materials import demand and the exporters providing supplies, mostly involving seaborne trade, also vary. But most attention still focuses on China's iron ore purchases, which form by far the largest single element. Chinese ore imports expansion recently has remained very strong, greatly boosting global movements, accompanied by some positive changes in other countries.

Steel production trends

Figures showing steel output in the first five months of 2014 underline sharply differing performances. The divergences reflect contrasts in economic activity, progress in manufacturing industries using steel, and the momentum of construction work. Also reflected are more specific factors determining the relationship between steel demand and output, such as inventory variations.

The biggest percentage increase during January–May 2014, compared with last year's same period, was seen in South Korea, where crude steel production rose by 9%, reaching 30.0mt (million tonnes). On a larger scale, this was followed by the European Union's 5% increase to 73.3mt. In Germany, the EU's largest steel producing country, a similar 5% rise to 18.9mt was reported.

China's gigantic steel industry raised its production by under 3% in this year's first five months, to 342.5mt. However, that calculation may be revised to show a slightly quicker rate when final output figures are eventually published. Growth was also achieved In Japan, although only a marginal (1.5%) increase to 46.1mt occurred.

This pattern may broadly continue over the remainder of 2014. The table below suggests a possible outcome, incorporating some adjustments to growth rates based on expected progress during the year's second half. The group of countries shown comprise about 95% of global seaborne iron ore imports, and about 75% of global seaborne coking coal imports.

Prospects for China

Despite a relatively slow steel production growth rate in the first five months of this year, China's iron ore imports expanded very strongly. Compared with the same period a year earlier, the total was up by a remarkable 60mt or 19%, reaching 382.7mt.

Amid slowing economic activity in China, demand for steel has softened and there have been reports of surplus stocks becoming larger. Signs of slackening consumption in numerous manufacturing industries and in infrastructure and housing construction have emerged. These trends could continue for some time, consistent with government strategy attempting to rebalance the economy towards consumer spending and away from over-dependence on capital investment.

Although the steel production outlook seems fairly subdued, iron ore imports prospects remain very positive. The main argument supporting this expectation points to a continuing market-share gain for imported ore from Australia, Brazil and other foreign suppliers. Large additional volumes of ore entering the international market have already resulted in sharply reduced prices, resulting in lower-quality Chinese domestic ore being displaced.

Last year China's iron ore imports, mostly sea movements, totalled 819mt, comprising two-thirds of global seaborne trade in that sector. In 2014 as a whole, the volume looks set to expand by a large amount. Coking coal imports are smaller but still significant, totalling more than 75mt last year, and could also increase but positive influences are not so prominent.

Outlook for other importers

Among other raw materials importers, an upturn in European steel output has been a prominent feature this year. A slow EU economic recovery appears to be continuing, benefiting steel-using industries, although the revival is widely regarded as fragile and vulnerable to further setbacks. However, it is possible to envisage steel production rising by 3% or more in 2014, after two consecutive annual reductions.

Recently Eurofer, the European Steel Association, published a report indicating that EU steel demand, including some limited restocking, could grow by 3.4% this year. Several industries having a large influence on demand, such as vehicles, mechanical engineering, tubes and metal goods, comprising almost 60% of steel usage, are expected to achieve improved performances.

Confidence about further growth in steel output In Japan is more tentative. An economic recovery has been under way for some time, but there is uncertainty about its future progression. Doubts mainly reflect the effects of the sales tax rise introduced at the beginning of April, which is having, at least temporarily, a negative impact on consumer spending.

Caution about the trend in the period ahead was reflected in an early May survey by a Japanese government department. The compilation of steelmakers plans for April-June 2014 crude steel production revealed that the total could be slightly below the same period a year ago. Previously, there were five consecutive quarterly rises.

In South Korea prospects for a strengthening economy during the current year seem favourable. The Korea Iron & Steel Association reportedly envisages that steel production will increase by about 4%, a solid improvement after a similar reduction in the past twelve months. Higher iron ore and coking coal imports could result.

Richard Scott

CRUDE STEEL PRODUCTION (MILLION TONNES)

Key raw materials importing countries

	2010	2011	2012	2013	2014*	% change**
China	638.7	702.0	724.7	779.0	800.0	+2.7
Japan	109.6	107.6	107.2	110.6	112.0	+1.3
EU -27 group	172.8	177.7	168.6	165.6	171.0	+3.3
South Korea	58.9	68.5	69.1	66.0	69.0	+4.5
Taiwan	19.8	20.2	20.7	22.3	23.0	+3.0
total	999.8	1076.0	1090.3	1143.5	1175.0	+2.8

source: World Steel Association, and Bulk Shipping Analysis 2014 forecasts * forecast ** % change 2014, compared with 2013*

Bauxite & alumina trades

Alumina smelter.

National resource conservation negatively impacts importing countries

Resource nationalism is asserting itself mostly subtly but on occasions bluntly across the globe, *writes Kunal Bose*. Even the countries swearing by free trade principles are too found to be practising resource conservation in ways hurtful for importing nations. For example, China and some other Asian countries did not take it kindly when India, in spite of its large reserves of iron ore estimated at 30bn tonnes, put a spanner in the works as regards exports by charging a prohibitive 30% export duty and simultaneously slapping highly discriminatory railway freight on ore marked for overseas despatch. Another highly resource-rich Asian country, Indonesia, asserted resource nationalism to its extreme on 12 January when it put a ban on exports of bauxite, nickel ore and copper concentrate. The move by the Indonesian government was not unexpected since it went on serving notice over the past few years that exporters would have reasons to regret if they did not invest in value addition chain like alumina refineries or smelters to process copper concentrate.

The export ban has, however, been challenged in Indonesian Constitutional Court, whose verdict is keenly awaited. "Anything that happens to Indonesian bauxite exports will have a strategic fallout for the world aluminium industry. This is because the mineral sourced from Indonesia was used prior to the ban for 10% to 12% of world aluminium production," says India's National Aluminium Company (NALCO) chairman Ansuman Das. He is keeping a close eye on Indonesia for this country is one of the six shortlisted destinations where NALCO is planning to build a 500,000-tonne aluminium smelter backed by a 1,200MW captive power complex. "Wherever the smelter is finally built we will bring the feedstock alumina from our refinery in India," says Das.

For all commodities, including bauxite, that China is largely import dependent, it has fine-tuned a policy of building a strategic reserve if a supply crisis is anticipated. The January ban being on the cards for a long time, China made smart moves to build an estimated 12-month stockpile of required bauxite imports from Indonesia and other countries. But since there will be drawing down of the imported stockpile to run refineries at their present level, the imported inventory will continue to shrink. China is seen making attempts to get extra bauxite from non-Indonesian sources, including Australia and India. In the

building of inventory, China last year brought as much as 42mt (million tonnes) of bauxite from Indonesia alone supplemented by imports from Australia and other countries.

Indonesia turning off exports could not but leave an impact on bauxite prices. After all the country's share of global bauxite market is like Saudi Arabia's presence in the oil market. Goldman Sachs says in a report that the "rise in bauxite prices is quietly under way, with Chinese bauxite import prices rising from $52 to $60 a tonne and non-Australian import prices rising to $68 a tonne from $51." It, however, does not think that bauxite will see nickel's 40% price rally in the post export ban period. Rising bauxite prices, in Goldman Sachs' view, will eventually place pressure on Chinese aluminium producers to "cut production, supporting our medium-term bullish aluminium view." Of the world 2013 aluminium production of 50.196mt, China alone had a share of 24.498mt. Much of the aluminium smelted by China is for domestic use. Its aluminium exports amounted to 1.22mt. The world's second largest economy decided early that, though its own bauxite resource is of poor quality and also not sufficiently large, it must seek self-sufficiency in alumina refinery capacity by importing bauxite in increasingly large quantities. This resulted in China raising alumina production by 13.2% to 41.228mt in 2012 and then by 14.7% to 47.284mt last year. According to CRUMonitor, Chinese alumina production in the first two quarters of 2014 was 24.72mt. Alumina is globally traded at handsome FOB (free on board) rates of $325 to $330 a tonne, thanks to rises in bauxite prices in upstream and aluminium prices in downstream.

According to Yin Zhonglin, director of alumina division of Chalco Zhenghou Research Institute, the Indonesian ban is giving a push to Chinese companies to find new sources of bauxite supply. He informs that as many as 13 Chinese companies have the mandate to "secure bauxite mining projects abroad." Australia's proximity to China gives it a distinct logistical advantage over most other alternative supply sources to meet the major part of growing bauxite requirements of the world's by far the biggest producer of alumina and aluminium. Besides Australia, Guinea and Fiji both with major bauxite resources are also on Chinese radar. Research and consultancy agency CRU says Chinese bauxite imports will see a two-and-a-half-fold increase from 38mt in 2012 to 95mt by 2022. CRU has also come to believe that the global bauxite market is in the midst of a structural change. The world will see the emergence of a number of new junior miners in the market even while Australia will continue to dominate bauxite trade. The country will also emerge as the largest exporter of the mineral to China. An analogy may here be drawn with China's approach to acquiring iron ore assets abroad since like in bauxite, the country doesn't have iron ore resource of good quality. Beijing, therefore, has set itself a target of owning deposits in Australia and Africa mainly to ensure that at least 50% of Chinese iron ore imports in the medium term originate from its owned assets. China's iron ore imports in 2013 rose 10% year-on-year to 820mt.

Unlike China, both in resource size and mineral quality in terms of alumina content and low traces of silica, India ranks in the top tier of bauxite-owning countries. At 3.48bn tonnes, Indian bauxite resource, as has been estimated by Indian Bureau of Mines in 2010, is the fifth-largest in the world. Even then, since the 1980s when NALCO opened the mine with deposits of well over 300mt at Panchpatmali hills of Koraput district in Orissa, the country has not seen the opening of any new bauxite mines of significance. This is because of inordinately long time taken by government agencies to sanction lease rights to

Ansuman Das, chairman of India's National Aluminium Company (NALCO).

deposits. Hosts of forest and environment clearances in which both the central and state governments are involved do not come easily either.

Vedanta Aluminium stands as an example with ownership of a 1mt refinery in Orissa with plans for expansion to 5.5mt being denied access to nearly 100mt bauxite deposit at Niyamgiri hills because of sustained violent protests by local tribals backed by NGOs. Nor has the Orissa government taken steps, as it is obliged under an agreement with Vedanta, to meet bauxite requirements of the refinery from its owned mines. In fact, Vedanta's discomfiture with running the Orissa refinery with bauxite being procured from multiple sources has become a global cause celebre. Hindalco, which owns the world's largest value-added aluminium products manufacturer Novelis, has in the last few years expanded primary aluminium-making capacity in India from 600,000 tonnes to 1.3mt. The company is, however, facing the challenge of opening new bauxite mines and coal mines in the already allotted blocks.

The reforms oriented newly installed government in Delhi appears committed to a transparent mining policy expediting lease approvals and auction of deposits. Mines minister Narendra Singh Tomar has struck the right note by saying he will frame a new mining policy in sync with recommendations and expectations of the country's minerals rich states like Orissa, Jharkhand, Chattisgarh and Goa. Tomar is trying to ensure that mining activities, which came under cloud during corruption infested ten years of the last government, pick up steam quickly to ease the functioning of India's rapidly expanding steel and aluminium industries. He no doubt is committed to investing transparency in allocations of deposits. But the policy needs to be framed in a way as to make mining strictly environment friendly. Rehabilitation of people to be displaced by opening of new mines must get due weightage in the policy. Das makes the point that since energy accounts for anything between 30% and

35% of aluminium cost of production, aluminium makers will ill afford participation in coal block auctions where acquisition cost becomes prohibitively high. "For India to get its rightful place in the world aluminium industry in the context of its ownership of rich bauxite and non-coking coal deposits, we aluminium producers should get coal resource allocation commensurate with our long-term fuel requirements without going through the auction process," says Das. India's other two aluminium producers Hindalco and Vedanta agree with Das. Making a reference to Canada, Das says the country remains committed to using its "abundant hydroelectricity to remain a key global supplier of aluminium and value added products. Similarly, India should be making best use of its bauxite and coal resources."

Should Indian aluminium producers also look beyond the country's shores and bid for bauxite and coal resources abroad? Das says, "for makers of metals, aluminium or otherwise, raw materials security is of prime importance. Our companies should be encouraged to acquire bauxite assets abroad. But here I shall put a caveat. We shall prospect for acquisition opportunities in countries with which India has a good relationship and where governments are favourably disposed to foreign investment. Long-term security of assets is always an important determinant of any acquisition. Low-cost energy is the reason why NALCO is in search of a foreign location for building a smelter." While venturing abroad, investment risk could be shared if more than one party become partners in a joint venture. Boddington Bauxite Mine in Western Australia and Mineracao Rio do Norte in Brazil are two leading examples of joint ownership of bauxite assets. BHP Billiton owns 86% of Boddington and 14.8% of Mineracao.

Uncertainties surrounding Indonesian bauxite exports will remain till the Constitutional Court gives its verdict. Falling in line with requirements of value addition, five greenfield alumina refineries were launched in Indonesia in recent times. But the work on all these projects has slowed down as the promoters think it will be wise to wait for the outcome of legal challenge of export ban order. In case exports resume, the rationale for investments in alumina plants will become weak. Well Harvest Winning Alumina, a partnership between the local Harita group and China's Hongqiao, was originally scheduled to start operation of its refinery at West Kalimantan in mid-2015. This has now been pushed back to early 2016. But there could be further postponements in commissioning the refinery. The 2mt Bintan Alumina refinery is unlikely to go on stream in early 2017 as thought earlier. The state-owned PT Aneka Tambang is the only refinery working, which started production in April.

In the meantime, Guinea's parliament has approved amendments to a deal with Emi Global Aluminium, formed by integrating businesses of Dubai Aluminium and Emirates Aluminium, clearing the path for start of work on a bauxite mine opening in 2017 and construction of a 2mt refinery in 2018. EGA is to become the world's fifth-largest aluminium producer this year as the Guinean project will secure feedstock for its smelters in UAE. The developed world having left behind the scars of 2008–09 recession and emerging economies focusing on urbanization and infrastructure development, the global aluminium demand will continue to grow at 5% or more. The world aluminium production is forecast to grow 50% to 75mt by 2025. Supporting that level of aluminium production will call for massive investments in opening new bauxite mines and expanding the ones in operation and building of many large greenfield alumina refineries.

Brazil's domestic demand for aluminium grows, while exports plummet

Closures of smelters by Alcoa, shock Brazil's aluminium industry, although bauxite and alumina continue to perform strongly, *writes Patrick Knight.*

The news that Alcoa, Brazil's largest producer of primary aluminium, has closed its 100,000-tonne-a-year-capacity smelter in Minas Gerais state, and slashed production by almost 150,000 tonnes at the 460,000-tonne-capacity Alumar smelter that Alcoa shares with BHP-Billiton in Maranhao state, has shaken Brazil's aluminium industry to the core.

Alcoa has cut its output of primary aluminium worldwide, in an attempt to reduce the massive supply surplus which is keeping aluminium prices to below what it costs to produce at many mills. Because Brazil is now one of the world's highest-cost producers of primary aluminium, a high proportion of Alcoa's 21% cuts in its global capacity, have been concentrated there.

Even before the latest cuts, Brazil produced almost 20% less aluminium last year than a decade ago, following earlier cuts by Alcoa and two others, Novelis and Votorantim.

There is now about 400,000 tonnes of unused smelting capacity around the country.

The cuts have come at a time when demand for aluminium in Brazil is growing by more than 5% a year. The amount of primary aluminium consumed there increased from 750,000 tonnes in 2003, to 1.5mt (million tonnes) last year. If demand continues to grow at the present rate, 3mt of primary aluminium will be needed in Brazil by the early 2020s.

With only 1.3mt to be produced this year and no new mills planned, even if the mothballed facilities re-open, most of the extra needed in future will have to be imported.

Because the industry pays well above the average price for the electricity it uses, no new smelter has been built in Brazil since 1985 and nobody plans to build one for the time being.

According to Adjamar Azevedo, a past president of the Association of Brazilian Aluminium Industries, Abal, whether the mothballed smelters are started up again depends on action by the government. It will be a political, not a technical decision, he says.

Azevedo says that for the time being, the industry in Brazil is "just trying to survive" and it is "at a cross roads" regarding its future.

Another reason so much smelting capacity has been halted in Brazil, is that selling surplus electricity has become more profitable than using it to make aluminium.

Months of exceptionally dry weather has cut water levels at many of the lakes which feed the hydroelectric power stations normally responsible for 80% of the electricity generated in Brazil. This has caused the price of free market 'spot' for electricity to soar, making it more attractive for the aluminium companies, most of which generate 60–70% of the electricity they use, to sell as much as possible on the spot market.

In response to pressure from industry and anxious to attract votes in the forthcoming elections, the government promised to cut the price industry pays for its electricity by 28% last year. But in the end, prices fell by only 6%, as taxes were not reduced.

Concerned that changes in Brazil's Mining Code may mean companies have to pay much more in royalties for the ore they mine from now on, is also making the capital intensive aluminium industry nervous, at a time of a world surplus of several metals.

The cuts have come against a background of strong growth in

PRODUCTION, EXPORT & CONSUMPTION OF ALUMINIUM COMPLEX

Year	primary alumin prod '000 t	domestic cons, primary '000 t	export primary tonnes	export prods tonnes	bauxite production '000 t	bauxite export '000 t	alumina prod '000 t	alumina export '000 t
2013	1,300	1,550	480,000	745,000	36,800	7,100	13,000	9,800
2012	1,436	1,400	493,810	750,000	35,000	6,861	10,500	7,486
2011	1,440	1,440	486,927	711,391	33,700	6,887	10,200	7,276
2010	1,534	1,296	524,000	693,542	32,000	6,789	9,300	6,400
2009	1,536	1,008	649,396	447,963	25,630	3,037	8,700	5,535
2008	1,661	1,127	547,230	372,814	28,115	6,221	7,900	4,611
2007	1,655	994	581,489	437,777	25,871	5,784	7,135	3,840
2006	1,605	893	613,887	412,882	23,300	5,310	6,350	3,465

Source: Association of Brazilian Aluminium Industries, Abal, & Ministry of Trade.

all industries which use aluminium in Brazil.

Almost a third of the aluminium made in Brazil or imported is used by the motor industry, which has seen sales of cars and trucks almost double to more than three millions units in the past few years. Packaging is the second-largest market and, with consumption of consumer and other goods growing faster than the economy as a whole, demand for packaging has been growing fast as well. A construction boom has been under way in Brazil for the past few years, spurred by easier access to credit, so houses and commercial properties now take 16% of what is used.

Demand by the electricity industry, mainly for long distance transmission cables, has always behaved erratically. But with 50,000km of transmission lines needed to bring the electricity to be produced at a new generation of large power stations being built in the Amazon region to consumers in the south east, demand for cables is expected to take up to 15% of the total used for several years.

More aluminium will also be needed by the oil industry, for equipment needed at the fast growing offshore fields and for a new generation of light and fast supply boats needed to service fields up to 300km from the shore.

More aluminium will be needed to make new alloys used on platforms and underwater equipment on the sea bed and in wells.

Even before the latest round of cuts, Brazil had slipped from being the world's sixth largest producer of primary aluminium to being the eighth.

If prospects are gloomy for the production of primary aluminium, they continue to be bright for both bauxite and alumina.

Brazil has reserves of an estimated 7.5 billion tonnes of bauxite, the world's second largest. About 35mt of bauxite is now mined each year, with about 7mt of that exported, most from ports adjacent to mines near large rivers in the Amazon region.

If Alcoa has cut its production of aluminium, it continues to expand its new mine located at Juruti on the main Amazon river, where 4.45mt is now produced a year.

Some is destined for Alcoa's own alumina plants, which now make 2.1mt a year, the rest is exported directly from a port at the new mine.

Norsk Hydro has now assumed almost total control of the Barcarena alumina mill it bought from Vale a few years ago, after that company decided to exit the aluminium industry and concentrate on its iron ore assets. Norsk Hydro is also increasing production of bauxite at its Paragominas mines, the bauxite taken to Norsk's alumina mills or for export along slurry pipelines.

As well as being the world's number two in bauxite, Brazil is also the world's third-largest producer of alumina, of which about 13mt is now made. Close to 10mt of alumina is now exported each year, again most leaves from ports in the Amazon region.

Even if Brazil continues to slip down the list of aluminium manufacturers, its importance to the industry as a leading source of both bauxite and alumina continues to be guaranteed.

Despite fast growth in demand in all sectors, each Brazilian now consumes an average of only 7.5kg of aluminium each year. Although this is twice the amount consumed *per capita* a decade ago, it is still only a third of what the average consumer in developed countries uses.

The average car made in Brazil now contains only 50kg of aluminium, a third of the amount used in vehicles made in the United States and Europe. With pressure growing to make cars more fuel efficient, much more aluminium will be needed by this industry from now on.

Some of the companies now building new factories in Brazil, such as Land Rover and Jaguar, use aluminium for bodywork, as does Mercedes for some models.

Brazil is a world leader in the amount of aluminium recovered and re-used by the can industry, and 98% of the 270,000 tonnes of thin sheet used each year for this purpose is recovered. Used cans are re-cycled and on sale again just a few weeks after old cans have been collected by an army of collectors, a process which saves an enormous amount of energy.

About half a million tonnes of aluminium of all types is recycled in Brazil, 35% of the total used each year.

Despite the current difficulties aluminium smelters are facing in Brazil at the moment, they are unlikely to give up on the country, as much of the aluminium smelted around the world is produced in countries whose stability is not guaranteed. DCi

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Star Bulk and Oceanbulk to merge

In mid-June, Star Bulk Carriers Corp. SBLK +11.85% said that it will merge with Oceanbulk Shipping, owned by Oaktree Capital Management L.P. and the family of Star Bulk's non-executive chairman Petros Pappas, creating the largest US-listed dry bulk company.

Starbulk will issue 54.1 million shares of stock, currently valued at about $653 million, to Oaktree and the Pappas family, and in turn Oceanbulk Shipping LLC and Oceanbulk Carriers LLC will become indirect wholly-owned units of Star Bulk. Oaktree will own about 61% of Star Bulk's shares upon the closing of the deal. The Pappas family will hold 12.5% of the company's stock.

Petros Pappas will become the chief executive of Starbulk and Spyros Capralos, current president and chief executive of Star Bulk, will become nonexecutive chairman as part of the deal. The merger, which is expected to add to Starbulk's earnings, is seen closing within the next 30 days.

Star Bulk will also agree to certain voting restrictions, standstill obligations and ownership limitations as part of the deal, as well as certain rights for Oaktree Investors to make board nominations and to appoint officers of the company.

Star Bulk will acquire an operating fleet of 15 dry bulk carrier vessels, including newly built vessels. The combined company will be the largest US listed dry bulk company with a fully delivered fleet of 69 vessels, according to Star Bulk. The company said it plans to pursue additional acquisitions that will add to earnings.

SINWA Group: first non-UK stockist and agent for GUARDIAN

Following on from the recent announcement of its global expansion plans, Guardian Maritime Ltd, producers of GUARDIAN™ anti-piracy barriers, wasted no time in signing a deal with SINWA Group, one of Asia Pacific's leading marine supply and logistics companies, for it to become its first dual stockist and agent outside of the UK.

With owners seeking a more crew-friendly and environmentally responsible option in the fight against piracy, GUARDIAN, a proven alternative to razor wire, is a welcome addition to SINWA's anti-piracy product range. SINWA will not only be able to supply and fit ship owners and operators with the GUARDIAN system, it will also hold stock in Singapore to enable faster response times to both ship fitments and the supply of replacement units by specialist teams of GUARDIAN installers.

Peter Schellenberger, Group Sales & Marketing Director, commenting on why SINWA chose GUARDIAN, said "We have been selling huge quantities of razor wire. However, through talking to the technical and safety people, we heard about a number of problems arising from its use — one of which is the safety of the seafarers as the use of razor wire may cause significant injuries. Some companies using razor wire do not buy the proper equipment, for example not buying the right gloves, which endangers seafarers and leads to accidents on-board vessels."

Schellenberger continued, "The other issue raised by some of our major clients is the impact on the environment. Nobody talks about the issue that arises when vessels come into Singapore Port — they are not allowed to have razor wire installed. Only a very few take it down and re-install or dispose responsibly, the majority simply cut it down and throw it overboard. Multiply that by hundreds of vessels every year and you have tonnes of rusting metal in the sea. We feel that GUARDIAN offers a complete solution to both issues as well as being a highly effective piracy solution."

GUARDIAN works by covering the ship's safety rails with a specially designed barrier. Once installed, GUARDIAN provides a robust and simple way of making access to the ship or rig as difficult as possible. The system is currently protecting some of the world's biggest fleets and rigs, including CMA-CGM, Maersk and BW Tankers.

David Stevens, Director said; "We are delighted to be working with SINWA, who serve more than 100 ports across the Far East. Working together will allow us to service and protect clients from piracy that are transiting HRAs even more quickly and efficiently, working out of Singapore. We are only too aware of the unpopularity of razor wire, and GUARDIAN is completely safe for crew handling and is very environmentally friendly — at the end of its long life it can even be recycled into every day products, making the greenest piracy solution ever!"

Pacific Basin

definitely quite Handy

Michael King

In the Handysize sector, one bulk shipping company is plotting its own distinct course.

Turn the clock back a decade. Bulk carriers were getting bigger and demand from China where a string of hulking new ports were under construction was starting to change the dry bulk trades in a way that seemed certain to consign Handysize vessels to the history books — obsolete except in the back alleys of Asia's domestic trades, where modern vessels and quality management are not strictly required.

Fast forward to 2014 and bulk carriers have indeed hugely increased in size on average, mainly driven by China's immense appetite for imported raw materials. But despite the rush to supersize, Handysize vessels remain a key part of the bulk carrier fleet, performing a key role in the minor bulk trades and offering niche services to a wide range of global industries.

Over the last decade, as many of its peers were concluding that bigger was always better, one operator has stood apart. Rather than selling or scrapping its fleet of Handysize vessels, Hong Kong-listed Pacific Basin instead has instead been expanding its fleet of smaller bulkers, primarily in the Handysize class but increasingly also in the Handymax sector.

The consistent view taken at Pacific Basin has been that the Handysize sector represents good value due to the high average age of the fleet — in part linked to the reluctance of yards outside Japan to build vessels below 40,000dwt — and the ongoing need to offer bespoke cargo services to minor bulk shippers globally, and serve ports with limited infrastructure. Much the same strategy remains in place today. The ageing demographics of the Handysize fleet are still viewed as a positive, and expansion while asset prices are at historic lows remains on the cards.

Earlier this year, Pacific Basin secured financing for 12 Handysize and six Handymax vessels due for delivery from Japanese yards between mid-2015 and mid-2017. Orders for seven newbuildings at a cost of $170m were placed earlier this year — again with yards in Japan — and a handful of secondhand vessels have also been purchased taking the combined Handysize active and newbuilding fleet to over 183 vessels.

"We are the world's largest Handysize owner and operator with over 160 Handysize vessels currently on the water," said Mats H. Berglund, chief executive officer.

The company also has a sizeable share of the Handymax market, with over 70 vessels currently under operation and a further ten on order. "We are in the process of building this fleet up by buying more vessels," said Berglund.

"In total we have brought in 50 ships in the last 18 months — 32 secondhand ships and 18 newbuildings all in the Handysize and Handymax sectors — and we are still in buying mode.

"We do not try to diversify our fleet too much, we focus on our core segments rather than spreading ourselves too thinly. We don't charter our ships out, we win cargo contracts, and to win them you need fleet scale and uniform ships that can be substituted for each other.

"A focused fleet is also cheaper in terms of administrative costs such as shoreside staff — if you cover more segments you need more people so your costs are higher than if you focus on core activities."

"By being focussed and with good cargo contracts we are able to achieve higher utilization rates than the average for our fleet. And as we control cargo in one direction, this means we can be more aggressive on the backhaul."

He points out to the Handysize sector's demographics as another major positive. "Scrapping is higher in the Handysize than other segments due to its age profile," said Berglund. "It's logical. This meant that, while the Cape fleet tripled in the last ten years, the Handysize fleet only grew about 20%.

"It's a more normal age profile for Handysizes so we are happy with the supply side."

After posting a $1.5m profit on revenues of $1.7bn in 2013 despite the weak market, the company claimed to have outperformed the Handysize market by some 22%.

Berglund told *DCI* that so far this year the demand side had been relatively positive for the smaller classes of bulkers, although the ban on mineral exports from Indonesia had hurt the Handymax sector and reduced overall demand for bulk carriers as China instead pulled down stocks of bauxite and nickel ore.

"We did numerous repositioning voyages in the first quarter, primarily moving ships from the Pacific westwards," he said. "The overall market is still weak but we anticipate a stronger second half of the year.

"We believe minor bulks will grow faster than major bulks. Minor bulks tend to peak later in economic cycles and they are not only infrastructure driven unlike steel and iron ore. We carry what people eat and other cargoes such as copper and nickel ore that go into finished products. A lot is destined for China and, with urbanization, demand for this type of cargo will continue to grow."

Mats H. Berglund, chief executive officer of Pacific Basin.

He said volumes of grain into Asia were continuing to rise as the middle class expanded and dietary requirements evolved. "It's not just from Australia, it's also from the Americas and it will grow in the long term I think."

Geographical diversity of demand as well as the wide range of cargoes, and therefore customers, is another factor that tends to limit the volatility of the Handy markets, at least when compared to highly volatile Capesize and panama sectors. "There are more types of industrial business for Handies, so there is less volatility due to the number of different cargo flows," he explained. "It's not like iron ore where you are at the whim of Chinese demand and may only have three customers. We have a lot of customers and North America is our second-biggest market after China. This is why we have a wide network of offices and a lot of experience so we know how to carry the different cargoes.

"Many people shy away from Handysizes but we like this work. It has taken a long time to build up and we can send ships everywhere."

He believes Pacific Basin's strategy bodes well for long-term growth and improved profitability. "We believe in a gradually stronger supply-demand balance," he said. "Supply growth of 5% when demand is pretty good should see things improve. In fact, there has never been anything wrong with demand, it has been supply weakness. But this is improving and I believe it will continue to improve for the next two to three years. I think this will gradually drive the market up, but it will take some time to take out the surplus.

"You need to think long term in this business, and this is why we have purchased a lot of ships. We've been positioning for cyclical, gradual recovery. When that comes is difficult to say. But the ships are bought for 20 years not 16 months.

"We have bought quality ships at good prices, so we believe we are well placed in the long-term." DCi

Treading lightly on the environment

transporting dry bulk cargo by barge and rail

The Donna Rushing.

AEP River Operations: safety and respect for the environment are paramount

AEP River Operations, headquartered in St. Louis, Missouri, USA, is a barge company offering services in the transportation of bulk commodities throughout the inland river system. This includes the movement of grain, project cargo, coal, steel, ores, liquids and other bulk products. In nearly 40 years of operation, AEP River Operations has earned a reputation for excellence. Its services include:

- barge transportation and 24-hour on-call dispatch;
- shipyard services;
- barge cleaning and repair;
- assistance in identifying the best combination of stevedores and terminals to meet the cost and quality objectives of the customer; and
- project cargo logistics co-ordination.

Green approach

AEP River Operations has responded to the growing emphasis in the marketplace on 'green issues' and reducing the carbon footprint of cargo transportation. The company is improving the efficiency of its water vessels with new technology to reduce its environmental impact and operating costs.

AEP captured the industry's attention with the transformation of the *Donna Rushing* by adding/enhancing systems that have the least environmental impact of any towboat on the river. This vessel utilizes many first-in-kind technologies used in the river industry. A team effort integrated the suggestions of both AEP employees and outside agencies to achieve the final result. The boat includes many other environmentally friendly features and has influenced the choices that the company makes with all future building projects.

AEP is also in the process of installing a three-stage water purification system on all of its vessels that will put an end to the need for bottled water on the boats. When installed throughout the fleet, this effort will eliminate disposal of a minimum of more than 250,000 plastic bottles per year.

AEP is installing a new lube oil filtering system on its vessels that eliminates the need for literally 'many thousands' of paper filters and the disposal of oily waste from its boats.

In keeping with its green efforts, in May of this year, AEP River Operations became a SmartWay Transport Partner. The US Environmental Protection Agency launched the SmartWay brand in 2004. The SmartWay brand identifies products and services that reduce transportation-related emissions. AEP looks forward to continuing its work towards cost-effective and environmentally efficient transportation.

As of 27 June, AEP River Operations has not had an environmental spill or incident in 597 days. An achievement like this can only happen when everyone is committed to following policies and procedures. AEP River Operations is committed to its teammates and to the environment.

Operations

AEP River Operations transports a range of commodities, including steel, grain and grain products, sugar, fertilizer, cement, lime, limestone, project cargo, alumina and aluminium, gypsum, coal, petcoke, ores, steel raw materials, scrap metals, sand, gravel, liquids and other bulk products.

The company has 2,770 barges and more than 70 boats. It operates in a market where it has fewer than ten fully integrated competitors.

In order to diversify revenue stream, the company launched the first of 20 tank barges at Jeffboat on 30 January. The new barges will all be 10,000-barrel, externally framed units designed for clean chemicals.

The barges are 35 by 200 by 12.5 feet, heavily built weighing approximately 424 tonnes. The barges have three cargo tanks with a combined capacity of 11,000 barrels, five wing tanks, a rake void and a stern void. The cargo tanks have 'six-pound tops', and can withstand pressures of 6.4 pounds-per-square-inch before venting.

Company background

AEP River Operations is a wholly-owned subsidiary of American Electric Power (AEP). AEP is one of the largest electric utilities in the United States. AEP River Operations is a fully integrated barge line delivering over 65 million tonnes of dry cargo each year. AEP's fleet of boats (70) and barges (2,770) operate along the Gulf Coast to as far north as Minneapolis, Chicago, and Pittsburgh and to as far south and west as Brownsville and Catoosa and points in between.

The company's headquarters is in St. Louis, Missouri with regional operations in Pittsburgh, New Orleans, and Mobile. Its boat and barge operations are in Lakin, WV and Paducah, KY with Gulf operations including a full-service shipyard, barge cleaning and repair, fleeting and shifting, and midstream transfers.

Recent developments

In June 2011, in accordance with its target of zero harm to the environment, AEP River Operations began purchasing B-5 biodiesel (5% ethanol, 95% diesel) for its fleet of towing vessels. Biodiesel provides a life-cycle emissions reduction of 78%

Rail Freight Alliance launched late 2013

At the end of October last year, the UK's five major Rail Freight Operating Companies and Network Rail announced the formation of The Rail Freight Alliance.

The formation was endorsed by the Rail Delivery Group after a framework and set of strategy objectives were agreed by the Rail Delivery Group's Freight Group; with a view to delivering a sustainable and flourishing rail freight sector in the UK:

- delivering whole-industry cost savings,
- developing 'smarter use' of the network, and
- a sustainable charging framework for freight.

Peter Maybury, Chair of the RDG Freight Group said: "The creation of The Rail Freight Alliance is an important step forward for the rail freight sector. The Alliance will give the rail freight sector a stronger voice in the rail industry and give an opportunity to resolve some significant issues that remain for the sector."

Paul McMahon, Freight Director, Network Rail said: "I'm delighted that The Rail Freight Alliance has been agreed . Greater collaboration between the operators and Network Rail will enable us all to better address the challenges and the opportunities that the sector faces in the next five years and beyond."

compared to petroleum diesel. When this effort began, only two fuel vendors had B-5 available for purchase. After using B-5 fuel on some of its vessels, AEP witnessed very favourable results in way of emission reductions. Consequently, the company approached other fuel vendors to persuade them to provide B-5 at its mid-stream fuelling facilities. AEP River Operations requests that its fuel vendors provide B-5 fuel for purchase whenever feasible.

Another target adopted by AEP River Operations was to install the Overboard Recovery Alarm System (ORCA) on all of its vessels by 2014. The company has announced that this system has been successfully installed fleet-wide. The ORCA system signals the pilot house should a crew member, or anyone wearing an ORCA transmitter, fall overboard. According to the United States Coast Guard, the largest number of fatalities on

workboats in the United States are from overboard accidents. Most of these occur when it is dark and unwitnessed. Two factors contributed more than any other in the successful rescue of a person who has fallen overboard; a personal flotation device and a way to be found.

AEP River Operations is an industry leader when it comes to safety. Its employee injury rate is among the lowest in the inland barge and towing industry as measured by the American Waterways Operators. The addition of ORCA alarms will help it keep AEP mariners safe.

AEP River Operations has been recognized as having 38 vessels which operated for two full years or more without a crew member losing a full turn at watch because of an occupational injury. The Devlin Award Certificates are awarded to all self-propelled merchant vessels that work accident-free for two or more years. The awards were presented at the Annual Ship Safety Achievement Awards Luncheon in New Orleans on 29 May.

Ironing out the twists and turns of barge transport with JP Knight

Transport of bulk cargoes by river is perhaps the most serene yet relentless way humankind has so far devised to move those less-conveniently located products and ores that underpin our economies, *writes Richard Knight.* Where the zenith of transport is speed, by river it is accumulation.

Such dichotomies are often found in river transport.

In JP Knight's long experience on the Berbice and Suriname rivers in South America, the simple act of going from A to B, from loading point to discharge point is far from a straight line. The transport route on the Berbice in Guyana has in the order of 60 bends over a distance of 125 miles, which equates to a turn every 20 minutes.

In Suriname, the four-river transport route is 133 miles long but has an incredible 108 bends that would, if averaged, come at you at the rate of one every 11 minutes (as the crow flies however, in both routes the straight line distance is just 54 and 69 miles respectively). This of course completely underplays the complexity of the bends, their entry and exit points and how they relate to each other, quite apart from the skill required to commit to one let alone a sequence of bends…

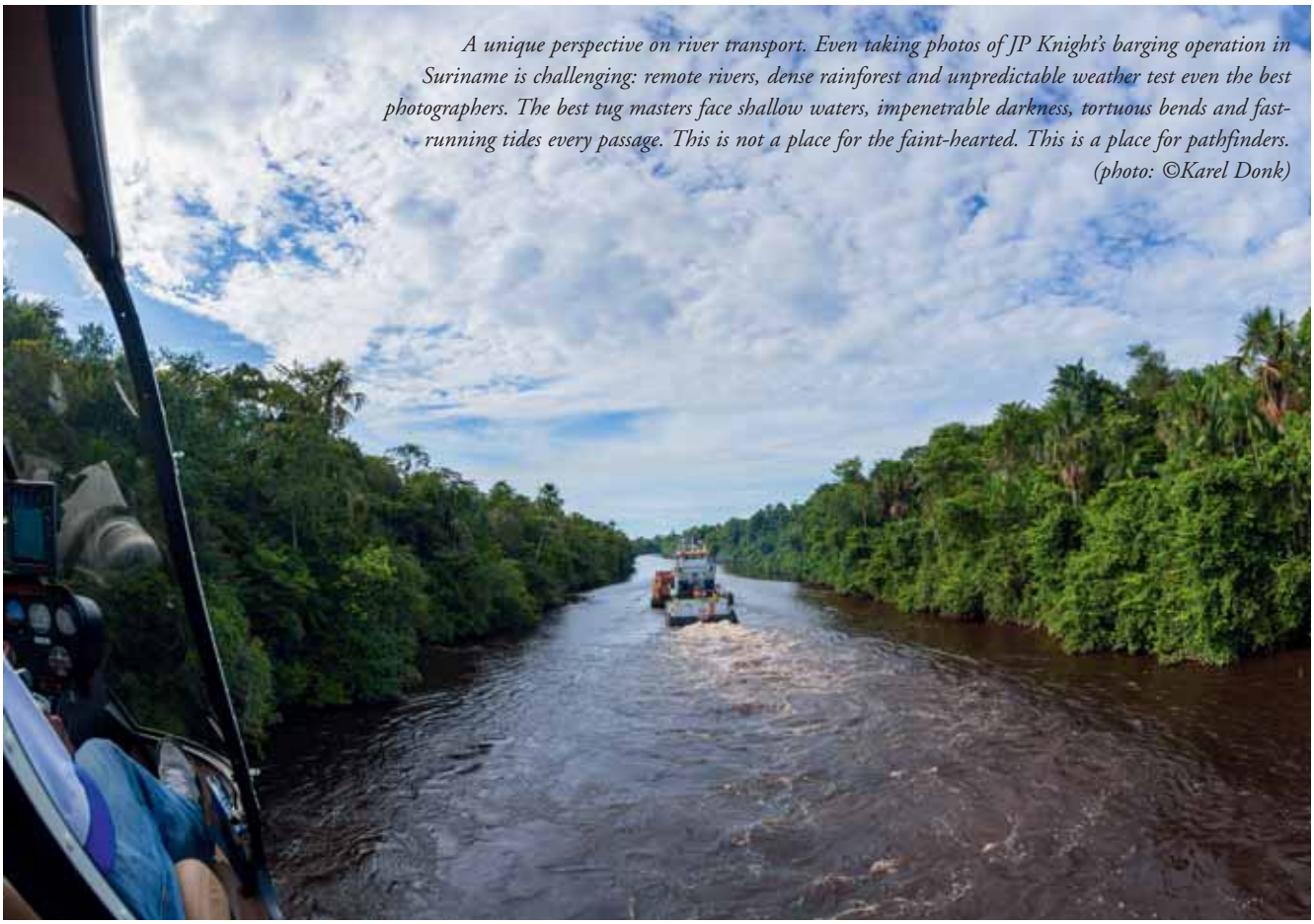
The intensity of barge handling today is far removed from Mark Twain's description of the Mississippi in the *Adventures of Huckleberry Finn*, written in 1885, seven years before my great-great uncle founded our company: "It was kind of solemn, drifting down the big, still river, laying on our backs looking up at the stars… we had mighty good weather as a general thing, and nothing ever happened to us at all — that night, nor the next, nor the next."

In amongst that intensity can come the unforeseen. Captain John Hanson and his crew on board *Kutari* had just begun a night passage on the Suriname River, departing on the last of the flood with empty barges bound for the loading facility, when over the tug's VHF came a call for urgent assistance. A mooring boat had overturned whilst attending a ship in port and the three crew were in the water. Amidst the sound of the general alarm, the tug's fly boat was launched and *Kutari's* search lights raked the river banks upstream, all the while the tug and its barges stemming the tide. In a co-ordinated search and rescue operation with the police and the port authority, two men were safely recovered, but regrettably one remained missing and was not found until the next day.

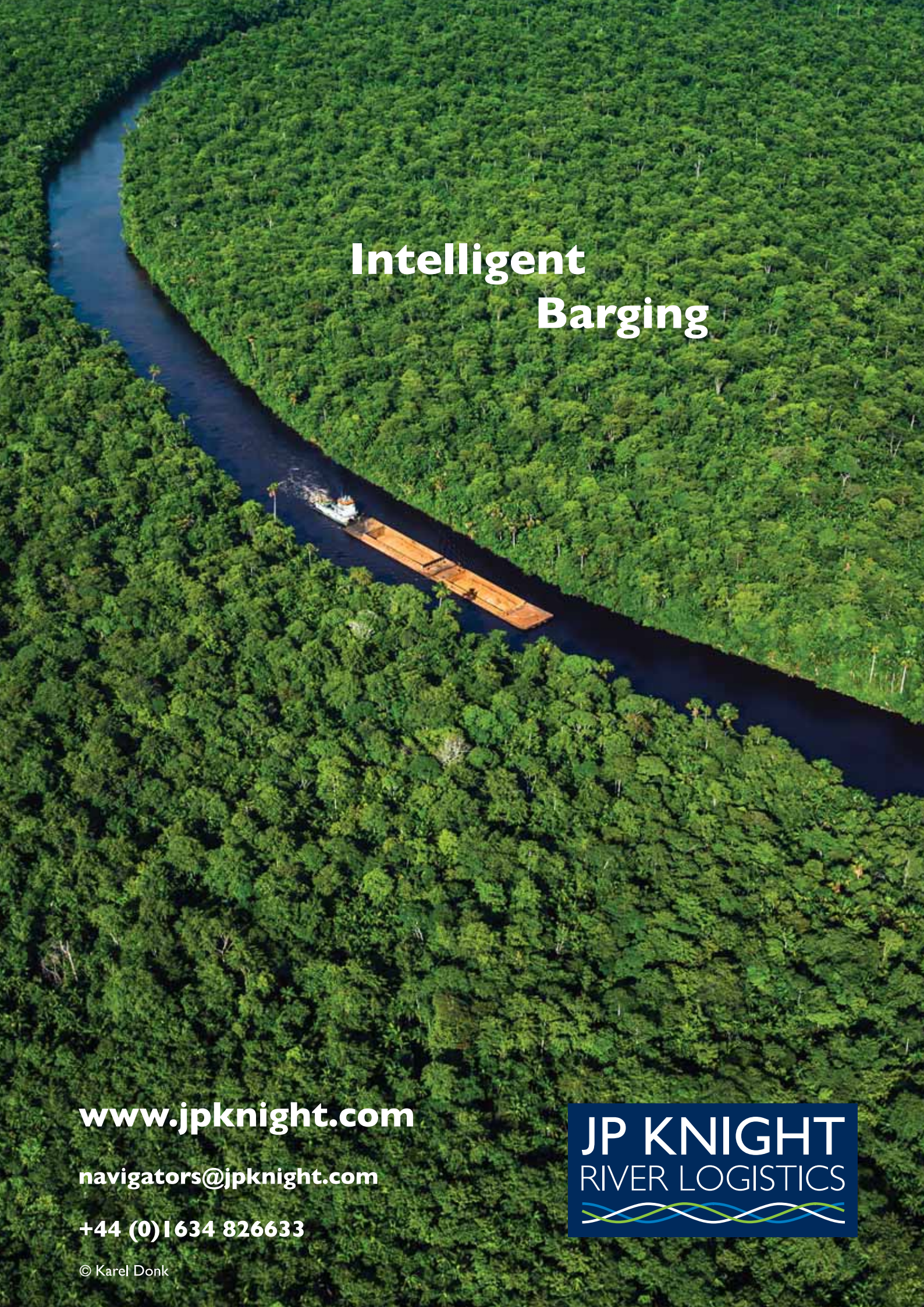
Such an event remains mercifully rare, but constant drills and training have a true and indispensable value. We boast of the accumulation of tonnage, the distances travelled (2.7 million nautical miles, for example), of horse power and numbers of barges, but the truth is we should boast of our officers and crews and recognize the extraordinary professionalism that can go unseen.

Picturing remote river operations can be a challenge in itself. The gifted and (as it transpired) cool-headed photographer Karel Donk, took to a helicopter to capture one of our convoys as it pushed barges loaded with bauxite through the sinuous rivers of Suriname.

One of his remarkable pictures is featured here, which shows the lengths a professional will go to get 'that' shot: the helicopter losing lift as it settled almost on the water. A description of the shoot can be found on our blog at JP Knight's website. What one cannot help but notice is the solemnity that Mark Twain described, perhaps even a majesty, as a convoy impudently descends the slight margin cut through the lowland rainforest. Not leaving a trace of your passing whilst amassing vast tonnages is surely the environmentally intelligent proposition?



A unique perspective on river transport. Even taking photos of JP Knight's barging operation in Suriname is challenging: remote rivers, dense rainforest and unpredictable weather test even the best photographers. The best tug masters face shallow waters, impenetrable darkness, tortuous bends and fast-running tides every passage. This is not a place for the faint-hearted. This is a place for pathfinders. (photo: ©Karel Donk)



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JP KNIGHT
RIVER LOGISTICS

Transnet Freight Rail: serving the South African freight market

Transnet Freight Rail (TFR) is the largest operating division of Transnet Limited, a state-owned company (SOC) with the South African government as its sole shareholder. It is a world-class heavy haul freight rail company that specializes in the transportation of freight. Transnet Freight Rail has approximately 28,000 employees, who are spread throughout the country.

TFR owns and maintains a network of 20,500 route kilometres (22,000 track kilometres) connected to ports and the rail networks of neighbouring countries. The company services a wide range of industries including, but not limited to; mining, coal, iron ore, manganese, steel, chrome, cement, granite manufacturing, agriculture, automotive, petroleum and chemicals.

Transnet Freight Rail:

- transports 14% of the nation's freight tonnage annually or 35% of tonne kilometres;
- operates 800+ trains per day;
- serves 450 key accounts;
- conveys 98 commodity groups over more than 4,000 origin–destination combinations;
- transports 3.5mt (million tonnes) to 4mt per week; and
- in 2012, TFR moved 201mt, surpassing the 200mt mark for the first time.

TFR maintains an extensive rail network across South Africa that connects with other rail networks in the sub-Saharan region, with its rail infrastructure representing about 80% of Africa's total. The company is proud of its reputations for technological leadership beyond Africa as well as within Africa, where it is active in some 17 countries.

Transnet Freight Rail changed its operations structure from the three regions to at least six smaller units. This has enabled the organization to have a much more detailed focus on operations. The six business units are:

1. Agriculture and Bulk Liquids
2. Coal business
3. Container and automotive
4. Iron ore and manganese
5. Mineral mining and chrome business; and
6. Steel and cement.

These business units are accountable for specific customer groupings and control allocated geographical areas for operational purposes. Allocations of these areas are based on activity levels related to the customer groupings the units are accountable for. Operations are centrally controlled and the central operational structures have been re-aligned to optimize operations across the business units.

Transnet Freight Rail is proudly placed to dramatically alter the South African rail industry. This enables it to play a positive and active role in the transformation of our society. It does so against the backdrop of sound business principles, a regulatory framework and the challenges of meeting the expectations of our customers.

VOLUMES

	2012/13	2018/19
Export coal (mtpa)	7.18% to 75.0	39.3% to 97.5
Export iron ore (mtpa)	12.3% to 59.5	55.7% to 82.5
General freight (mtpa)	9.9% to 90.3	113.5% to 170.2

Market Demand Strategy

The Transnet seven-year Market Demand Strategy (MDS), introduced by President Jacob Zuma in his State of the Nation Address on 9 February 2012 is the centrepiece of government's growth strategy through investment in infrastructure. It is also a key component of enabling the aspirations of the New Growth Path (NGP). The MDS will catapult Transnet Freight Rail (TFR), towards becoming amongst the top five railway companies in the world by 2020. Rail volumes will increase from approximately 200mt in the 2012/2013 financial year to 350mt in 2020. By then, TFR will have increased its market share of container traffic to 92% from the current 79%. The increase will have a major impact on reducing the cost of doing business. Studies conducted by Transnet show that rail in South Africa, on average, is 75% cheaper than road transport which is rails biggest competitor. In addition, the large scale shift of rail friendly cargo off the roads and onto rail will address costs and congestion on South Africa's roads as well as reduce carbon emissions. This strategy aims to deliver a lasting economic, social and environmental value to society.

Capital investment

- implement a 7-year capital investment plan of R201.0 billion;
- reprioritized investment to improve allocation to specific growth market segments;
- investment in strategic infrastructure, standardizing the network and rolling stock;
- export coal 16%;
- export iron ore 9%; and
- general freight 75% countrywide spend.

Inspirational leadership and employee development

- job creation in line with volume growth and capital expansion;
- training and development of specific skills;
- re orientate relationship with recognized trade unions; and
- employee reward, incentive & Gain Share programmes.

Growing volumes

- shift rail-friendly traffic from road to rail;
- grow market share from ~24% to ~36% in 2018/19;
- transport 225mt of freight in 2012/13 and 350mt by 2018/19;
- create capacity for emerging miners; and
- increase over-border rail volumes.

Productivity and operational efficiencies

- rollout of Lean and Six Sigma methodology for continuous improvement;

FHH first freight operator to use Doncaster North Chord

Freightliner Heavy Haul Limited (FHH) became the first rail freight operator to utilize the new Doncaster North Chord for commercial service when it opened for use on Sunday 1 June.

Freightliner's Immingham to Ferrybridge service passed over the completed Network Rail project at around 1pm.

Martin Wilks, Director of Coal Services for Freightliner Heavy Haul said: "We welcome the opening of the Doncaster North Chord as an important new addition to Network Rail's infrastructure. This is an important project which gives freight trains a clear run towards the power stations, without incurring the performance risk of crossing the busy East Coast Main Line, and will improve the service we can offer to our customers. The movement of coal to generate electricity is vital in keeping the UK's lights switched on. Over 35% of UK-consumed electricity is generated by coal moved by rail."

Freightliner Group is a leading rail freight operator based in the UK, with operations throughout Europe and Australia. Freightliner manages a modern fleet of state-of-the-art rolling stock and road vehicles to meet customer demands.

Providing intermodal container and bulk haulage services, Freightliner runs over 1,800 trains every week in the UK alone, as well as offering maintenance solutions for rolling stock and infrastructure.

Staying ahead of the competition, Freightliner continues to invest in its employees, terminals, depots and operating systems.

Freightliner prides itself on providing quality services, ensuring customers get the service they need with the reliability they can depend on.

- provide a scheduled railway operations philosophy: simplified operations, structure for accountability, plan for efficiency and introduction of technologies;
- implementation of resource planning and scheduling tool to selected business units;
- automation of yard points control systems; and
- turnaround programme and transformation partnering with American Latina Logistics (ALL)

Driving accountability

- business unit launch and implementation;
- focus of business units on operations de-bottlenecking and improvement for volume growth;
- corporate role definition and clarity — centralization versus decentralization; and
- processes & systems and MIS supporting business unit organization design.

Safety

- reduction in number of incidents;
- reduction in DIFR;
- improved NOSA ratings in yards;
- continued focus on safety — people management and training with adherence to training working rules and standards operation procedures;
- deployment of an integrated condition monitoring system;
- rolling stock management — monitoring of braking systems; obc; data loggers; roller bearings; front mounted camera;
- level crossing policing; and
- increased security to prevent cable theft.

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Rolling stock

Since the 2012/2013 fiscal year till year to date, TFR has received a total of 153 new locomotives that are operating on the organization's network. These locos include 105 class 43D locos, 16 Class 19E's as well as 32 class 15E locomotives.

All these locomotives have various interesting aspects like the fact that the class 43 D's are more reliable than their predecessors and are equipped with all the latest technology. The 15 and 19 E locomotives are also more technologically advanced, with their AC/DC capabilities, their regeneration technology and ergonomics, which are a plus for the drivers. The technology embedded within these locos allows TFR to be more reliable and more efficient in the service we provide.

New Locomotive acquisitions

On 22 October 2013, Transnet announced that a consortium led by Chinese manufacturer, CSR Zhuzhou Electric Locomotive (CSR), was the successful bidder for the supply of 95 electric locomotives to be used in Transnet Freight Rail's General Freight Business. The purchase will boost operational performance, reliability and overall energy efficiency of the rail service.

Following the conclusion of the procurement of the 95 locomotives, on 17 March 2014, Transnet announced that it had awarded a R50 billion contract for the building of 1,064 locomotives, to four global original equipment manufacturers (OEMs). The majority of these locomotives will also be used for TFR's general freight business. This is a drive to modernize Transnet's fleet and improve availability, reliability as well as achieve customer satisfaction. The contract was awarded to CSR Zhouzhou Electric Locomotive and Bombardier Transportation South Africa for the supply of 599 electric locomotives, while General Electric South Africa Technologies and CNR Rolling Stock South Africa (PTY) Ltd will build and supply diesel locomotives. The multi-billion-rand acquisition is the country's single biggest infrastructure initiative by a corporate.

Transnet Freight Rail: sustainability & green initiatives

Sustainable development is increasingly playing a major role in terms of determining future strategies for business around the globe. Sustainable development is the one that considers the integration of the social, economic and environmental factors into planning, implementation, and decision-making in order to ensure that business developments fully serve the present and future generations.

Transnet Freight Rail prides itself in being one of the leading role players in freight logistics transport in South Africa, and subscribes to sustainability and green economy principles. It has put in place the Sustainability Governance Structure and is entrenching sustainability principles into its daily operations. This commitment is an integral part of its corporate strategic plan.

As it continues to capture market share, influencing strategic policies of road to rail migration to reduce overall national carbon footprint, Transnet aims to become more dominant and a reliable benchmark in Africa and beyond on matters affecting sustainability and green economy. Without compromise, it has accordingly initiated a number of green economy projects which it vigorously rolls out throughout the business. Amongst other, these are worthy of being mentioned:

- climate change strategy and carbon mitigation plan;
- SAP waste management, re-use and recycling initiatives;
- energy and water saving initiatives;
- locomotive fuel facility upgrade efficiency programme;
- road to rail migration strategy;
- scheduled railway efficiencies;
- service design reviews; and
- teleconferencing facilities/systems.

In addition to the abovementioned, Transnet has made an unwavering commitment in its seven-year business strategy to implement the following greening initiatives:

- greening of supply chain services;
- integrated management systems to achieve individual ISO certifications;
- property energy structural designs;
- fuel purification and enhancement; and
- carbon management plan and reduction of carbon footprint.

In pursuance of these green initiatives, Transnet will draw strength from the solid partnership it has established with government at all levels, community organizations, business partners, its customers and clients. In doing so, as it has previously surpassed expectations, it will continue to identify community needs within its areas of operations and implement sustainable poverty alleviation project. This mandate is well entrenched in Transnet's stakeholder engagement and corporate social investment policies. DCi

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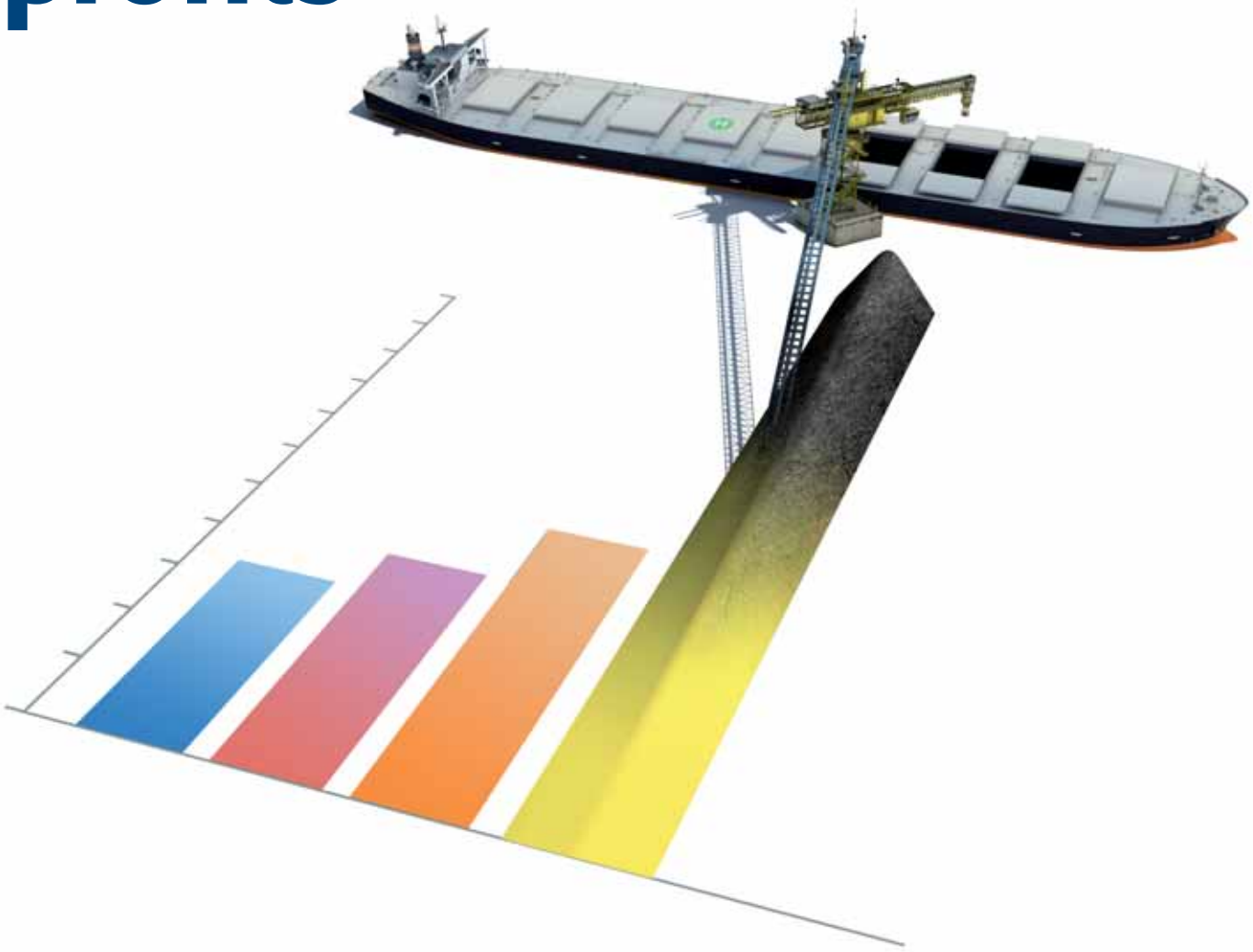

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Simplifying grain shipments in Brazil

Patrick Knight

The start up of two new terminals built by the Bunge trading company on rivers in the Amazon, heralds a new era for the export of soya and maize from Brazil, as they will cut the cost of shipping grain by up to a third.

A shipment of 65,000 tonnes of soya beans grown in the state of Mato Grosso which left from a recently completed terminal built by the Bunge trading company at the port of Vila do Conde, close to the mouth of the Amazon, has opened a new era for the shipment of Brazilian grains.

Until now, 80% of the soya and grains exported from Brazil, no matter where it was grown, has left from a handful of ports in the crowded south east of the country.

Bunge's soya, destined for Spain, travelled by truck from farms in Mato Grosso, along the still only partly paved 2,500km BR-361 highway, to Bunge's second new terminal at the riverside Port of Miritituba, 300km upstream from the Amazon port of Santarem.

The soya was loaded onto barge trains at Miritituba, each train able to carry 40,000 tonnes. The barges took the grain 1,000km down the Tapajos and Amazon rivers to the terminal at Vila do Conde, which can handle ships of up to 120,000 tonnes capacity.

Apart from Bunge, a dozen foreign and Brazilian trading companies are also building storage and loading facilities at Miritituba and at four deep water ports downstream.

Bunge expects that about 2mt (million tonnes) will leave by the Tapajos-Amazon route this year. But as new terminals start up and fleets of barges now being built come into service, up to 4mt will leave from Miritituba in 2015.

Paving the BR-163 should be complete by then, so up to 18mt of soya and maize are expected to use this route by the early 2020s, 30mt in the longer term.

Almost a third of the almost 90mt of soya beans now produced in Brazil each year, as well as about a quarter of the 75mt of maize, are grown in the state of Mato Grosso. But until now, 85% of the grain grown in the state has trundled 2,500km along poor maintained and increasingly congested roads, to Santos or Paranagua. If these ports are very congested and at peak times trucks can wait 60 hours to unload, vehicles drive a further 500–800km to Rio Grande or Sao Francisco do Sul.

It now costs about $150 to get a tonne of the grains grown in Mato Grosso to a port, twice as much as five years ago. Wages have doubled in Brazil in the past 10 years, fuel costs have increased, as have those of maintaining vehicles. The number of hours drivers can remain at the wheel has been restricted in an attempt to reduce the number of accidents, one of the world's highest.

As well as queues of trucks, ships often have to wait up to a month at ports to load, resulting in a massive bill for demurrage.

Spending on improving Brazil's infrastructure, or even maintaining what already exists, has been low on the list of government priorities for many years. But because the amount of grains produced each year has doubled from almost 100mt to close to 200mt in the past ten years, with the amount exported growing even faster, the logistics situation has become desperate.

In the past few years, only about 5mt of the 45mt of soya beans and meal exported from Brazil each year have left from ports in the north, even though close to half the total produced in the country is grown in the north or north east of the country.

Apart from the 3mt shipped from the port of Itaqui, in Maranhao state, most of it grown in the north east and taken to the port by road or rail, the rest travels by barge down the river Madeira. It is loaded into deep sea vessels either to the port of Itacoatiara, where the Brazilian Amaggi group has a terminal and crushing facilities, or on to Santarem, where Cargill has had a terminal for several years.

Once the new facilities on the Tapajos and Amazon are working properly, it should cost a third less to ship soya and grains from the ports in the north than it does via Santos and Paranagua.

A round trip from ports in the north to ports in Europe or Asia will take up to five days less than one starting at ports in the south, which means further cost savings.

Only two regions of Brazil will be able to grow significantly more soya and maize than is now possible, as all the land in the south and south east is fully occupied.

One is the centre west, with Mato Grosso in the lead, as well as Mato Grosso do Sul and Goias, the other is comprised of

four states in the north east, Piaui, Maranhao, Tocantins and Bahia, known as 'Mapitoba' for short. About 10mt of soya is now grown in this area, as well as 5mt of maize.

Until now, China has not bought maize from Brazil, although it is by far the leading destination for soya beans, with 32mt of the 43mt shipped last year going there.

The average Chinese now eats about 60kg of pork, chicken and beef each year. But according to USDA estimates, the *per capita* consumption of meat in China, will have risen to 90kg by the early 2020s.

China now buys most of the maize it imports from the United States. But with capacity to increase output there restricted, Brazil will almost certainly become a leading supplier of the grain to China in future.

Although the new route from Mirituba to four deep water ports is attracting a great deal of attention and investment at the moment, there are plans to make several of the other large rivers which traverse areas where grains are grown, navigable to barges in the next few years.

The government plans to build no fewer than 50 new hydroelectric power stations on the upper reaches of the Tapajos itself, or along its numerous tributaries.

Until now, locks have rarely been incorporated alongside the dams which contain turbines. In one case, on the Turucui, such locks were only built 30 years after the power station started up. This was because of a dispute as to whether the company building the power station, or the ministry of transport should pay for the locks.

Two new dams without locks are virtually complete just above the city of Porto Velho, now the limit of navigation on the Madeira, along which about 2mt of grains are now taken by barge to deep water ports each year. This river could carry twice as much as it does now, if some dredging were done and buoys which would allow barge trains to travel for 24 hours, rather than just during daylight, were installed.

Dredging is also planned for the river Paraguay, to allow barges to travel down to ports on the Parana river in Argentina. Up to 4mt of the grain grown in Rondonia and western Mato Grosso states could use this route.

If a new era is opening up for waterways, which is by far the lowest cost mode for carrying bulk cargoes, numerous projects which will allow much more to be taken to ports by rail, are now under way.

Plans to remove restrictions which now limit the tonnage able to use the two lines running to Santos, one operated by the Latin American Logistics, ALL company, a narrow, metre gauge line, the other a broad gauge line operated by MRS, are gradually making progress.

ALL is duplicating its tracks, which involves building several new tunnels, while the project has also run into trouble because it passes through several small Indian settlements on the way, which means authorization from the environmental authorities is needed.

Indians are a source of difficulty along several rivers in the Amazon area as well, as backed by several vociferous NGOs, they have managed to block projects.

The generally authoritarian behaviour adopted by governments in recent years have failed to persuade the Indians to give way. But the proposal that the Indians should be given a share of the profits arising from the new power stations and waterways, rather than bullying them, may prove a solution to the problem.

MRS's line to Santos, which serves Mato Grosso do Sul, Goias and Minas Gerais, passes through the centre of Sao Paulo city, where it shares tracks with commuter services. This means freight trains can now only use the line in the early hours of the morning.

A debate has raged for many years as to whether MRS should build a line skirting the city, or whether a tunnel should be built under the city centre. Whether a by-pass should run to the north or the south of the city has also been an issue. It now seems likely that tracks following the path of a new orbital road to the south of Sao Paulo, will be laid.

Delays of this kind have dogged the building of new railways, or extending existing ones in Brazil for decades.

In the mid-1980s, work started on building the daddy of them all, the 2,500km 'north–south line' which will eventually run from a point on the line which carries Vale ore from its Carajas mines to the port of Itaqui, south to Sao Paulo state. This line passes through, or close to, millions of hectares of land where grains are grown.

So far, only about 500km of this line is open to traffic, largely because the finance needed to complete it keeps drying up, as well as general inefficiency and corruption.

Until now, there has been little co-ordination between competing projects of this type.

Politicians anxious to make an impact for electoral reasons have frequently launched ambitious projects, and two new railways are planned to run up to 2,000km west from an Atlantic port to a point on the part-completed north-south line.

These two projects are already bogged down, just a few years after being started, and will take at least six more years to complete.

It has now become clear that the state bodies responsible for executing such projects, have found it impossible to complete them. This has obliged a reluctant government to resort to auctioning concessions whereby private companies will undertake to build or expand projects and receive tolls, or to receive subsidies from the government to do so.

As part of an expansion plan for railways, which envisages about 10,000km of track to be built from scratch, or upgraded in the next few years, two new lengths of track to stretch north west into the soya and maize producing areas are planned.

The association of oilseed crushers, Abiove, is also pressing for a new line which would run parallel to the BR-163 highway, terminating at Mirituba or Santarem to be built.

The government also plans to auction the concession to build and operate a new 480km stretch of line to run from the point where the North South line now starts, on the Carajas railway, north to the port of Vila do Conde.

Daniel Amaral, chief economist with Abiove, worries that a major problem in Brazil has been the absence of a system of priorities, whereby a small number of selected key projects are begun and completed. At the moment, numerous competing projects are started almost simultaneously, usually for electoral reasons. But partly because there is a chronic shortage of trained engineers and managers to build and run them, none get completed on schedule, or at all.

In the past few years, the revenues the export of steadily increasing amount of grains, as well as other bulk commodities such as minerals, have become increasingly essential to Brazil's financial well-being.

For this reason, sufficient funds for investment may be forthcoming at last and logistics will again become the priority they last were in the 1970s, when the country's present network of paved roads and a handful of railways were built. DCi

The Port of Yuzhny is the deepest in the Azov-Black Sea basin

In June 2014 the navigable draught at the Port of Yuzhny (Odessa, Ukraine) increased to 18.5m thanks to the dredging that has been carried out in the operational water area and the approach channel by Mobius GmbH since February 2013.

On 22 June 2014, the Capesize vessel *Kanaris* set sail from the Port of Yuzhny to China carrying iron-ore concentrate produced by Metinvest Holding (SCM, Ukraine). It is the first Capesize vessel to have been loaded to full capacity at the port's 18.5m berth. The second similar Capesize *Blue Cho Oyu* was loaded with iron-ore pellets and left the Port of Yuzhny on June 27.

Yuzhny is the deepest port of the Azov-Black Sea basin that offers extensive logistics advantages to shippers of iron ore and coal.

"Until June, all Capesize vessels had to be loaded to the full capacity offshore. Now that the port has become deeper, shippers and shipowners can save time and money by reducing the Capesize loading time," said Alexander Lagosha, the director of the Port of Yuzhny.

By the end of this year Ukraine is planning to deepen the water area and the approach channel of the Port of Yuzhny up to 21m. This will make it possible to fully load Capesize vessels of up to 200,000dwt at the berth. The port development plan indicates that deep-water conditions will be established for all the existing terminals handling various types of cargo e.g. grain, coal, ore, liquid cargo and LNG.

TPP beating all traffic forecasts

In 2013, Terminales Portuarias del Pacífico (TPP), which is based in the Mexican port of Lázaro Cárdenas, completed its first full year of operations, during which it handled 3.6mt (million tonnes) of iron ore, which was higher than budgeted. Indeed, such was the affluence of traffic that the terminal was reduced to operating at the limits of its capacity and has subsequently had to invest a further $7 million in acquiring a new Liebherr 600 crane, which is the largest of its type in the world.

With two port cranes now operational, TPP says it will be able to handle Capesize vessels of up to 142,000 tonnes in 4.7 days, as opposed to seven days with a single crane.

For 2014, the terminal is forecasting traffic of up to 4.5mt of iron ore, which will be exported to China from mines in Michoacán.

However, earlier this year, TPP suffered a major setback, following a delay in awarding the correct mining permits, which delayed the first shipment of iron ore to China this year until 5 March. This initial consignment consisted of 74,000 tonnes, which was loaded at a rate of 43,000 tonnes per day.

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Suape sugar terminal to go ahead

Brazil's Administrative Council for the Defence of the Economy (CADE) has given the go-ahead for Odebrecht Transport to buy a 75% stake in Agrovia do Nordeste. As part of its approval, a new dedicated sugar terminal will be built at the port of Suape, which will require investment of around $75 million.

The terminal, which will make use of existing berth 5, is expected to commence operations in 2015. It will reduce from 15 to 5 days the time needed to load stockpiled sugar as well as allowing the operational capacity of consignments to increase from 10,000 tonnes to 35,000 tonnes.

Berth 5 is 355m long and is served by a backup area of 72,500 square metres. The terminal will have an operating concession for 25 years, although could be expanded for a further 25 years beyond that. In its first year, it is expected to handle 200,000 tonnes of sugar, increasing to 738,000 tonnes by 2038. *BC*

China continues ban on Valemax vessels

China has extended its ban on the use of Valemax vessels entering its port. A new directive, which takes effect as of 1 July 2014, specifically prohibits calls from 350,000dwt vessels. At the same time, it does allow for partially loaded vessels of this capacity to use facilities. Last April, for example, one of the 400,000dwt Vale bulk carriers did use a Chinese port, albeit only partially loaded. The new directive allows vessels of up to 250,000dwt to dock and vessels up to 325,000dwt to dock if partially loaded. *BC*

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ArcelorMittal and Vale oppose new Brazilian deepwater port

In Brazil, Vale, ArcelorMittal, Gerdau and Usiminas have asked the Espirito Santo Port Company (Codesa) not to build a super port in Praia Mole, but instead move it to Ponta da Fruta. They argue that companies already located at the former site would be severely impeded should they decide to expand existing facilities. Both Vale and Arcelor already operate there. However, were the new port to be built in Ponta da Fruta, it would have a negative affect on numerous local residents and fishermen, as well as causing environmental degradation to the local beach. The cost of building the deepwater port at the alternative site would also be significantly more expensive. *BC*

Essar receives call from India's largest bulk carrier

Essar Bulk Terminal has received a call from the 175,000dwt *Kiran*, which is the largest bulk carrier in the Indian fleet and also the largest vessel to make use of this facility. It called at the terminal to offload iron ore pellets.

Essar is one of India's largest port companies, having a capacity of 104mt (million tonnes) per annum, which is being extended to 181mt over the next few years. It operates terminals at Hazira, Vadinar and Paradip. *BC*

Vizag to become Indian coal hub

Visakhapatnam port in India is developing a role as a regional hub for imported coal. Vizag General Cargo Berth, which is a joint-venture between Vedanta (74%) and Leighton Welspun (26%) has built a coal terminal at a cost of $113 million. Additionally, the harbour has been dredged up to a depth of 20m, allowing 200,000dwt vessels to access the outer harbour. This allows coal to be imported from the US, Indonesia and South Africa, among other countries.

Currently, the port reports an annual volume of the imported coal of around 10.5 million tonnes, however, new power projects close to the port will need an additional 10% increase in that volume. *BC*

New coal terminal in Sukhodol Bay

A start is to be made on building a new coal terminal in Sukhodol Bay, in Russia, in the third quarter of this year. An initial phase, capable of handling 6 million tonnes, will become operational in July 2017. Two subsequent phases will be implemented in 2019-2021. Total finance of $509 million will be required.

The new facility will be used to export Russian coal to the Asia-Pacific market and also help to overcome the existing shortage of export coal capacity in Russian ports in general. *BC*

Gijón consolidates leading position

In 2013, the Spanish port of Gijón grew by 3.21% in terms of dry bulk handled to 14.94mt (million tonnes), consolidating its position as the country's leading port for that traffic segment. Curiously, while El Ferrol reported a 14.3% decline in dry bulk, it nevertheless overtook Tarragona as Spain's second most important dry bulk port. Tarragona slipped to third place because of a 32.2% drop in traffic. In fourth and fifth place respectively were Cartagena and Bilbao, the latter edging out Huelva.

Gijón, Valencia, Alicante, Bilbao and Malaga all reported big increases in dry bulk traffic. *BC*

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Traffic at Ust-Luga continues to grow

By 2017, the Russian Baltic port of Ust-Luga will be handling more than 100mt (metric tonnes). This will increase to 170mt by 2020. Around $5.662 billion has been invested in the port, of which three quarters has come from the private sector. The port can handle vessels of up to 75,000dwt and has a deepwater area offering draught of 17.5m. Facilities are accessed via a 3.7km-long canal. *BC*

Liberian ports to handle Guinean iron ore

The president of Liberia has reiterated her country's intention to honour a memorandum of understanding signed with neighbouring Guinea to export iron ore through the Liberian port of Buchanan. The ore, which belongs to West Africa Exploration, will be mined at Nimba. *BC*

New Nacala port to open in December

Mozambique's Transport minister has said that the new Nacala-a-Velha port and coal terminal, as well as the railway line linking it to the Moatize mining district, would be ready by December. The transport link will have an annual capacity of 22 millions of tonnes, of which export coal will represent 18mt (million tonnes).

At present, export consignments from Moatize are sent via the Sena line to the port of Beira, whose capacity has been raised to 12mt per annum. However, this is insufficient to handle all the output, which could reach 100mt a year in the medium term.

The new railway, which is being built by Vale, involves the construction of several new stretches of line in Malawi to allow trains to access the existing northern line, which is being upgraded.

Within the next two years, a new coal terminal is also due to open in Beira able to handle 30mt annually.

In addition, an entirely new port will be built at Macuse, which will be connected to Matize by a further railway line also able to handle 30mt. *BC*

Vale exports to make use of Nueva Palmira

The Uruguayan port of Nueva Palmira is no longer able to receive inbound cargo from Paraguay after Argentina closed the transshipment facility on the island of La Paloma, citing reasons of security and non-fulfilment of investment. Previously, barge traffic from Paraguay made extensive use of this facility. The Argentinian move has resulted in the loss of 1.5mt (million tonnes) of cargo, given that the Uruguayan terminal used to receive around 200 barges monthly from Paraguay, of which half would make use of La Paloma.

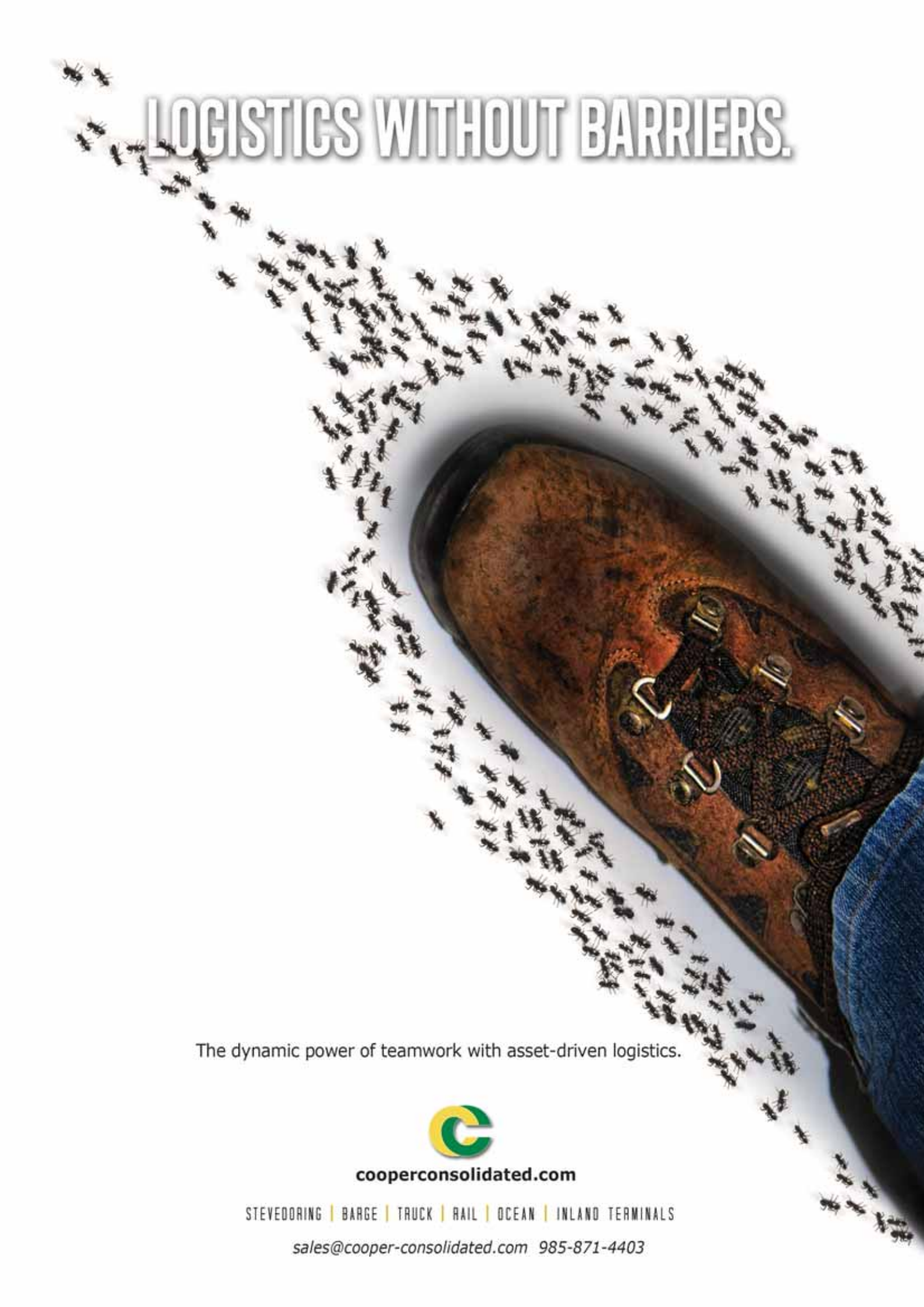
However, in a recent announcement, the Uruguayan Finance minister revealed that the Brazilian company Vale is now to make use of Nueva Palmira. Here, it will handle iron ore mined on the Brazil-Bolivian border which previously used ports in Argentina.

Nueva Palmira normally handles around 11mt a year, of which inbound cargo from Paraguay represents 45% of the total. For this year's harvest, Paraguay was expected to generate traffic of around 3mt for the port, although the loss of much of this traffic will be made up for by the capture of the new Vale contract. *BC*

Montevideo wants to attract containerized export soya

The management of the Uruguayan port of Montevideo is trying to provide incentives for local soya exporters to containerize consignments within the port. Due to local difficulties in respect of Argentinian transshipment container traffic, the port has lost substantial amounts of traffic, which it is trying to offset through the capture of new commodities.

Those companies reverting to this new way of despatching soya have found it to be cost effective, although the stuffing of containers on initial consignments was done outside the port. As a means of adding value, the port authority is now seeking a dedicated area within the port boundaries where these activities could take place. *BC*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Panama Canal expansion

a lull before the storm?

Ray Dykes

North American West Coast ports

North American West Coast ports are keeping a wary eye on the long-awaited Panama Canal expansion which should be completed in 2015 despite financial woes and delays.

However, in 2014 for every port worried about the threat of increased competition and losing business to East Coast North American ports, there's another just as convinced that the canal expansion may only allow that Central American country to maintain its business levels rather than steal trade away from West Coast ports.

The further north up the West Coast the port is, the less the concern appears to be about Panama Canal expansion and from about the Port of Portland onwards, there's more concern by United States ports over increasing competition from expanding Canadian ports.

And no wonder as both Port Metro Vancouver (easily the busiest West Coast North American port with total throughput of 135mt [million tonnes] in 2013) and the expanding Port of Prince Rupert — a day's sailing closer to Asia than Californian ports and boasting a 450% increase in profit since 2010 — had record years in 2013.

But, the $5.3 billion Panama Canal expansion bringing wider, deeper channels and new locks at both the Pacific and Atlantic ends is now 75% complete and could spring a surprise or two yet as it struggles to overcome a current $1.6 billion cost overrun with international arbitration now in effect and some interim stopgap financing agreed to push the project along through its Spanish-led European Construction consortium, Grupo Unidos por el Canal S.A. (GUPC).

The current period on the North American West Coast may well be looked back on in future years as the lull before the storm. After all, the intention from day one has been to "transform Panama into a first world country" and set up the city port there in strong competition with Miami as "the commercial gateway to the Americas" and in time big enough to rival Hong Kong.

All of which won't be sitting well with some East Coast ports in the United States that have spent billions of dollars dredging and expanding facilities and equipment to cater for the larger ships that will pass through the Panama Canal. Currently, the canal can handle container vessels of 5,000 TEUs (20-foot equivalent units), but the expansion will more than double this capacity to 13,000 TEUs.

On the West Coast, there's some comfort in the Port of Long Beach, at least, that the expanded canal will still not be able to handle the larger 13,000 to 18,000 TEU ships. Several of the North American West Coast ports already boast being 'big ship

ready' and note how shipping lines are consolidating their operations which will mean larger ships and fewer ports of call in future.

Many 14,000 TEU vessels already call at Long Beach and Art Wong, Assistant Director of Communications, says "generally, the canal's expansion will help it maintain its market share, but it isn't clear that it can significantly grow that market share."

And at the rival Port of Los Angeles, which is in the midst of a $1.1 billion capital improvement program of its own, the official view is that "we have been improving our facilities — investing in our cargo terminals as well as roads and other infrastructure — to prepare for competition."

Up and down the West Coast, all competition is taken seriously and the opening of the expanded Panama Canal in 2015 is serving as a riveting point of focus.

Here's *Dry Cargo International*'s annual review of North America's major West Coast ports from south to north and how each fared in 2013 and year to date (YTD) in 2014.

Long Beach CA

Even after a weak first quarter of 2014 because of poor weather elsewhere, the Port of Long Beach is hanging in there with a 1% climb through the end of April over the same period a year earlier. The No. 2 ranked port on the West Coast of North America recorded a throughput total in 2013 of 64,094,386 tonnes, still well ahead of rival Port of Los Angeles.

Containers continue to dominate trade and they totalled 6,739,573 TEUs in 2013, up 11.3% and were up in exports, imports and even empties through April 2014. Inside those boxes, home appliances climbed by 243% in 2013 over 2007 levels, but home electronics slipped by 44% in the same period and paper and paper products dropped by 40%.

A recent report by the Los Angeles 2020 Commission (an independent group of business, labour and civic leaders) recommended a merger between Long Beach and Los Angeles because of a 5% drop in market share for the two ports over the past decade. The commission said the drop represented 60,000 jobs and $100 million in revenue and "we should fight to bring those jobs and tax revenues back to Los Angeles."

The merger got a quick dismissal by local port officials.

2013 TOP WEST COAST PORTS

by total tonnes

Rank	Port	Million tonnes
1	Port Metro Vancouver	135.0
2	Long Beach	64.1
3	Los Angeles	50.7
4	Prince Rupert	23.0
5	Tacoma	16.2
6	Seattle	16.1
7	Oakland	11.7
8	Portland	10.8
9	Port Vancouver USA	4.9

"Simply put, this is a bad idea, said Doug Drummond, President of the Long Beach Board of Harbour Commissioners. "The Port of Long Beach is not interested in a merger with our neighbour . . . I can assure you the Port of Long Beach is better run by the citizens of Long Beach."

Meanwhile, the Port of Long Beach continues with a $4 billion, decade-long capital improvement programme it began in 2011 to upgrade terminals, replace the port's Gerald Desmond Bridge by 2017 to allow 18,000 TEU ships to pass under it, increase on-dock rail and other projects "to accommodate the next generation of big ships and remain competitive."

And as for where competition is coming from the answer is given as "North America – Canada, Mexico, US East and Gulf Coasts — and right next door at the Port of Los Angeles."

The port mixes incentives and regulations in a series of 'green programmes' aimed at reducing air and water pollution providing stakeholders "with the flexibility to meet our environmental standards while still growing their business."

Los Angeles CA

The Port of Los Angeles, which has been ranked the 'nation's busiest port' when it comes to containers since 2000, acknowledges it faces competition on many fronts — 'other West Coast ports, Canadian ports, new terminals in Mexico and

Bulk handling at the Port of Portland.

WE DO BULK

and other breakbulk cargoes

SHIPS - TRUCKS - TRAINS

The Port of Stockton is located in Foreign Trade Zone #231 in California. Close to I-5, the port is an international 35-foot deep-water port with more than 2000 acres for import/export cargo, 17 deep-water berths and seven million square feet of covered storage.

The port is an overweight corridor connection for rail-bound heavy cargoes between Asia and U.S. The port has more than 70 miles of railroad on port property. It is served by both the Union Pacific and Burlington Northern Santa Fe. The Central California Traction Company (a wholly owned subsidiary of both railroads) provides switching and track maintenance services. The port expanded the rail intermodal section to have four 800-meter tracks of a half-mile each available for component storage and staging.

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Bentonite at Port Vancouver USA.

East Coast ports/ Panama Canal' — and has just come through a tougher patch.

The port experienced a drop of almost 5.5mt in throughput from its record total in 2012, finishing up 2013 moving 50,670,753 tonnes. There is a brighter outlook, however, through the end of April with total throughput up 8.2% compared to the same period of 2013.

Containers dominate traffic statistics, reaching 7.9 million TEUs in 2013 (a record 8.5 million TEUs was set in 2006) and cargo value reach $285 billion — no wonder Los Angeles is the top Customs office in the nation. The port relies heavily on Asian trade with China/ Hong Kong dominating its traffic statistics.

Like its rival Port of Long Beach, the Port of Los Angeles is in the midst of its own $1.1 billion capital improvement programme, investing in cargo terminal improvements as well as roads and other infrastructure. A $383 million thrust in this programme is aimed at reducing and separating port truck traffic from public roadways.

A $155 million Berth 200/ Pier A/ West Basin Railyard project when completed will eliminate 2,300 daily truck trips from the Long Beach 710 and Harbour 110 Freeways.

New container business came in the form of United Arab Shipping Line starting LA service. The port is already big ship ready with a 53-foot draught.

On the environmental front, the Port of Los Angeles regards itself as a global leader and has reduced diesel particulate matter over the past five years by 79%, nitrogen oxides by 56% and sulphur oxides by 88% through such schemes as alternative maritime power, more environmentally friendly cargo handling equipment, and a Clean Truck Program.

Oakland CA

Containers rule at this northern Californian port and total throughput reached 11,692,859 tonnes in 2013. Through the end of April 2014, the port handled 765,781 TEUs and is third

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ranked behind its southern sister ports, Los Angeles and Long Beach. However, Oakland doesn't see the expanded Panama Canal as a threat "as we have a good balance of imports and exports."

The largest container port in northern California does not have any local competition and is "the primary export port in the country when it comes to agricultural goods."

Late in 2013, it introduced a shoreline power scheme and says it has made "great strides in improving port operations through its 'green' truck programmes."

Oakland City and the port broke ground last November on a $500 million 1st phase to redevelop 360 acres of land at the former Oakland Army Base, immediately adjacent to the port. The Oakland Global Project will create a world-class trade and logistics centre with over one million square feet of new warehouse space where exports and imports will be offloaded and repackaged. The next phase will include enhanced near-dock rail, an intermodal yard, and cold storage and logistics facilities.

Portland OR

At 10,829,590 tonnes handled in 2013 (down 3.4%), the Port of Portland in Oregon relies heavily on bulk for its success, led by potash from Canada and soda ash from Wyoming. Several western states ship grain through the Columbia River port, which is situated 70 miles east of the Pacific Ocean.

Container traffic at 178,451 TEUs ranked third last year overall in tonnage, followed by iron and steel imports from Russia, Mexico and Canada. Seven companies ship autos through the port and in a switch, US vehicle exports began to South Korea in 2012 and China in 2013. Other commodities include liquid bulk imports (agricultural fertilizers) and project cargoes such as generators, turbines and transformers.

This year through April, the port's tonnage is running 9.4% ahead of the same four months of 2013 with container traffic slumping by nearly 12% (a lingering dispute between unions nearly cost Portland its major customer Hanjin Shipping but the port offered incentives and the line stayed). This past April was the highest single month for break bulk in over a decade and export auto volumes by then had already eclipsed the entire 2013 total.

Recent port improvements include a new terminal entrance road, rail upgrades and the removal of old equipment from two terminals for salvage. Columbia Grain has a $40 million expansion underway. The Portland Bulk Terminals/Canpotex is buying a $30 million new shiploader and is mulling further expansion. Kinder Morgan/ANSAC built a new $9.5 million shiploader and has expansion plans before the Port Commission.

A port tenant is now handling sulphuric acid at Terminal 4 and larger scale roll-on/roll-off business is being planned at Terminal 6. Bulk, break bulk and autos are being targeted by the port to spearhead future growth.

Port Vancouver WA

Just across the Columbia River from Portland, Port Vancouver USA in Washington shipped 4,480,605 tonnes in 2013 and that was down 1.6% from 2012 volumes.

As one of the few ports on the West Coast that doesn't handle containers, the expanded Panama Canal is not seen as a threat with the main competition coming from Californian ports and the Mexican Port of Guaymas.

Dry cargoes handled in 2013 were dominated by agricultural exports such as corn, soybean and wheat (2,809,103 tonnes) but also included lesser amounts of imported bauxite (6,232 tonnes), export bentonite (99,457 tonnes), and other exports including copper (366,206 tonnes), and mill scale (22,164 tonnes).

YTD through April saw total throughput at 2,089,634 tonnes and that was a significant increase (47%) over the same period a year before thanks largely to increased shipments of agricultural products through the port's elevator.

In 2014, Port Vancouver USA welcomed back urea import shipments after a six-year hiatus and is expecting its best year for the commodity. In July, the port expects to handle its first shipment from the Far East of ceramic proppants used in fracturing and heading to the US and Canadian hinterland, especially North Dakota.

The river port is past the midway point in a 10-year, $275 million rail improvement project to increase cargo handling speed and efficiency by taking rail track from 17 to 52 miles, boosting unit train receiving and dispatching, and adding a new entrance direct from the Burlington Northern Santa Fe main line.

Seattle WA

The third year of declining TEUs in 2013 at 1,592,753 (2010 was the best recent year at 2,153,685 TEUs) has some pushing the merits of a merger with Puget Sound rival the Port of Tacoma.

According to global logistics advisers, Mercator International, the container shipping business in the two Washington ports is vulnerable to poaching by competitors on the East and West Coasts and is exacerbated by a lack of co-operation and current inter-regional competition. The report suggests the marine operations at both ports are well below capacity and "must undergo major improvements to stay competitive."

Earlier this year, the Federal Maritime Commission approved a request from the two ports to begin information exchanges aimed at boosting container traffic.

And Port of Seattle CEO, Tay Yoshitani, suggested consolidation of the two ports is something that should be considered. "Nothing is off the table," he said. "The shipping lines are consolidating to form alliances and it might be worthwhile for the ports to look at it."

In 2013, the Port of Seattle moved 16,011,122 tonnes — its worst year in a decade — after losing some container business to Tacoma. Grain and molasses shipments were down, while petroleum was up but still below the performance of most of the past decade. YTD figures through April saw TEUs in decline by 5.3%.

In May, the Port of Seattle and Eagle Marine Services,

operator of Terminal 5, tentatively agreed to relocate its cargo and break bulk to another facility so that Terminal 5 can be made 'big ship ready'. The port has also received federal approval to let the US Army Corp of Engineers study the potential of deepening the West Waterway Channel near that facility.

Tacoma WA

Throughput in 2013 for the Port of Tacoma came in at almost the same numbers as 2012 recording 16,238,606 tonnes, including 1.9 million TEUs. This year is zinging along with container volumes in April up 10% over the same month in 2013 and YTD figures through April for boxes up 3% at 633,225 TEUs.

China/Hong Kong and Japan dominate trade with Tacoma with grain leading the bulk goods at 2.44mt. The pace has continued for grains this year and exports shot up 31% through April as volumes appear to be returning to normal after a severe drought in 2012 in the US Midwest and increased competition from South America.

Auto imports and break bulk cargoes also show YTD increases, but log exports fell 32% as the housing market slowed in China.

Last year, the port made a switch to break bulk operations at its East Blair One Terminal (rail will be expanded onto the terminal later) and work is underway in a $20 million project strengthening the Pier 3 at Husky Terminal and adjacent Pier 4 so they can handle larger cranes and 18,000 TEU vessels. In June, the Port Commission approved $5.8 million for work associated with the reconfiguration of the two piers into one stretching 2,960 feet.

Competition is very much on the Port of Tacoma's mind and even though it is now sharing information and co-operating more than ever with rival Seattle, there have been no formal merger talks . . . except in the news media.

"Competition is everywhere," says Tara Mattina, Port of Tacoma Communications Director. "The industry remains fiercely competitive . . . Port Metro Vancouver and Prince Rupert continue to aggressively market services to the US Midwest which we also serve."

As for the Panama Canal, Mattina says it is still unclear how much Tacoma might be affected. "Rates and the ability of East Coast and Gulf Coast terminals to handle the bigger ships certainly will be factored into how much, if any, cargo is diverted from the West Coast, which has naturally deep water and the ability to handle the largest ships in the trans-Pacific trade."

Port Metro Vancouver BC

With its best year in history in 2013 at 135mt — up 9% over its 2012 record of 124mt — Canada's largest port is also the most diversified on the West Coast of North America. In 2013, Port Metro Vancouver, which handles 19% of the nation's trade or half a billion dollars in goods daily, increased both imports and exports by the same 9%.

Container volumes increased by 4% to a record 2.83 million TEUs, while bulk — largely coal, grain and fertilizers — were up a combined 11% at 92.7mt.

Coal had an excellent year up 17% at a record 38.1mt, while wheat was up 26% at 7.6mt, barley up 273% at 401,822 tonnes, and specialty crops up 58% at almost 3mt.

Wood chips had a healthy year up 7% at 7.5mt; potash was up 20% at 6.9mt, and chemicals, basic metals and minerals at 11.2mt were up 15%. Needless to say the port had a 12% increase in overall revenues and continues to enjoy an AA credit rating.

YTD through April saw coal shipments — the major bulk

item — keeping pace with the same four months a year earlier, chemicals, basic metals and minerals up 26.5% and grain up 1.6%, but forest products (down 14%), petroleum (down 17.4%), and total shipments down 2.5%. Container traffic was on about the same pace as last year despite a pesky truck strike.

PMV doesn't see the expanded Panama Canal as a threat — most of its import containers are heading by rail to Eastern Canada and a southern all-water route would take considerably longer and bring no cost savings.

Not all is sweetness and light, however. Even though it has been successfully moving coal exports for 44 years, PMV finds itself up against organized opposition — including municipalities, health officials, environmentalists and other activists — over a $15 million Fraser Surrey Docks proposal to receive US coal from the Powder River Basin by rail and then barge it along the Fraser River to an existing export facility on Texada Island in the Strait of Georgia for offload onto deep-sea ships bound for Asian markets. The port, as the sole approval authority, has asked Fraser Surrey Docks for a wider health review as part of the environmental impact review and has yet to make its decision on the proposal.

Port Metro Vancouver President & CEO, Robin Silvester, has probably been asked more questions about the proposal to move US coal than any other question in the past year and has repeatedly said the port is one link in the coal supply chain running through national and provincial decisions to develop Canada's abundant natural resources and "cannot dictate what is exported." As widespread opposition continues in the Pacific Northwest to increased coal shipments, it is no wonder that efforts on the US West Coast to develop their own coal export terminals over the past couple of years have gone from about seven separate projects in Washington and Oregon down to only three with nothing certain anytime soon.

On the environmental front, Port Metro's EcoAction Program is reducing marine emissions — exceeding current North American Emission Control Area requirements — and in 2013 some $1.2 million was given in discounts to vessels going beyond current emission requirements.

Prince Rupert BC

The darling of British Columbia trade with seemingly more success stories in recent years than any other port on the continent, Prince Rupert enjoyed another record year in 2013 at just over 23mt, up 3.4% over a record year in 2012.

Rivals will delight that the going is a little tougher so far in 2014 with YTD to the end of April showing containers down 1.07% over the same four months of 2013 and coal exports off 22.4% at 2.9mt. The good news is that grain was up 4.5% (including record volumes of canola up 32% over 2012 levels) and tonnage from a recently opened wood pellet terminal at 131,897 tonnes YTD was helping offset declines in other commodities. With its secure rail links to and from the US Midwest and location a day sailing closer to Asia than most US West Coast ports, Prince Rupert doesn't see the Panama Canal as a serious threat.

Along with the new Westview Wood Pellet Terminal, other capital works abound including the $200 million doubling of capacity at Ridley Terminals, the 'up for sale', federally-owned coal export facility; a $90 million rail and road corridor to increase capacity between Ridley Island the Prince Rupert's city mainland should be completed by October; and the sole container mover, Fairview Terminal is up for major expansion should operator Maher Terminals see value in the commercial investment to take capacity from the current 850,000 TEUs to 1.3 million TEUs.

But, that's just the start. Two proponents have rival liquefied natural gas plant plans for port lands — Pacific NorthWest LNG through Petronas and Prince Rupert LNG through the BG Group — and could spend $20 billion between them getting up and running. One is at the feasibility stage and the other is amid its environment assessment.

The prospects of developing a former pulp mill and deep-sea dock site at Watson Island near Ridley Island into a modern, multi-product facility is tangled in yet another legal dispute, this time between would-be developers Colonial Coal International, of Vancouver, and its WatCo subsidiary and the City of Prince Rupert. DCi

Coal shipments out of Westshore Terminals at Port Metro, Vancouver.

Third Siwertell road mobile cement unloader order aids Libyan reconstruction

The Turkish construction services company Mussa Insaat Dis Ticaret Ltd of Istanbul has ordered a further road-mobile Siwertell 10 000 S cement unloader from Cargotec. The trailer based, diesel powered unit will have a rated discharge capacity of 300tph (tonnes per hour) and will be equipped with a dual bellows system and dust filter. Delivery is scheduled for the end of September 2014.

"This is the third road mobile cement unloader order for the same customer within a very short period," says Jörgen Ojeda, director for Siwertell mobile unloaders. "It will take its place in our customer's cement unloading operations at several sites along the Libyan coast, helping to meet the demand for cement needed for the country's extensive rebuilding programmes. The customer ordered this third unloader to further strengthen its position on the Libyan market.

Siwertell mobile unloaders are ideal in these circumstances, because they have the flexibility to unload cement at the most convenient port for the work in hand, cutting road transportation to a minimum. Not only is a mobile unloader easy to move from one port to another but once at its new location, the unloader can be prepared for work very quickly by just one person.

"This repeat order indicates a very satisfied customer that appreciates the well known reliability of Siwertell mobile unloaders, along with their high unloading capacity and low operational and maintenance costs," adds Ojeda.

Siwertell ship unloaders and loaders are based on unique screw conveyor technology, in combination with belt conveyors and aeroslides, and can handle virtually any dry bulk cargo, such as coal, cement, fertilizer, agribulk, clinker, sulphur and grain. Siwertell plant and terminal design, ship unloaders, shiploaders, mobile ship-unloaders, mechanical and pneumatic conveying systems, and storage solutions are all designed to ensure environmentally friendly and efficient cargo operations.

Metso wins Codelco Chuquicamata mine contract

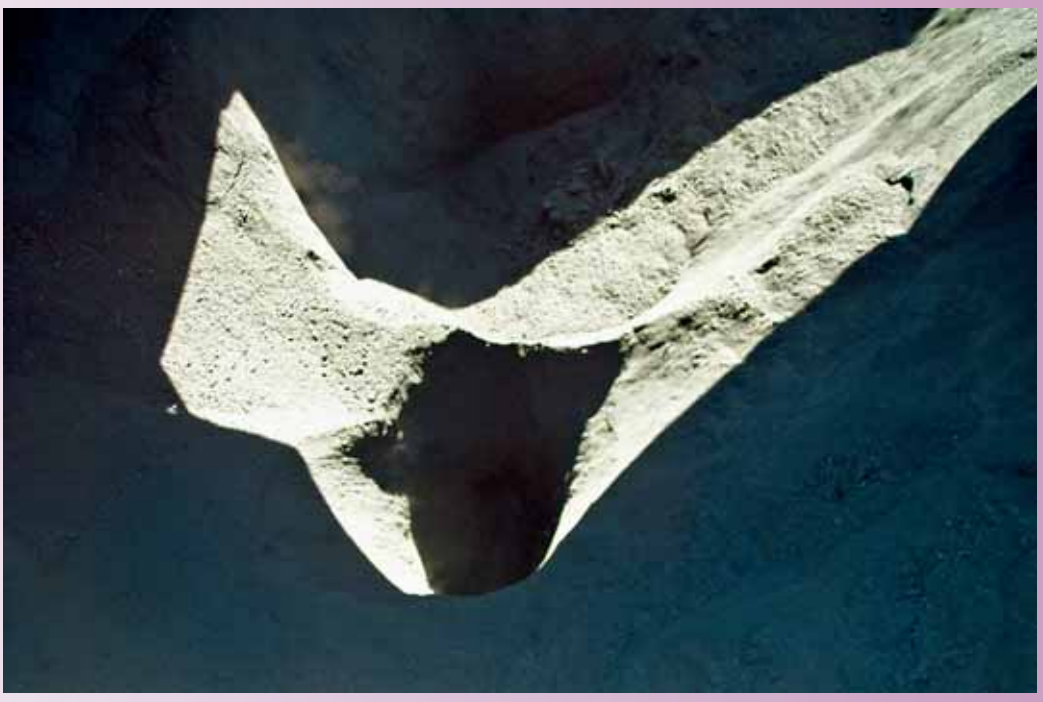
Metso has signed an 18-month services contract with Codelco's Chuquicamata mine. Codelco is the biggest state-owned enterprise in Chile and the world's largest producer of copper.

The contract covers changing the components to 33 ball mills currently operating in the A0 and A1 plants in the Codelco Chuquicamata mine. The work will involve changing the pinion-gear assembly as well as repairs to the shell. Metso will repair two mills per month and also take care of the continuous monitoring of the status of the equipment. The value of the new contract will not be disclosed.

"Codelco chose Metso due to our expertise in similar type of projects," states Eduardo Nilo, Services Director for Metso's Mining and Construction in Chile.

The agreement, which covers gear disassembly, new gear assembly, pinion assembly, gear alignment (slow rotation) and mantle repair, took effect in April 2014. The contract will create 30 new Metso services jobs in the Northern part of Chile. The order has been included in Metso Mining and Construction's Q1 2014 orders received.

Alumina trihydrate flows reliably with new silo design



Jenike & Johanson is a leading company in powder and bulk solids handling, processing, and storage technology. Over the past 55 years, it has tested over 11,000 unique powders and bulk solids and worked on more than 7,500 projects, giving its team broad real-world and in-depth experience in the industry to address a wide variety of bulk material handling and engineering needs.

Its mission is to create value by assisting clients improve the efficiency, reliability, and safety of their operations by preventing, eliminating, or reducing problems related to bulk material flow, storage, conveying, or processing.

One of Jenike & Johanson's recent projects in the bauxite/alumina field was carried out at Kaiser Aluminum & Chemical Corporation in Baton Rouge, Louisiana.

The need

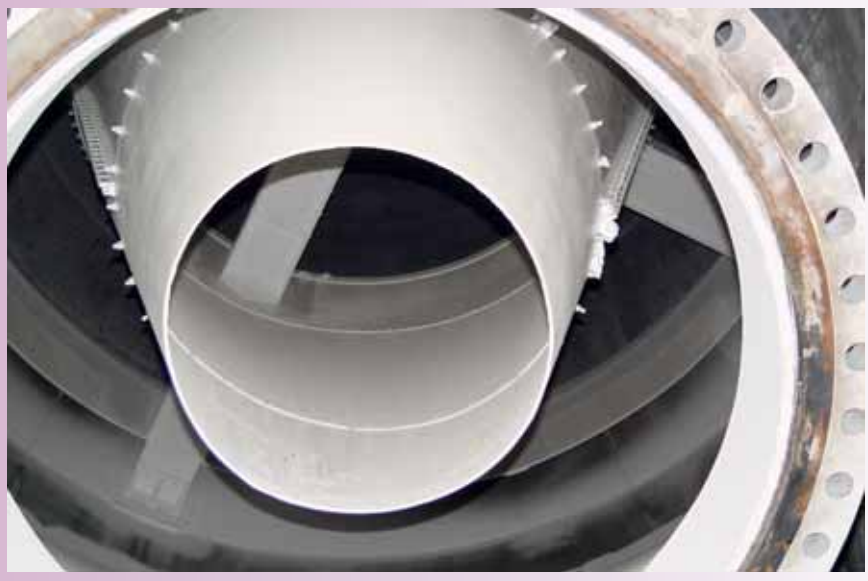
Kaiser Aluminum & Chemical Corp. produces alumina trihydrate which is calcined to make alumina, or it is dried and sold as hydrate. In addition to these two end products, Kaiser wanted to

courtesy of Jenike & Johanson

sell its wet alumina trihydrate.

Kaiser needed a new, dedicated handling and storage system. According to Chess Millburn, a project engineer at Kaiser, "The handling characteristics of the wet alumina trihydrate were unknown to us. Just looking at the material, you could tell it was very different than the dry product. There was a general feeling among the plant personnel that we would have major difficulties handling it."

- **needs addressed:** address process non-uniformity, solve or prevent poor flow
- **bulk material handled:** alumina trihydrate, alumina, bauxite
- **equipment:** storage, feeder.



The solution

After Jenike & Johanson's site visit, it was decided that the next step was to test a sample of the alumina trihydrate in its laboratory, duplicating the process conditions.

J&J found that the wet cake was cohesive enough to arch and form stable ratholes in funnel flow silos and that a third flow pattern, expanded flow, would be most suitable. Expanded flow combines mass flow and funnel flow and consists of a mass flow section at the bottom of the silo, extending up to a large enough diameter to prevent the formation of a rathole. Above this mass flow section, the silo is designed for a funnel flow pattern.

The result

Kaiser installed the recommended silo and loadout bin and they have been reliably handling the wet alumina trihydrate since startup.

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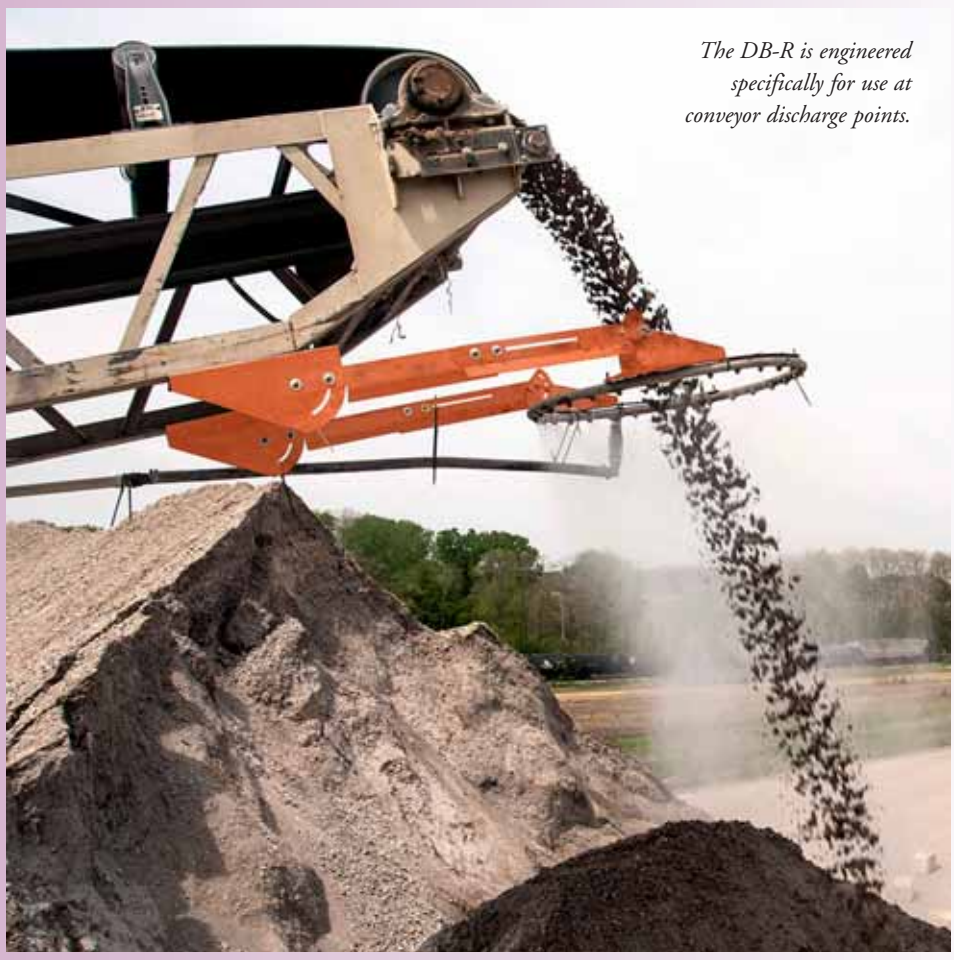
Adjustable bracket for dust suppression ring

Dust Control Technology, a renowned provider of open-area dust suppression systems, has introduced a family of adjustable mounting brackets for the popular DustBoss® DB-RTM series of dust suppressors. Developed in direct response to customer feedback, the new bracket design is available to suit the entire range of ring sizes from 17-100 inches, and can be installed in about an hour. The DB-R is engineered specifically for use at conveyor discharge points, designed to create a virtual 'curtain' of mist around the material flow for outstanding particle containment.



The DB-R is engineered specifically for use at conveyor discharge points.

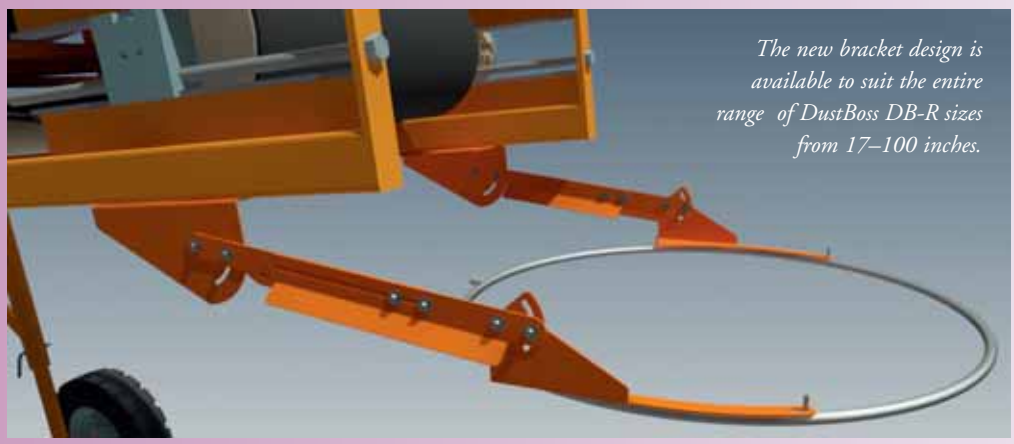
"Because of the wide variation in conveyor designs, in the past we've left the mounting of the rings to the individual customer," explained Dust Control Technology CEO Edwin Peterson. "But it was clear that customers looked to us for guidance. So now we've designed an adjustable bracket that can fit virtually any conveyor design, with movable arms to allow precise location of the atomized mist circle to match the specific conveyor, material and outflow."

First developed for a coal application, the DB-R fully encircles the discharging material to apply suppression directly as the flow exits the conveyor. With no moving parts, the simple yet effective engineering delivers focused dust suppression on a continuous-duty basis, able to capture fugitive particles on radial stackers and other offloading points with a durable, intrinsically safe design. The solution is straightforward but effective, and customers are finding that it's well suited to conveyor discharge of sand, aggregates, biomass and other traditionally dusty materials.

"For some bulk material handlers, it can be a very affordable alternative to more extensive dust management tactics," Peterson said. "Larger operations are finding that the source-point suppression of the DB-R is the perfect complement to their open-area dust control measures."

The DB-R is currently available in nine standard sizes (17–100"/43.2-254 cm) in diameter. Available options for the DB-R include a booster pump to elevate low water pressures, a variety of nozzle sizes/configurations and water filtration. Customers can also order the units with a two-way valve and/or hose included.

Dust Control Technology is a major provider of dust management solutions, with expertise in demolition, scrap and recycling, mining, coal handling, steel/slag, ports and shipping. The company specializes in atomized mist technology, with its focus on equipment for dust suppression and odour control. All of the firm's R&D, experience and expertise is centred completely around those applications, and its staff helps customers analyse particle sizes, working environments and other factors to ensure effective performance under real-world conditions. DustBoss units are far more effective and efficient than manual spraying, with some customers realizing payback in less than six months. With customers in 35 countries on six continents to date, DCT equipment carries an industry-best warranty of three years/3,000 hours, and can be purchased outright or rented from an extensive equipment fleet.



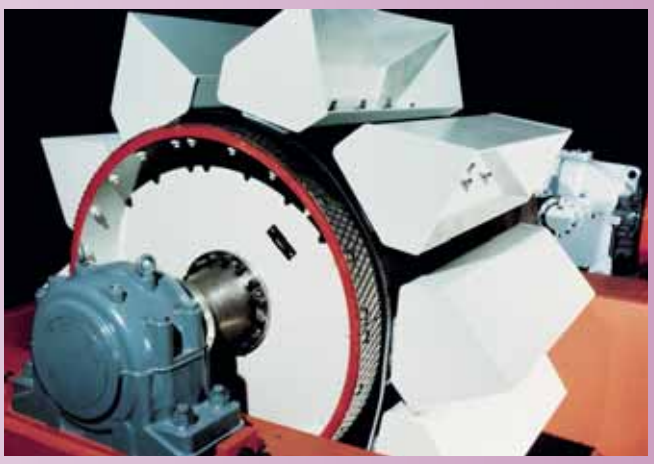
The new bracket design is available to suit the entire range of DustBoss DB-R sizes from 17–100 inches.

EuroChem uses AUMUND bucket elevator to transport ammonium sulphate

With the expansion of its own Division Mineral Processing, AUMUND Fördertechnik has laid the foundations to market conveyors and bucket elevators for the transport of bulk materials in industries beyond cement successfully. The company acts for the cement industry partially as a market leader worldwide. This year, AUMUND will deliver a bucket elevator to the Antwerpen plant of EuroChem (BASF) for the transport of ammonium Sulphate. The substance to be used as fertilizer amongst other is a byproduct of the production of plastic.

In this plant, the AUMUND belt bucket elevator with a bucket width of 1,250 millimetres and an axis-centre distance of 42 metres replaces a still existing bucket elevator. The challenge for the planners of AUMUND and EuroChem is not only to exchange the existing bucket elevator but to install a machine within the existing building, that about doubles the capacity of the existing bucket elevator to a performance of 800tph (tonnes per hour).

By the end of 2014, the old bucket elevator — a low speed device with middle extraction — will be replaced by a high speed AUMUND belt bucket elevator. Besides the bucket elevator, AUMUND will provide a distribution chute and several connective chutes. Due to the corrosive atmosphere at the plant, the bucket elevator will be built completely of stainless steel. Plastic sheet will be employed as wear protection.



About the AUMUND Group

The AUMUND Group is active worldwide. The conveying and storage specialists has special expertise at its disposal when dealing with bulk materials. With their high degree of individuality, both its technically sophisticated as well as innovative products have contributed to the AUMUND Group today being a market leader in many areas of conveying and storage technology. The manufacturing companies AUMUND Fördertechnik GmbH (Rheinberg, Germany), SCHADE Lagertechnik GmbH (Gelsenkirchen, Germany), SAMSON Materials Handling Ltd. (Ely, England), as well as AUMUND Logistic GmbH (Rheinberg, Germany) are consolidated under the umbrella of the AUMUND Group. In conjunction with the headquarters of the manufacturing companies, the global conveying and storage technology business is spearheaded through a total of eight locations in Asia, Europe, North and South America.

Quality and performance: the watchwords of Negrini grabs

It is well known that any good machine — whether it is a cable crane or a hydraulic excavator — will only perform at its best if the attachment used to work with it is well engineered and manufactured. In fact, a high-quality attachment not only does a good job, but it also reduces machine stress, allowing for safer working and helping to save energy.

That's why choosing the right attachment is one of the main concerns for any wise contractor and a very important factor in guaranteeing the successful outcome of any job.

Over the last 47 years, the Negrini company has engineered and manufactured attachments of the highest quality. These include: mechanical and hydraulic clamshell buckets; cable clamshell buckets with radio-controlled release; orange peel buckets both mechanical and hydraulic; two- or four-rope scoop grabs; dragline grabs; trenching mechanical clamshell buckets; and buckets with special designs for controlled digging depth and special valves that are widely used to collect polluted mud from the sea or river bed.

Since 1967, the Negrini company has engineered, manufactured and supplied contractors and port authorities with buckets for all those jobs and every bucket has been a success. That's why Negrini has gained a very good reputation in this field.

Buckets like those that Negrini delivers worldwide are often engineered by some manufacturers in such a way that the end product is heavy and clumsy. Negrini's engineering concept is different because its engineers believe — and decades of practice show they're right — that heavier buckets are not always stronger; in fact they prefer to combine a large use of high tensile steel like Hardox with very accurate engineering. In this way Negrini buckets are more resilient and yet lightweight, thus enhancing performance whilst granting significant energy savings.

All this is the result of Negrini's long experience built up by case-by-case studies.

Negrini's attachments are at work in many different parts of the world: from Italy to the United States, and from the Gulf countries to Australia, Negrini is the brand of choice for many contractors.

One source of satisfaction for Negrini is the recent sale of ten units, in co-operation with the company Lameter srl of Genova, destined for the Asian market and more specifically, Qatar.

This is one of the most important business deals ever made by the company, not only in Italy, but worldwide.

The contract includes hydraulic graps for excavators for the handling of heavy material (heavy duty).

In recent years, the company has expanded its client base, including a number of important foreign companies operating in the port sector and construction equipment. Over the last few years, the equipment has been in operation in the most important ports and quarries in the world.

The success of Negrini's products has increased dramatically in recent years, confirming that performance and quality are decisive factors for contractors that want attachments for their most demanding jobs.

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MANTSINEN

Mantsinen 200 M HybriLift®— world's strongest hydraulic material handler

The next revolution in port handling

Finland-based Mantsinen Group Ltd Oy is steadily becoming larger and faster. The newest addition to Mantsinen's range of hydraulic material handlers is the Mantsinen 200 M HybriLift®, world's largest wheel-based hydraulic material hander to date.

The Mantsinen 200 M HybriLift® is aimed at sea ports and river ports handling barges and vessels up to Handymax size. Hydraulic material handlers are best known for effective bulk handling thanks to the short cycle time and high productivity. The Mantsinen 200 M HybriLift® brings these benefits also to container handling and breakbulk.

For example, heavy steel products like coils or billets can be precisely and safely unloaded/loaded with over 45 cycles per hour. With a quick change of attachment, the Mantsinen 200 M is ready for bulk handling with even shorter cycle time.

The robust wheel base of Mantsinen 200 M HybriLift® is ideal in large port areas, where machines have to be driven long distances on a regular basis. Despite Mantsinen 200 M HybriLift® weighing about 270 tonnes, depending on configuration, it has a travel speed up to 5km/h and a turning radius less than 12m.

Mantsinen had already introduced its energy storage and recovery system HybriLift® to markets in 2008. The Mantsinen 200 M HybriLift® has a strong and proven track record to improve energy efficiency by up to 35%. During each working cycle, energy is stored in hydraulic accumulator system and again recovered to lift the main boom. The Mantsinen 200 M HybriLift® also allows the use of downsized engines and motors with lower emissions, improved fuel economy and lower maintenance costs.

Mantsinen's 200 M HybriLift® can be customized to individual customer's needs. The Mantsinen 200 is available with diesel engine or electric motor, various undercarriage heights and front equipment configurations, several cabin positions including cabin elevators plus a wide array of optional items, such as remote access to the machine control system etc. The walk-in upperframe structure allows easy and safe maintenance indoors.

The world's first Mantsinen 200 M HybriLift® will be delivered to the Antwerp port area, Belgium, in July 2014, together with dealer Heavy Handling. The future owner of the machine, Goeyvaerts R. bvba, is excited to add the machine to its fleet.

"During the test drive we were extremely impressed with the speed and precision of Mantsinen 200 M. We believe that this machine changes the game in large ports and brings our productivity to the next level," commented Kevin Goeyvaerts.

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DOS SANTOS INTERNATIONAL

DSH Systems moves into the big time with very high-capacity units

After many years successfully supplying industry-leading dust control systems, DSH Systems Ltd has added to its mainstay markets of truck, train and storage shed loading, by moving into very high capacity shiploading units.

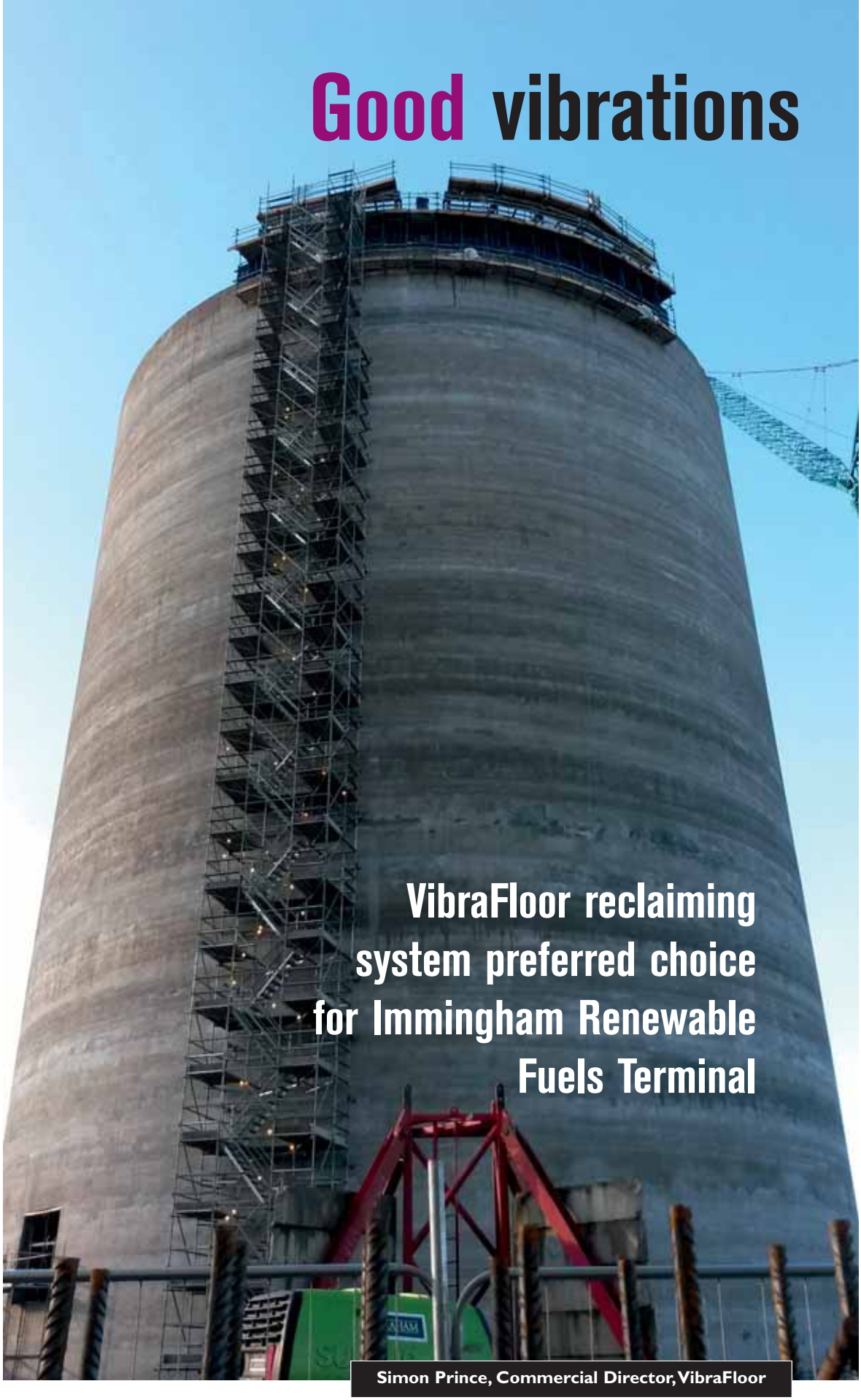
With its global reputation being built around the 200 to 500tph (tonnes per hour) range and having globally supplied hundreds of these units into a variety of industries loading numerous types of products, DSH Systems Ltd was asked to supply a much larger unit for the sugar industry in South America.

Designing upward from its existing range of models, the company manufactured and installed a DSH7 unit capable of loading sugar at 1,500tph. Based on the overwhelming operational results and dust reduction achieved compared to conventional loading spouts, the same end user has now ordered a DSH8 and DSH9 unit. This takes the loading capacity up to an impressive 2,500tph and 3,000tph respectively.

These units follow on from equipment supplied into the European market for barge loading. DSH Dust suppression hoppers are already loading on a daily basis products as diverse as fertilizer, soda and palm kernel extract. The DSH units have been installed to a variety of existing ship-loading units ranging from smaller mobile belt loading systems, up to major systems with long drops via telescopic spout units.

The company has not forgotten it roots and still supplies a growing number of units into the small to mid-range capacity market, but the addition of these latest high capacity systems adds another weapon to its already strong stock of dust reduction solutions.

Good vibrations



VibraFloor reclaiming system preferred choice for Immingham Renewable Fuels Terminal

Simon Prince, Commercial Director, VibraFloor

The strategically placed coastal ports have, for very many years, played a key role in both the export and import of huge volumes of fossil fuels used to keep the lights switched on and the wheels of commerce turning across Europe.

Millions of tonnes of fossil fuels — specifically coal — have, for generations, passed through these gateways, destined to fuel large industries including the fleet of coal-fired power stations. For decades these facilities have formed the core of power generation across northern Europe at a time when the priority was simply to generate power, no matter what the

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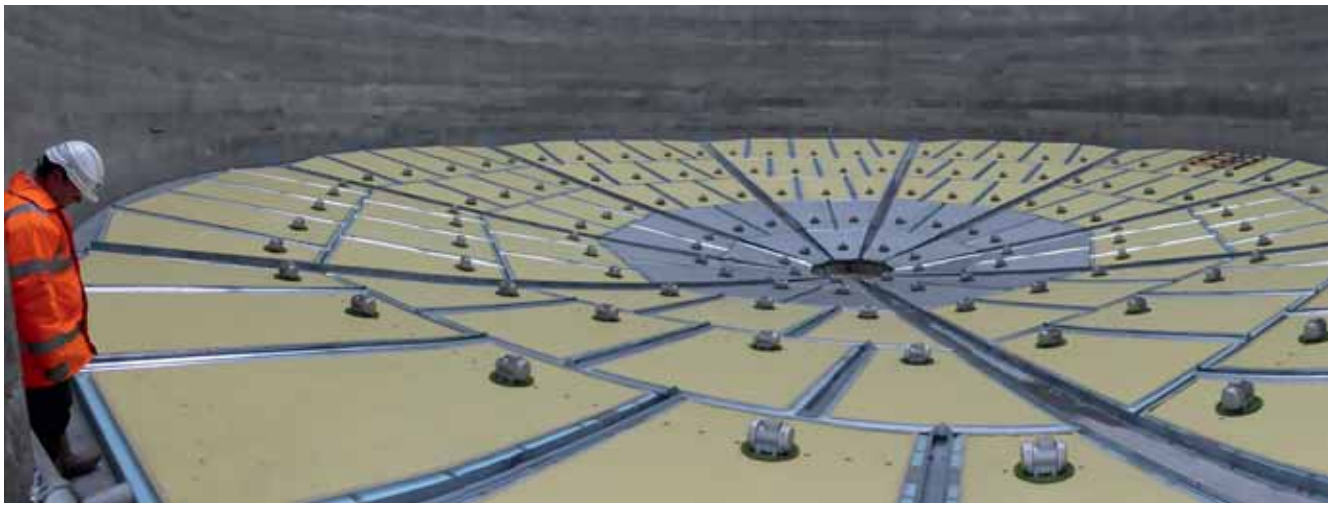

environmental cost.

In the drive to improve energy efficiency and reduce the carbon footprint of the energy generating industry, large-scale investments have been made, or are in the process of planning, to convert many existing coal power stations to co-firing units, consuming a more sustainable fuel diet which includes large volumes of biomass and wood pellets.

Drax Power, located near Selby in the UK, is a leader in the move away from fossil fuels. It has invested heavily in new combustion technology and the associated storage and handling facilities, which will not only store 450,000m^3 of wood and agri pellets, but will also have an annual appetite of 7.5mt (million tonnes) of biomass sourced mainly from the US and Canada.

This surge in demand has meant not only must the power stations make significant investments, but also the port facilities such as Immingham, Liverpool, Port of Tyne and Teesport. At these sites large ships are unloaded and their cargo temporarily stored in a variety of covered silos and buildings before onward transfer via rail or road transport to the power stations.

Investment

Immingham Renewable Fuel Terminal (IRFT) is one such facility, located at the UK's Port of Immingham and owned by Associated British Ports (ABP). In March 2013, ABP signed a 15-year contract with Drax Power, a deal which has enabled ABP to invest £100 million (€119.6 million) in its Humber terminals at Hull, Goole and Immingham, with the largest proportion of that investment — £60 million — being made in the Port of Immingham. Graham Construction was awarded an 18-month contract to undertake the design and construction of the Immingham terminal, with a target completion date in October 2014. VibraFloor is discussing phase 2 of the project with the client, with a view to agreeing terms very shortly.

The Port of Immingham is the UK's largest handler of dry bulk cargo and has always been an energy port since it opened just over 100 years ago. The new biomass terminal will be an 11.5-acre fully automated bulk handling facility constructed adjacent to the existing coal terminal.

Unlike coal, wood-pellets need to be stored carefully and kept protected from the weather. They are also dusty and must be handled correctly in order to control emissions and either manage or eliminate fire, explosion and health risks, as the biomass can be approximately 1,000 times more combustible than coal.

Operations at the facility will run 24/7 for 365 days per year, with the first phase capable of handling around 3mt per year, storing 100,000 tonnes in four new concrete silos with a total capacity of 168,000m^3.

The port has risen to the challenge of handling such large volumes of wood pellets by providing two continuous ship unloaders capable of handling 2,500 tonnes per hour to offload the ships. A total of 1.2km of covered conveyors will be installed to transfer the wood pellets, controlling the dust and isolating the hydroscopic pellets from the elements and harsh salt-laden atmosphere of an east coast UK port.

Problem solving

Once the wood pellets are stored in the silos, Immingham will face the same issues and risks of spontaneous combustion as a result of degradation and long-term residence. The Drax project addressed this problem by utilizing VibraFloor as the bulk reclaiming system.

Unlike other alternative reclaiming technologies, VibraFloor requires no routine maintenance, it has no major wearing or rotating parts, achieves 100% clearance of the stored product without generating dust or degrading the pellets and operates using very little energy.

The Port of Immingham.

The system works by creating a wave in the flexible surface plate of each module, instigated by a low power centrifugal vibrating motor. This undermines and collapses the leading edge of cohesive and free flowing material through a low pressure zone, creating a progressive avalanche of the stored material. The collapsed material is gently swept away by the wave action (much as the effects of erosion on coastal cliffs), constantly undermining any obstruction or bridged material held in the store.

And Drax and Immingham are not alone in adopting the Vibrafloor concept. Tilbury (before the project was cancelled) and other portside and power generation projects which are currently proliferating across Europe, each with similar ambitions to operate fully automated wood pellet and biomass storage facilities, have also included the system within their projects, handling both cohesive and free flowing materials.

From the outside, the Immingham project appeared to have many similarities with the larger and more advanced Drax facility, however the detail within has made it a very different project. Drax sits at the receiving end of the supply chain where the pellets will ultimately be ground to a fine powder and injected as a dust cloud into the combustors. Immingham on the other hand is located in the middle of the supply chain as a transfer facility, where gentle handling of the product from ship to railcar, to avoid pellet degradation and dust generation, is of major importance as penalties are included within the contract for any degradation incurred.

Drax opted to build four larger (63m diameter) concrete dome storage vessels with twin conveyor tunnels and a 'W' profile silo floor covered with VibraFloor reclaiming modules. They were designed to feed the 16 outlets positioned above the twin reclaiming conveyor tunnels, at an average rate of 2,600tph (tonnes per hour) per conveyor.

At IRFT, a different concept is being used, with more traditional slip formed concrete silos (36.5m diameter) constructed with a conical 'O' profile silo floor, feeding a single central outlet per silo. Both arrangements have their own advantages and disadvantages, although Graham Construction decided that discharging the silos via a single central outlet at an average rate of 2,000tph made controlling the flow easier and simpler to manage.

On a project of the size and complexity of Immingham, which was to be completed within a tight construction programme, security, safety and risk are at the forefront of everybody's minds. The project was designed to provide a safe and reliable system that will empty ships and refill eight trains per day destined for Drax, at a rate of 1,600tph. This obligation is not only for the 15-year term of the current contract, but also to provide a good return on investment over the 30 year design life of the project.

Fire

The substitution of sustainable biomass for fossil fuels is broadly acknowledged as a positive step. However, technical and safety issues associated with the combustion and storage of biomass still remain. Not the least of which is the risk of fire within a storage vessel as a result of hot particles or spontaneous combustion.

In common with many similar projects, Graham Construction has introduced a series of measures to detect or mitigate problems as swiftly as possible. One of the most effective measures is to introduce pressurized nitrogen to a wood pellet silo as a flame retardant. The distribution of nitrogen across the base of a silo to allow percolation through the product had been problematic. At IRFT, nitrogen is pumped in to the silo via pressurized pipes and valves located beneath perforated duct covers which lie between each segment of the silo floor, ensuring an even distribution of gas.

Projects such as the IRFT are, by their very nature, complex and risky. By including VibraFloor within the project, at least one of the key elements has been made simpler safer and more efficient. DCi

Equipment controls, drives & components

igus Chainflex cables now Germanischer Lloyd-certified

igus® was founded in Germany in a double garage, back in 1964. For the first 20 years, the company worked as a supplier of complex technical polymer components. However, in 1983 Frank Blase established reinforced plastic Energy Chain Systems® and injection moulded polymer bearings as two distinct product groups and set up a network of sales engineers. These seemingly unrelated products are linked together through the belief in making functionally advanced, yet affordable polymer components and assemblies.

Between 1985 and 2010, igus grew from 40 to more than 1,600 employees distributed between the head office in Germany and 26 subsidiary companies around the world. igus also has representative partners in more than 33 other countries. igus will continue to invest in expansion in the coming years, thanks to the opportunities for growth provided by modern materials.

The mission of igus is to use its innovative polymer materials to develop products that provide creative solutions and exceed our customers' expectations while delivering fast, accurate service.

New testing standards guarantee cable reliability in maritime applications

In order to utilize cables for motion control application aboard ships and on other offshore applications without expensive custom certified solutions, igus and the Germanischer Lloyd (GL) classification group have jointly developed a new test standard, and have certified a total of 328 Chainflex cables from igus, making them the first cables to receive this certification specifically for use in cable carriers, making the company a leader in the manufacturing industry with the most certifications for cables.

Due to the distinct increase in the level of automation aboard ships and other offshore applications in recent years, the industry has also experienced a notable growth in demand of Energy Chains and cable carriers. To supply suitable and reliable products for these specialized applications, igus had teamed up with GL to certify igus' line of Chainflex continuous-flex cables. The lengthy certification process took the companies three years, using a range of testing and specialized expertise from both organizations, resulting in the first series of GL certified cables for use offshore.

Development of test procedures

Typically, classification organizations such as GL issue certifications based on widely accepted international standards. In many cases, these refer to special characteristics in regards to specific material or component properties, such as combustion or flammability. However, these materials typically have no or limited suitability for use in continuous-motion applications. Since no uniform international test procedures for motion control cables in place, a new standard for testing needed to be found. The teams from igus and GL worked together to develop testing procedures to guarantee reliability of Chainflex cables offshore.

The two partners employed internal igus standards as a basis for guaranteeing the service life of cables in motion control applications. This information was supplemented by the typical standard tests of production samples performed by the GL certification group, which are based on international standards and years of testing. Customers now have the option to buy control, Bus, data, measurement, and power cables specifically for dynamic applications that comply with the requirements of commercial shipping regulatory agencies, all available from stock.

Hydraulic Brake Control (BC) – increased precision

Innovation and product development are natural elements of Indexator Rotator Systems's daily operations. The Hydraulic Brake Control (BC) has now been released as an additional development of Indexator's MPB-system. BC activates brake function only when it is beneficial, but in particular, brake function is disconnected when not needed.

There are now varieties available of Indexator's proven MPB brake links to forwarders and trucks with the function Hydraulic Brake Control (BC). BC is a hydraulic control of the brake function, which ensures activation only when needed. Brake function will be activated when the grapple is empty, but deactivated with loaded grapple to reduce brake torque interference in the weighing process.

"The greatest advantage of BC is that the powerful MPB brake can be combined with crane scales without risking the weighing precision due to high braking torque," says Sales and Marketing Manager, Erik Svensson.

The interface towards crane and grapple is the same as usual, even when mounting a rotator and swing dampener prepared for BC. Hence BC can be easily installed without the need for additional features or more hoses.

BC uses the same wear parts as other MPB swing dampers, and besides better conditions for weighing, BC also reduces wear on the brake pads and brake discs significantly.

Advantages of choosing Hydraulic Brake Control (BC) from Indexator Rotator Systems:

- Eliminates the influence of braking torque when weighing with the crane scale
- Reduces wear and lower maintenance costs
- Easy set up
- Additional features or more hoses is not required.

Indexator's Hydraulic Brake Control (BC) is a hydraulic control of the brake function, which ensures activation only when needed. Brake function will be activated when the grapple is empty, but deactivated when the grapple is loaded, to reduce brake torque interference in the weighing process.

Pintsch Bubenzer: braking systems for the bulk industry

Pintsch Bubenzer is a major force in the provision of service brakes, emergency braking systems, couplings, monitoring systems and more.

The company focuses on the design, production and service of high quality braking systems for both static and dynamic applications which involve the precise control of small to very large amounts of kinetic energy. The challenge is to control that energy in the most efficient, cost-effective way.

Pintsch Bubenzer is active in the sectors of port, shipbuilding and offshore engineering, mining, the steel industry, utilization of wind, mechanical engineering and construction of special vehicles. It is world-renowned in braking system design and manufacturing, with safety built into every product.

The company provides products for the following markets:

- cranes for material handling;
- ship & offshore;
- mining;
- steel industry; and
- wind power.

For the purposes of this article, the 'cranes for material handling', 'ship & offshore' and 'steel industry' markets are of the greatest interest.

Cranes for material handling

In the application segment of port engineering, Pintsch Bubenzer has worked very closely together with port operators and consultants, as well as crane manufacturers and chandlers internationally for many years. The global application know-how built up in this way secures continuous improvements in the quality-determining criteria for all participating parties and enables us to develop our products, technologies and services still further to the highest level in a manner suitable for real-work situations.

Ship & offshore

As a result of factors such as temperature variations, storms, contact with saltwater, flooding and downtimes, marine applications place the very highest qualitative demands on the braking systems used in respect of their design, the materials used, manufacturing, installation and surface protection. Thus corrosion resistance and absolute water resistance (up to IP 67) coupled at the same time with the ability for maintenance to be carried out in a simple manner — literally with what is on board — are among the mandatory criteria. Brakes and braking systems from Pintsch Bubenzer have been setting the standard on ships of different sizes and classes as well as on ocean giants since 1935 and are today the first selection for many well-known ship's chandlers and offshore-engineering manufacturers.

Steel industry

High ambient temperatures and dust-filled air are typical environmental conditions associated with the processing of steel. This environment places tough demands on the drive systems and brakes used in steel making facilities. Hot metal, semi-automated rolling mill and overhead loading cranes require the most reliable, maintenance-friendly braking systems available. The engineers and designers at Pintsch Bubenzer have decades of experience on such applications for the steel industry and know the problem zones and pitfalls of such applications back to front.

Pintsch Bubenzer products

Pintsch Bubenzer offers a wide range of products, including:

Anti-snag-systems: The mechanical anti-snag system separates the motor and gearing in a flash and prevents gear damage and tears in the steel structure of the units.
Couplings: Couplings serve for compensating relocation movements and for absorbing torque shocks that occur on starting and under load.
Storm brakes: The use of storm brakes prevents a crane from being moved by high winds or gusts.
Service brakes: Service brakes are installed at the (high-speed) gear input shaft to hold the load safely.
Emergency brakes: Emergency brakes are installed at the (high-speed) gear input shaft to hold the load safely.
Monitoring systems: Monitoring systems guarantee the 100% availability of the equipment and minimize maintenance expenses.

Business model

Pintsch Bubenzer supplies safety-relevant components for the avoidance of accidents and for the protection of human life.

The company therefore subscribes to the following guiding principles:

- its customers are at the centre of its activities;
- quality of an exacting standard and customer-oriented action are basic aspects of the company philosophy;
- the aim is to be the world leader in the development and production of industrial braking systems;
- on the basis of its long years of experience, Pintsch Bubenzer has a vast amount of know-how which it is constantly increasing in the interests of innovation;
- the company elaborates individual solutions to meet the requirements of its customers;
- through training and instructional measures, it is continuously investing in the expertise of its team which represents its capital for meeting the constantly changing requirements of the market;
- quality manufacturing demands manufacture to advanced technical standards;
- comprehensive service ensures that its customers around the world are satisfied with its offering;
- deliveries must be on time. Enquiries, quotes, complaints are to be dealt with in depth. Promises must always be kept;
- every member of the company contributes at his or her workplace to the attainment of quality targets and to the satisfaction of its customers. It is therefore essential that flawless work is carried out on every level of the company. If a risk in regard to quality is identified, every person is obliged to deal with it within his area of responsibility or to inform his superior;
- the quality of its products is also influenced by the quality of its suppliers. The attainment of its quality targets must therefore also be the declared aim of its suppliers;
- the attainment of quality targets is a major management task; and
- the quality of the work of the company's staff is of special importance; and
- its quality guidelines are binding.

SIBRE: serving today's dry bulk market

SIBRE – Siegerland Bremsen designs, manufactures and distributes industrial brake systems and drive components. The customers for its industrial brakes (e.g. hoist brakes) are consultants, OEMs and operators in heavy duty industries such as — but not limited to — ports, steel mills, mining and regenerative energies.

All SIBRE's products and processes are characterized by safety, reliability, sustainability and high quality certified according to ISO 9001. SIBRE has over 50 years of experience and expertise. It is able to provide high-level services, right from product development through to brake manufacturing, to commissioning. It offers worldwide service with specific maintenance agreements.

Its products include:

- brake technology for port equipment (plants for container and bulk handling);
- brake technology for the mining industry;
- brake technology for steel mills;
- brake technology for wind turbines; and
- drive components (crane wheels, buffers, drum couplings).

SIBRE's products are popular in, for example, steel mills. A few examples follow:

Service brakes designed for steel mills

Service or emergency stop brakes for container cranes, belt conveyors, bucket wheel excavators

The disc brake type USB 3 is a complete new development and forms a combination of spring and weight applied brakes.

These brakes are designed considering the specific demands of crane-, lifting- and material handling applications and is the consequent result of the continuous research and development performed by SIBRE.

Combined with another improvement of the SIBRE lining wear compensator the advantages allow to consider this USB 3 type brakes as the first real almost maintenance-free disc brakes. The new brake system has been created in two sizes and thus provides a solution for different brake tasks.

Safety brakes for steel mills

Caliper brakes type SHI are used as holding and emergency stop brake, installed on output shaft connected drive components such as the flange of hoist rope drums or the idler pulley of a conveyor belt.

They serve to protect the drive e.g. in case of gear box failure.

Drive components for steel mills

Wheels are machine-components with load bearing function. When selecting wheels and their material quality, a broad variety of options is available.

SIBRE's production portfolio includes separate wheels of diameter 315mm to 1,000mm, as well as complete wheel assemblies similar to DIN, as per customer drawing or as design proposal approved by the customer.

SIBRE standard wheels are made of forged cylinders of material 42CrMo4V.

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Making sense of real-time load measurement

The handling of dry bulk materials used to be a completely manual process, but it is now being increasingly automated in a drive to reduce both the costs and the risks of injury, while also increasing throughput and accuracy.

The demands of today's highly competitive commerce and modern industry are such that speed, accuracy and efficiency are required within every process. This includes the handling of dry bulk materials, such as grain, coal, aggregates, minerals and chemicals through every stage of their logistical journey from producer through processor and distributor to eventual end-user. Not surprisingly, major handling facilities are now highly computerized, and often have a control room with a bank of computers, which would not look out of place on the *USS Enterprise*. Their job can be summed up as collecting information from many, many different sources, collating it, and then calculating the optimum procedures for every stage of the overall process.

The computers represent a well-developed technology and their data processing abilities, while hugely impressive, are based on relatively simple logic algorithms. The technology developments that are driving the advancement of bulk handling are at the sensing end of the system, where the prevailing conditions of the moment are detected and converted into data signals for the computer to use.

"Sensors are the eyes and ears of the computerized system," says Mark Ingham of Sensor Technology Ltd, one of the companies at the forefront of developments. "They constantly monitor what is going on and feed real-time data to the computer." One of their latest products is a load sensor with a difference. Called LoadSense, it is wireless, so is ultra easy to deploy in situations like docks and grain banks where installing cables would be difficult – and maintaining them even harder!

LoadSense is online permanently and constantly sends real-time load value signals to the central computer or its own local computer or receiver for preliminary analysis. It can be used in all types of materials handling operations, but is particularly useful for measuring loads in augers and on conveyors, where materials are 'in flight', so the load varies constantly with time.

LoadSense can be thought of as a two-part system. First, is a strain gauge-based stainless steel tension type sensor, with a twin antenna transmitter built into it for transferring the load data the instance it is generated. The second part of LoadSense is the receiver, which can be either fixed in place or handheld. The receiver reads, displays and records the data and can pass it onto the central control system for integration with other data streams for analysis.

The receiver includes an in-built 32MBit memory, which can hold up to 280 hours of data, thus providing both a local control station and a backup databank for the wider system. It is also notable that each receiver can collect data from several nearby load sensors simultaneously, in a range of up to 100m.

Importantly, the LoadSense transmits using the worldwide licence-free frequency of 2.4GHz, so can be installed and operated freely without disrupting other radio-based equipment. In operation, data is transmitted at up to ten times a second, so LoadSense is constantly updating and providing real-time information so that operations can be optimized for best results.

The key benefits LoadSense brings to materials handling installations include: the simplicity of wireless installation, easy reconfiguration, its long battery life (which is complemented by easy recharging), and the dual antennas which represent just one part of the overall rugged design.

Technology transfer

In fact, Sensor Technology originally developed LoadSense for use with helicopters, as Ingham explains: "Helicopters often carry cargo in nets slung from cargo hooks on their underside, and it is important that the pilot knows its weight. A conventional load sensor in the hook could provide this data, but wiring it back to a readout in the cockpit would invalidate the craft's Certificate of Airworthiness, implying the need for expensive recertification. When we heard about this dilemma, we instantly realized that a wireless solution was the answer!"

Since its development LoadSense has been adopted by many other industries, too. For instance, in forestry tree harvesting is often best done by pulling the trees over with a large tractor — this uproots them, so that the whole tree is recovered and also the ground is left stump-free so is in better condition for reuse — a LoadSense on the pulling cable will provide the tractor driver with vital live information and also collect data on harvest volumes for commercial analysis. They have also proved popular in the fly towers of theatres, allowing scenery and backdrops to be raised and lowered quickly and safely, for materials monitoring in road laying and civil engineering, in food production and processing, etc.

Sensor Technology has also transferred another of its technologies, TorqSense into the world of dry bulk materials handling. Like LoadSense, TorqSense uses a radio frequency signal transfer technique, but its sensing head measures the rotary torque in a turning shaft. "Consider a screw conveyor or auger, both of which are driven by a rotating motor shaft," says Mark. "If this is rotating empty, it requires little power from its drive shaft. If it is half full, it requires rather more, and if it is completely full its needs a lot more. The same goes for speed – the faster, the more power consumed. Also, the denser the material being conveyed, the more power required. By constantly measuring the torque in the driveshaft, we can determine the volume and weight of material being conveyed."

Two new Brevini Power Transmission branches open in Mexico and Turkey

Brevini Power Transmission started the year 2014 in a positive way, thanks to the expansion of its business network. Two new branches open in Mexico and Turkey are bringing new clients from market sectors with high potential.

Brevini de Mexico works in synergy with the consolidated Brevini USA subsidiary and follows many important North American clients who have delocalized plants in Mexico. These savvy clients are very satisfied with Brevini's far-reaching presence on the market and the way it does business.

Brevini de Mexico is also developing the sugar market and mineral mining industry.

Brevini Reduktor in Istanbul is benefitting from the positive trend of the Turkish and Middle Eastern markets. In fact, despite the financial crisis, Turkey is becoming a real manufacturing powerhouse.

Brevini Reduktor works in several areas: the iron and steel industry, the water treatment sector, and in the shipbuilding industry.

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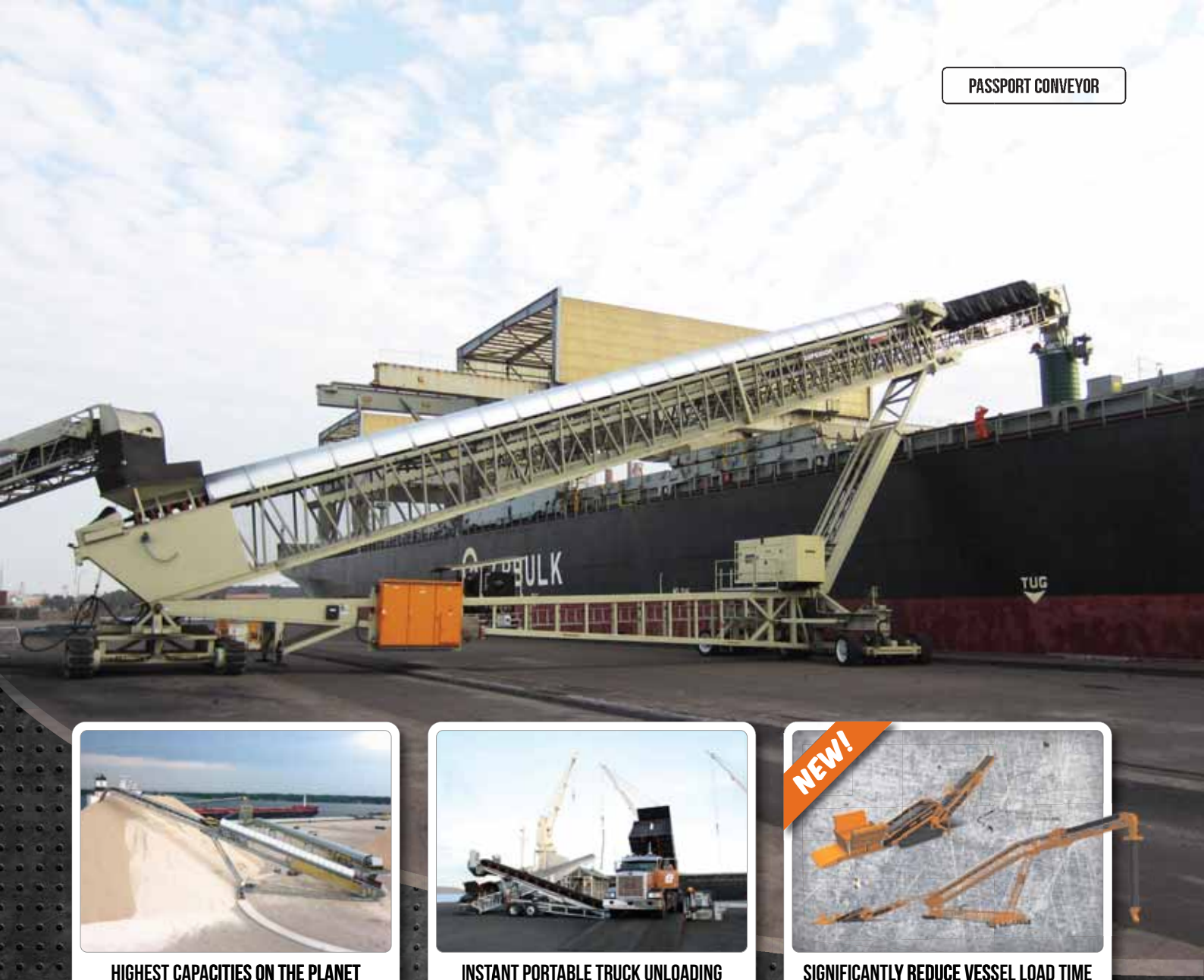

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Bega's flexible terminal

Klaipéda is situated on the eastern coast of the Baltic Sea. Its port has always been of great importance to Baltic seaborne trade, partly due its status as the foremost ice-free port in the Eastern Baltic. Today, Klaipéda is one of the busiest and most significant ports in the region, handling ever-increasing volumes of cargo.

Commercial advantages secured with Siwertell terminal solutions

Thanks to its Siwertell technology from Cargotec, the Lithuanian stevedoring company Bega has not only increased its cargo handling capacity, but can now offer its customers greater flexibility and access to commercial benefits

"At Cargotec we have many excellent references for Siwertell bulk terminal projects, ranging from the simple to the complex, for a wide range of dry bulk commodities and trade patterns," says Jörgen Ojeda, director for Siwertell mobile unloaders. "A recent contract for the stevedoring company Bega provides an excellent showcase for our expertise in addressing the call for a terminal solution offering a wide range of bulk handling options."

Bega, established in 1992, operates in the major Lithuanian port of Klaipéda, specializing in the handling and storage of liquid and dry bulk cargo, such as agricultural products and fertilizers. "Bega needed much greater flexibility for dealing with a range of dry agri-bulk commodities in a way that would allow importers and exporters to make the best commercial decisions with regard to their bulk assets as well as their seasonal requirements," Ojeda says.

Since the construction and commissioning of its new terminal, Bega now handles more than 4mt (million tonnes) of cargo each year, with dry fertilizers accounting for the greatest volumes; Bega's main clients are fertilizer producers from Russia, Belarus and Lithuania. In addition to dry and liquid fertilizers and agricultural products, the company also handles oil, crushed stone, cement and other dry cargoes.

Before its new terminal entered service in 2012, Bega had reached its operational limits for dry agribulk services. With no dedicated storage areas, it was impossible for Bega to store agricultural products at the port, so grain was exported through other Baltic facilities. Bega had little flexibility in the way it operated and needed a modern hub terminal to allow it to expand and offer first rate bulk handling and storage options to its customers.

Ojeda says the design and equipment specification are absolutely critical when a company such as Bega decides it needs to invest in a flexible, multi modal hub terminal.

"Our customers expect us to get it right first time and we do not disappoint them. They operate in competitive markets and when it comes to major investment in new projects, they need absolute certainty that the company they turn to for the design and supply of hardware will do the necessary research and planning. They want to be sure that the solution will be delivered within the specified timeframe and will work well, right from the start.

"Before breaking any ground we put in a tremendous amount of research and design work to ensure that we deliver a Siwertell terminal with the reliability and flexibility to meet the customer's requirements and maximize operational capabilities and efficiency"

Bega appreciated this uncompromising, rigorous approach; "We invited our good partner Siwertell to help us by designing

Automated warehouses at the heart of Bega's hub terminal

They say a picture is worth a thousand words, and that is certainly true when it comes to explaining the flexibility of Bega's new multi-modal agri-bulk hub terminal.

At the heart of the Siwertell solution there are two linked warehouses with a total floor area of 20,000m^2 and a storage capacity of 160,000m^3. A high degree of cargo segregation has been incorporated by dividing the warehouses into eight separate compartments.

The multi-modal design of the terminal means that bulk cargoes can arrive at the warehouses by road, rail or by sea. Dry agri-bulk cargo arriving at the terminal by rail wagons or trucks is directed to the covered loading and unloading station linked to the warehouses. Here, the agri-bulk material is tipped into four underground receiving hoppers. The four hoppers are served by two separate intake lines — each with a capacity of 500tph (tonnes per hour) — so two different types of cargo can be received simultaneously. The bulk material is conveyed to one of the eight compartments in the two warehouses by fully-automated overhead belt conveyors, according to a sequence set by the operator in the control room.

Loaded vessels discharge their cargoes at the new jetty. Bulk material arriving in this way is transferred, via a rail-mounted travelling hopper, to an underground conveying line with a capacity of 1,000tph. The cargo can be conveyed directly to the warehouses at full conveying capacity, where it is delivered to the storage compartments by overhead belt conveyors.

In all cases the automated transfer of material to the warehouse compartments is quiet and unobtrusive, with no spillage and minimal dust creation.

However, there are more conveying options for incoming cargoes. Part of a cargo arriving by ship can be conveyed to one of the warehouses while the remainder is sent simultaneously to the rail wagon and truck loading station. And the same type of cargo split is also available for cargo delivered to the road/rail station. Bega has the option of transferring cargo directly from the road/rail intake to a ship. This is a very useful capability for small quantities of materials that do not require intermediate storage, and it can also be very helpful if the warehouses are full.

Bega also has the capability to transfer cargo directly from a vessel being unloaded by its mobile harbour crane onward to the loader and to load another vessel.

As for the cargo stored in the warehouses; an individual parcel of cargo can be conveyed to the Siwertell shiploader on the jetty, or to the road/rail loading station, or it can be split between the two.

Payloaders working inside the warehouse feed the bulk material onto one of two underground conveyor systems with capacities of 1,200tph and 500tph. The larger system is used for cargo to be loaded onto ships; the smaller one is used for cargo heading for overhead buffer bins installed in the loading station for rail wagons and trucks. So outgoing cargo can be sent in both directions if required; generally speaking however, the flexibility provided by the two conveying systems means that two different cargoes can be moved at the same time.

Given this level of versatility, it is important to know exactly how much cargo is arriving; how much is in storage; and how much is being conveyed for onward transport. Weighbridges are installed at all the cargo intakes. Cargo being conveyed to the ship loader on the jetty is weighed by a hopper scale installed in a separate weighing tower. Ships of up to about 80,000dwt can be loaded at a rate of 1,200tph by the rail-mounted shiploader. A system of mobile conveyors serves the shiploader, allowing loading at any position along the length of the vessel. A travelling belt conveyor transfers material from the pier conveyors to the loader.

Jörgen Ojeda, director for Siwertell mobile unloaders.

and constructing our new facilities," says Bega's technical director, Laimonas Rimkus.

Adhering to the detailed requirements of the design brief, the new terminal has significantly improved Bega's capabilities for handling agricultural products; it can now provide the multi-modal export, import and transit flow of agricultural products that its customers need. It can also store significant amounts of bulk agricultural commodities in order to respond to favourable market conditions. As part of the infrastructure necessary to handle the massively increased cargo throughput, an additional Siwertell ship loader, capable of handling Panamax vessels at 1,200tph (tonnes per hour), was installed on a new jetty, where vessels can also be unloaded using a mobile harbour crane.

Rimkus explains the benefits that have flowed to Bega as a result of its major investment, beginning with the flexibility in grain export. "Now that we have the capacity to store agricultural products in our warehouses, the terminal will be in active use throughout the year, meeting the fluctuating market demands for grain, soybean meal and other feed derivatives."

"The powerful new Siwertell cargo handling equipment means we can load large vessels directly from rail wagons and from the warehouses." This means that rail wagons are used more efficiently; loaded wagons arriving can be discharged into the storage facility and then immediately loaded with an onward agricultural cargo.

The terminal's built-in functional flexibility allows Bega to provide all the functions of a hub port; it now has the capacity to re-distribute large quantities of bulk material from vessels such as post-Panamax type bulk carriers, not only by road and rail, but also by smaller vessels covering the Eastern Baltic region. Rimkus says customers appreciate the improved service and it saves them money.

Ojeda says Bega's terminal represents a fine example of the way in which Siwertell uses its unrivalled understanding of cargo flow solutions to deliver solutions that exactly meet customers' needs.

"Cargotec offers bespoke Siwertell solutions for all types of terminals; handling virtually any dry bulk material. We carry out our design work in full consultation with our customer to make sure we provide facilities that exactly meet their requirements; we also take into consideration the potential for future expansion and alterations that might become necessary if trading patterns should subsequently change.

"Terminal design incorporates engineering solutions and equipment such as ship loaders and unloaders across a wide span of capacities, storage systems, cargo weighing systems, loading and unloading stations for trucks and rail wagons, along with conveying systems employing belts and horizontal and vertical screw conveyors. The integrated systems are controlled automatically or semi-automatically, minimizing personnel requirements.

"Although our products are major mechanical structures, they are frequently more compact and lightweight than the alternatives available, and this can have knock-on benefits in terms of the load bearing requirements for new jetties, for example.

"It's something of a paradox, but to fully understand the benefits of our technology, particularly when it is incorporated in a terminal complex, you have to appreciate all the things that you don't see and hear," adds Ojeda.

"This is because our products and systems are quiet and not at all dramatic in their operation. Fully enclosed where necessary, there is little or no dust creation. Although there will normally be a lot going on, there will be very little to see or hear. The processes will be largely automated and controlled from a central control room, with the cargo generally travelling unobtrusively via overhead or subterranean conveyors, routed to storage areas, loading bays or to a shiploader for onward transport." DCi

Bega technical director, Laimonas Rimkus.





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Electrified advantages

Rick Zettler, Z-Comm

Electric material handlers offer several advantages, but there are several factors that must be taken into account.

Most companies in the scrap and recycling business look for ways to improve efficiencies, lower costs at the yard and get a leg-up on their nearby friendly competition. One area of growing interest for lowering costs and increasing efficiencies at the yard is switching from diesel-powered to electric material handlers. And why not? There are significant long-term financial gains to be had by switching to an electric material handler. With diesel prices averaging around $4.00 per gallon and the typical charge per kilowatt hour of electricity below $0.15, costs for powering an electric handler can be less than half that of a traditional diesel machine.

Because electric motors do away with the diesel engine and after-treatment systems, they are also much easier to maintain and will last longer than their diesel counterparts. "We estimate a 30,000-hour service life for an electric machine," says Steve Brezinski, Terex® Fuchs material handler product manager for Terex Construction Americas, "and the return on investment for an electric material handler can be as little as 18 months, if the power delivery infrastructure already exists."

With all this said, there are many factors that must be considered prior to switching to an electric material handler in order to get the most from the machine.

Site survey

Where should you start when looking into an electric material handler purchase? "It's the same as you would with any other new material handler purchase for the yard, the site survey," explains, Jay Young, scrap and recycling sales manager for Roadbuilders Machinery and Supply Co., Inc., a Terex Fuchs equipment distributor. "You need to conduct a comprehensive analysis of exactly what size machine and reach is necessary to meet production goals. The distributor or equipment manufacturer can help with this."

One top consideration is the location where the handler will operate. Popular site locations for electric handlers are indoors, feeding shredders and shears, and at the port, where high mobility isn't required. "Customers have two basic alternatives for an electric material handler," says Mike Myslicki, regional sales manager for Terex Fuchs equipment, "a stationary, fixed mounted machine or semi-mobile handler tethered to an electric cable, which limits the electric machine's roaming capabilities around the yard or port."

With mobility being limited, or non-existent, reach and capacity become more critical. An operation needs to consider how much of a reach will be required to minimize the number of times the material is handled. "Terex Fuchs offers a number of boom/stick configurations, with the MHL320 model offering a 31ft (9.5m) reach at the low end and the MHL385 handler offering a 75ft (22.9m) reach at the upper end," says Brezinski.

Working with the manufacturer, you can order an electric handler with cable length specified to your site's specific needs. "Power requirements vary by model, but as a rule of thumb the

higher the voltage, the smaller the diameter of cable, so the longer the cable lengths," says Thomas Berners, director of product management and Application Center for Terex Fuchs. "We have equipped a handler with 787ft [240m] of cable for a customer in South Korea."

Finally, as part of the survey, you will want to do a cost-benefit analysis of the total investment to get the site ready to power an electric handler. "If a site has a shredder, then it will already have the power source on site," comments Young. However, if the power infrastructure does not exist at the yard, then this will be an additional cost to the company.

Mounting advantages

Once the site survey is complete and the right locations are selected for the new material handlers, then you are ready to reap some significant advantages of the alternate-fuel machines. First and foremost, exhaust emissions are eliminated. Eliminating the particulate emissions of the diesel engine is better for the environment, and it makes the operation friendlier to nearby neighbours.

No-emissions operation is perfect for indoor recycling centres and transfer stations. It creates a healthier work environment for employees, and it can help the operation by meeting workplace health and safety legislation.

Once the main electric motor is started, the handler is always ready for work. There is no downtime waiting for the machine to be fuelled, so there is better uptime availability. Electric handlers more efficiently use the available power than diesel engines. "Whereas diesel engines achieve approximately 30–40% available power utilization," explains Berners, "electric motors deliver up to 90% efficiency." Additionally, there is no regeneration downtime, common to some Tier 4 engine designs.

Replacement of the diesel engine, cooling system and exhaust after treatment components with electric motors greatly simplifies maintenance needs for the handler and adds to machine uptime. Engine oil changes and filter replacements are no longer necessary. "For the most part, you just maintain the motor bearings with an electric handler. That's it," says Brezinski.

Low-vibration electro engines are much easier on machine components, pumps and the clutch, which helps to significantly

extend the machine's service life. "Customers operating in scrap and recycling applications will typically run conventional diesel-powered machines for up to 15,000 hours before they will replace the handler or rebuild/replace major components," mentions Young. "However, electric handlers will typically offer twice the service life of diesel machines, which significantly lowers long-term operating costs."

Finally, don't be afraid to work electric material handlers in the elements. They are designed to work in the same weather conditions — heat, rain, cold and snow — just like diesel models. Additionally, Terex Fuchs electric handlers come standard with a main power switch disconnect to safely service the machine.

Take into account

While there are several significant advantages associated with electric material handlers, Young cautions operations not to think that they can replace all the diesel machines at the yard. "Scrap and recycling operations typically run a mix of diesel and electric machines at the yard," he says. "You will always need the mobility of a diesel unit with some of your handlers."

When looking at handler design, Berners offers this with regard to the electric motors. "Consider a handler that dedicates motors to separate functions rather than one larger electric motor," he comments. "The power torque curve to start a smaller engine is lower, which reduces the chance for blowing fuses at start-up. Additionally, it is more efficient when you have a larger main motor and then smaller separate motors dedicated to pilot steering and the air conditioning unit."

Also, look for an electric machine that shares components and parts with the manufacturer's line of standard diesel units versus purchasing a specially designed electric handler design. This will help to ensure quick parts availability from your local distributor and allow your operation to stock fewer parts, since many of the same parts will work for both diesel and electric handlers. "Besides parts commonality, electric handlers can also retain many of the same features as their diesel counterparts and don't require a steep learning curve for the operator," says Brezinski. "Terex Fuchs electric handlers retain a very high degree of series component commonality with their diesel counterparts."

While similar in design to diesel machines, expect to pay a slight premium for a comparable electric handler model. Myslicki estimates about a 10–15% premium on average. "Depending on the configuration, it could be as low as 5–8%, but a pedestal machine will typically run about 10% higher and a mobile unit will be closer to 15% more," he says.

Electric material handlers are not standard production machines, so expect a longer lead time — about four to six months, depending on configuration — than with standard production diesel models. Terex Fuchs custom-builds its electric material handler in its advanced Application Center. "We can also add components like power packs for mobilizing the machines off-grid, pedestal options to raise the operator's line of sight and custom-length power cables to the handler," says Berners. "It's important that you work closely with your distributor and manufacturer to ensure the machine is equipped exactly the way you want it to boost productivity and efficiency at the yard or port."

Finally, there is a cost associated with the electrical infrastructure needed to power the handlers, which can have motors with as high as 335hp (250kW) ratings. Electricity will be the lifeblood of these machines, so make sure the station delivers consistent, reliable power. "If there's a power outage, then the electric handler is not moving material," says Young. "As I mentioned, if the operation already has a shredder, the electrical infrastructure already exists, and it makes the decision much easier to go electric."

While sorting through many of the same considerations for purchasing the right diesel material handler for an application, selecting the right size, reach and model of electrical material handler takes some time and special scrutiny. Once an operation works through the cost-benefit analysis and all the necessary considerations with the equipment distributor and manufacturer, the electric material handler model selected can help to control long-term operating costs and increase efficiencies. DCi

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Tower NIV 200tph/132kW delivered in Antwerp (Belgium) in 2014.

Louise Dodds-Ely

VIGAN towers: an ideal way to unload agribulk from barges

Inland water transport is one of the oldest and most sustainable modes of bulk product transportation. The transport of bulk product on rivers and/or along the coasts in small size vessels such as barges is recognized as an economical and environmental alternative to road transportation.

It allows more efficient use of resources and energy: a medium-sized barge of 1,500 tonnes keeps 60 trucks of 25 tonnes off busy roads!

Cheaper transport costs, less fuel consumption, low noise pollution, more security, easier unloading due to the holding capacity of barges — the advantages of water transportation are numerous.

Pneumatic unloaders have been used for many years for the transport of agribulks in barges: the various characteristics and advantages have been widely accepted by the decision makers concerned by the logistic of these products.

Efficiency for river barges

'Tower'-type VIGAN pneumatic unloaders are particularly well suited for the unloading of coastal vessels and/or barges with a width (beam) lower than about 15-20 metres. A boom up to 17–18 metres is usually sufficient to reach most of the hold openings and to ensure efficient unloading operations. Very similar to VIGAN NIV unloaders, towers can reach capacities up to 600tph (metric tonnes) per hour.

In comparison with traditional methods such as grabs or other mechanical devices such as excavators or others known as marine legs (usually chain type), pneumatic unloaders have been largely accepted by most operators because they offer several major advantages:

- **quicker cleaning:** with the capacity to empty the ship's hold entirely and quickly. This means a high unloading rate at the beginning of the hold but also during the whole and time

consuming final cleaning. Pneumatic unloaders behave as vacuum cleaners: the equipment will efficiently suck the latest product particles down to the hold bottom. Thanks to the telescopic characteristics of their pipes and the rotating capability of the boom supporting the conveying line, the suction nozzle is able to reach the most unreachable corners of the hold. This represents significant savings for the operators: time and money.

- **energy consumption:** reduced due to the set-up of technological innovations like the frequency inverters (variators): actually around 0,6 KWT/h.
- **environmental concerns:** these are a determining factor in favour of pneumatic unloaders. Transport by barge quite often takes place near urban areas where dust levels must be controlled. Pneumatic unloaders are a totally enclosed system: a 'jet pulse' filter (high pressure type and with automatic self-cleaning) ensures minimal dust emission (less than 10 micrograms per cubic metre).
- **manpower and safety:** a single worker is able to operate 100% of the unloading operation of a barge. It is quite common that this operator not only manages all the unloading equipment's main functions thanks to a remote control, but he also takes care alone of all the final clean-up by manually brushing the products around the suction nozzle and/or with the help of an auxiliary skid steer loader. Slow displacement of the suction pipes and intake nozzle are without any doubt safer than in and out movements of grabs.

Suitable for all free-flowing products, pneumatic VIGAN towers can also handle products like soya bean meal, with the use of a cutting nozzle. The cutting nozzle consists of a central suction pipe around which three screws rotate and break the non-free-flowing soya meal. The complete assembly is mounted on a slewing ring with an electrically controlled slewing mechanism, in order to dig a wide trench.

A new tower for Dossche (Belgium)

VIGAN has just installed a new tower with a capacity of 200tph at Dossche Mills in Antwerp (Belgium). Due to the dock that has recently been enlarged, the tower enables the discharge of wheat from barges and coasters up to 4,000dwt, to silos. The first unloading took place in March 2014.

The tower is built on a fixed structure. It is equipped with a main electrical motor of 132kW/400V/50Hz. The turbo blower, with direct drive, is controlled by a frequency inverter that reduces power consumption by around 25% in comparison with traditional systems.

The 17.5-metre boom is completely hot-dipped galvanized and is equipped with a gangway all along it for easier maintenance.

The piping is made from hard materials like TRITEN (hardness over 700HB) and HARDOX 450 (hardness of 450HB). Also, the elbow is in wear-resistant Ni-Hard 4 cast iron. One of VIGAN's clients reports that it has already handled over 7 million tonnes with the same elbow, which is still in operation!

VIGAN's range of tower type machines can also be on gantries, on rails or on rubber wheels, according to specific customer requirements.

A bright future for VIGAN towers

Since the beginning of 2014, VIGAN has received several enquiries for the tower-type machines. These are currently under manufacturing in Nivelles (Belgium), namely for customers based in France (tower 400tph/320kW) and in the Philippines (tower 250tph/160kW).

Other tower projects are also in the pipeline in various continents.

VIGAN cutting nozzle suctioning soya bean meal.

Telestack's mobile truck unloaders for barge and rail wagon loading/unloading

Telestack Limited continues to excel in providing innovative mobile bulk material handling systems to its worldwide customer base. This has been emphasized in the manufacturing and development of fully mobile systems for loading barges and rail wagons directly from trucks, wheel loader and grabs. Telestack's mobile unloaders are designed for a range of applications, with operators greatly benefiting from eliminating the double handling of the bulk material by unloading directly from trucks, wheel loaders and grabs to barges/rail wagons. These mobile solutions offer the performance both in loading rates and environmental qualities of a fixed installation with the added bonus of greater flexibility and mobility on existing berths/ rail yards, to eliminate the need for dedicated port/berth/yard infrastructure or civil requirements.

Fig 1: Mobile truck unloader (track mounted) loading barge directly from trucks and wheel loaders – 21 metre (70ft) radial boom conveyor, with an integrated gen-set. All electric driven.

Telestack's complete range of truck unloaders

The range of Telestack truck unloaders is extensive, taking into consideration varying truck sizes, payloads, materials, cycle times, unloading rates and so forth. All Telestack's products are customized to the needs of the particular client and operation. As with all Telestack products, the mobility and flexibility of the units are the key features. The advantages of mobile systems are being recognized more and more in the industry, with port operators identifying the flexible mobile system as a viable option replacing expensive fixed installations which require civil work, planning permission and (in some cases) an ineffective loading procedure for both barges and rail wagons. The advantage of moving the mobile truck unloader off the site when it is not required is of great importance, especially when the port is not owned by the operator or it is a multi-cargo berth.

Telestack's mobile truck unloaders offer a range of mobility options for each individual requirement. The tracked mounted option gives the operator unrivalled flexibility when moving around site, as this unit is completely independent of all other systems. There is a diesel engine to drive all functions, with an optional dual-power upgrade available which means the unit can be tracked into position, at which point the three-phase is plugged in and used to power the conveyor belts. This limits the diesel consumption of the units. There are also options for all electric-driven units for all the functions, complete with integrated gen-set for a complete mobile unit. There is an option of rubber track pads on the tracks and wheeled options available which ensures the concrete/asphalt surfaces are not damaged from the tracks. The greater mobility of these units also ensures they can be used in other applications within stockyards, mines and quarries if required, important for possible re-sale value if contracts are finished. There are wheeled options available for a more basic unit which allow the operator or shipper to tow the unit around the site into each position. Telestack can also offer static versions, depending on the specific needs of the client.

Fig 2: Mobile truck unloader loading a barge with dust enclosures, dust extraction and a telescopic discharge chute.

Typically, the range of truck unloaders can handle trucks up to 50-tonne payload (tipping or dump truck). The large hopper capacity increases cycle times which increases production rates. As there is such a wide range of trucks available on the market, Telestack can custom-design the hopper area to facilitate the most effective and efficient unloading area, including extended hopper sides, folding sides, flared design, dual access (increased cycle times), integrated fall break and many more. This ensures that the flow rate of each specific material and truck can be defined and taken into consideration during the design procedure. Also, the unloaders can be easily fed from wheel loaders and grab cranes for added flexibility. When handling dry bulk material, the dust suppression measures installed on the units ensure minimal dust emissions when unloading. As seen in figure two, the dust covers, dust extraction and telescopic discharge chute minimize dust emissions in the unloading area and discharge point to ensure a dust free loading procedure.

Fig 3: TU mobile truck unloader loading barges directly from trucks in USA.

All of the truck unloaders incorporate a heavy duty apron chain belt feeder, which ensures the surge of material discharging from the truck can be transferred and controlled onto the incline

conveyor and barge/rail wagon or auxiliary equipment. Unlike other feeder conveyors which use rollers which would slip under the intense load in the hopper, the chain and sprocket driven belt, ensures there is no slippage and stalling of the feeder conveyor.

Mobile truck unloaders as part of mobile system

Fig 4: Dual access mobile truck unloader feeding radial telescopic shiploader to eliminate the double handling of material on the quayside – direct truck to ship loading procedure.

Telestack's range of truck unloaders can also be used with the company's range of radial telescopic ship/barge loading conveyors. The combination of the mobile truck unloader and the mobile radial telescopic shiploaders offer the 'perfect' loading operation directly from trucks to ship/barge. As seen in figures four and five, the radial telescopic technology offers unrivalled trimming capabilities without moving the truck unloading equipment.

Fig 5: Mobile truck unloader feeding a radial Telescopic for stockpiling material in a warehouse in ship-unloading application directly from vessel (multiple function equipment).

Rail wagon loading — the mobile system for continuous loading

The flexibility and mobility of the range of truck unloaders and hopper feeders allow for different perspective for loading rail wagons. For continuous loading directly from trucks, the mobile truck unloaders ensure an efficient loading method while completely filling the wagons without moving the train. The unit includes an operators control cabin built into the unit which allows of the functions of the unit to be operated easily during loading. The unit will move 'in-line' with the rail wagon and will load continuously (without stopping) until the entire wagon is filled. This ensures there is no downtime when loading the wagon, the conveyor will only stop when it transfers to the next wagon to start the process once again. The unit is also fitted with an integrated belt weighing system with a large display panel which indicates the amount of material over the system, so the amount of material in each wagon can be easily controlled and monitored. This ensures the operator cannot be liable for any 'over-loading' of the rail wagons, which can be a problem, especially when wagon loading directly from wheel loaders.

The radial boom conveyor of the TU 515R mobile truck unloader allows for the wagons to be loaded easily while moving the truck unloader parallel to the rail line — see figures six and seven. The radial feature enhances flexibility for the operator and allows for radial travel 60° left/right, so the unit can be used in range of applications, including bargeloading, stockpiling, feeding other Telestack equipment and many more. This unit can also be easily fed from wheel loaders, which allows for direct feeding from stockpiles on site, especially when trucks are not available or in between the truck cycle time for increased production capacities.

Fig 6.

Fig 7.

TU 515R mobile radial truck unloader loading rail wagons directly from trucks.

When loading rail wagons directly from wheel loaders and conveyors, Telestack also offers a range of mobile hoppers and radial conveyors to allow the operator to feed and load the wagon at a controlled and safe manner. As shown in figures eight and nine, the tracked mounted mobile hopper can track parallel to the rail line while loading directly into the centre of the rail

Fig 8: Tracked hopper can move parallel travel and load each rail wagon easily into the centre line for a very flexible and mobile system.

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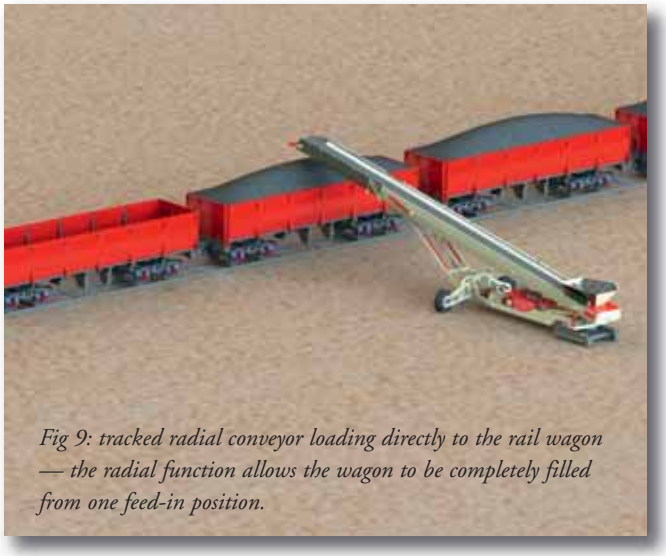

Fig 9: tracked radial conveyor loading directly to the rail wagon — the radial function allows the wagon to be completely filled from one feed-in position.

wagon. This is a much safer way to load the rail wagons, as typically the wagons can be loaded with wheel loaders, however, this can lead to damage to the wagons and possible accidents. The radial conveyor can 'trim' all areas of the wagon easily from one single feed-in position, eliminating down-time and ensuring accurate loading.

Fig 10: Rail Unloading hopper 'belly dump' feeding link conveyor to radial telescopic stacker in rail-yard.

Telestack also offers a range of rail-wagon unloading systems, which provide another option for the wide customer base.

These unloading systems take into account a range of differing wagon unloading methods used in the industry, including, side tipping, underground unloading, 'belly' dump type and many more. Using its experience within this industry, Telestack customizes these systems accordingly to meet the needs of each application.

Telestack units fully built and tested in factory before dispatch

Telestack products are fully designed and manufactured in the company's state-of-the-art manufacturing facility in UK. All products are custom-designed to each specific application — material, loading rate and so forth. The equipment is fully built and tested in the factory before dispatch, with extensive testing of all operations, including electrics, hydraulics, functions and more before being packed for transport (either containers or ro/ro). This ensures high quality design and manufacturing

Fig 11: rail unloading 'single conveyor' feeding directly to trucks.

throughout the process and ensures there are no issues with the equipment on site. In terms of installation and commissioning, all units are bolted together (NO welding), minimal hydraulics and electric (plug and socket system), which ensures the units are operational within one week or less.

Blug grabs remain popular in moving bulk by rail and barge

Image 1.

Since 1965, Blug's product portfolio has evolved, giving rise to successful quality-based solutions for different applications and environments. The Credeblug company's target is to offer the highest lifecycle value, heavy-duty grabs for all type of crane and material requirements.

Blug products are present in 52 countries and there are more than 3,000 Blug grabs working around the world. "The year 2014 presents record figures for our grab business," says Asier Susaeta, the general manager of the company. "Our domestic market's activity has been growing since the end of 2013, while our export figures still represent 70% of our revenue," he says. "Port activity is one of our key sectors and we are really conscious about the market's new demands concerning product efficiency and evolution. In this sense, our grab features have been completely revised and adapted to each specific application: rail and barge material transportation is one of them," he concludes.

Grab bulk handling represents an efficient alternative for the loading and unloading stages of transporting bulk product by rail

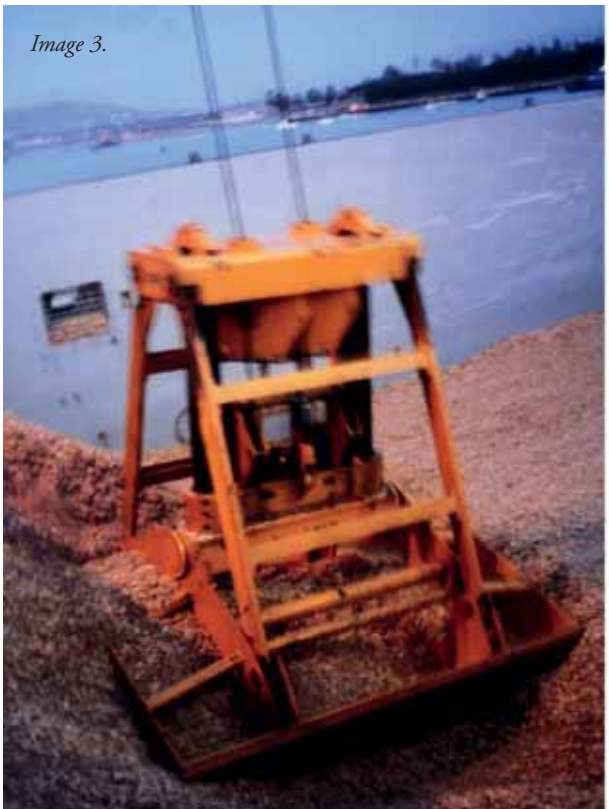

Image 3.

and barge. As with any other heavy-duty process, the design for these kind of applications has to be adapted so that they can be achieved. Blug PR8 electro-hydraulic rectangular grabs (see image 1) are specially dimensioned to achieve good loading ratios and perfect integration with the dimensions of rail wagons. In addition to electro-hydraulic control devices, in the last few years the market demand has shown a clear tendency towards material handling automation. Blug grabs offer a wide range of automation devices for operational parameters control and transmission to improve handling cycle safety and crane operator costs.

Depending on the shape, density and moisture of the material, and the transportation method, the grab family should be adapted to define the most appropriate reference for each project. Grab operational flexibility, in terms of different material handling and movement alternatives, can cover port cargo requirements' evolution for different scenarios. For bulk material handling, the design of clamshell grabs design is the most suitable alternative. In particular, the CV2 electro-hydraulic model presents a good balance between working speed vs. loading capacity (see image 2).

The Blug grab company has wide experience in barge loading and unloading. Its solutions for that market offer the possibility to customize the design of each grab (orange peel or clamshell type) for each crane technology. For Credeblug, the grab business is conceived as a global activity. Its expertise in engineering and customer-focused developments are without any limitation due to grab technology or working conditions. That's why the Blug product range one of the most complete grab solutions on the market, offering a quality rope-operated, hydraulic and electro-hydraulic or motor grab catalogue. Blug solutions go from single-rope-operated radio-controlled and automatic grabs, to four-rope or electro-hydraulic high volume grabs that fit any crane, material and production requirements (see image 3). Depending on the crane available for each case, different grab motion could be implemented. To the electro-hydraulic technology previously mentioned, rope-operated or hydraulic motion could be used for different capacity and/or material. The combination of all these factors is capital to obtain a fast return of investment also based on:

- grab productivity (tonnes per hour) vs. operational costs;
- purchase investment vs. maintenance costs;
- modularity and operational flexibility
- operating times (opening-closing-transport movements); and
- material loss during transportation movement.

Image 2.

In terms of barge material handling, the Blug grab range offers a high-productivity and operational flexibility balance which represents a lower investment and more flexible solution in comparison with continuous unloading systems. One of the most common materials transported in barges, which is also a major commodity in many ports, is coal. For this kind of material, as for any others — like biomass or cereals that can produce high-levels of dust during their transportation — it is important to take environmental protection into consideration. Protecting the environment is one of the key aspects during the design process, and it is probably the main disadvantage for crane-grab type bulk unloading versus continuous ship unloading systems. That's why grab's special valves sealing and closing structure, together with shape optimization, complement Blug's dust-control features by preventing material degradation during continuous handling cycles. This makes them a highly competitive option for these kind of applications.

E-Crane: ideal solution for barge handling

With rising energy costs and an increasing focus on energy efficiency, transportation by barge is becoming a popular solution to move bulk materials. This method of transportation is one of the most cost-effective ways to move bulk materials from production point to the market.

E-Crane is ideal for barge unloading and can unload barges up to 2,000tph (tonnes per hour). E-Cranes are often used to unload barges in 'mission critical' applications where the E-Crane is the only means for unloading. Along with the material handling equipment, E-Crane also offers a turnkey solution for barge handling.

E-Crane's barge-haul system for moving loaded barges consists of two opposed winches — one forward and one trailing. The winches work in tandem with a continuous steel cable that includes two master links with a hitch rope for tying to the material barge. The two winches are mounted to the dock on either side of the E-Crane.

In some cases, the infrastructure, environment, or other issues at the site do not favour a permanent installation. In this situation, the complete material and barge handling package can be mounted on a floating material handling platform. The floating material handling platform is an ideal solution when there is little or no existing infrastructure or if the flexibility of a floating, moveable system is required. In the case of a barge mounted E-Crane, the barge-haul winches are sometimes located alongside the E-Crane on the barge deck.

As a part of a turnkey project, the barge-haul system can be incorporated into the E-Crane controls, so that the barge-haul can be controlled from inside of the E-Crane operator's cab. A foot pedal inside the E-Crane cab allows for hands-free barge shifting while the E-Crane operator simultaneously unloads the barge.

About the equipment

Specifically designed for barge unloading, E-Crane is an established and trusted solution in the bulk handling industry, having proven itself at ports and terminals, offering complete solutions that ensure high efficiency and productivity. E-Cranes provide longer outreach ranges than typical material handlers, from 24.8 to 47.8 metres (82 to 157 feet). This outreach allows for unloading any type of barge or ship with minimum cleanup.

E-Crane duty cycle capacity ranges from 5 to 50 metric tonnes (5.5 to 55 US tons).

The 'E' in E-Crane stands for Equilibrium. The E-Crane design is based on an ingenious parallelogram style boom that provides a direct mechanical connection between the counterweight and the load. This unique four-bar mechanism system ensures that the E-Crane remains in near perfect balance throughout its working range. Compared to conventional cranes that require as much as 80% of their available energy just to move the boom, stick, and grab, the E-Crane makes gravity work for you instead of against you, reducing horsepower requirements and power consumption by up to 50% and significantly reducing maintenance and operating costs. Flow-on-demand hydraulics also play a part in lowering power consumption, along with the modular design. This simple, balanced design with modular construction allows for off-the-shelf components for longer service life, but also enables custom solutions.

About E-Crane

E-Crane Worldwide is a modern, state-of-the-art engineering and heavy equipment construction company, based in Adegem, Belgium and with subsidiary companies for sales management, technical support and service in The Netherlands (E-Crane International Europe) and Ohio, USA (E-Crane International USA).

E-Crane Worldwide develops turnkey material handling solutions with engineering services, equipment manufacturing, erection, operator/maintenance training and custom tailored on-going service programmes for its clients.

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Richmond Engineering Works teams up with Conductix-Wampfler to supply rail car dumper positioner system for an Atlantic Coast Terminal

Moving bulk materials — coal, wood chips, grain, aggregate, or biomass — is being done more often by gondola cars rather than hopper cars. Hopper cars sacrifice space due to the bottom chutes and have a high centre of gravity. Hopper dump doors can sometimes leak materials onto the tracks. Gondolas, however, must be picked up and dumped. An increasingly popular method of doing this is the 'rotary dumper', which secures the car and turns it completely to dump the contents.

Using a locomotive to position cars into the dumper is slow, inefficient, and inaccurate. A better option is to employ an indexing positioner to move cars into the dumper. Railcar positioners also help reduce or eliminate demurrage fees commonly associated with inefficient or slow unloading methods at export terminals, trans-load facilities, power plants and manufacturing facilities.

One of the terminals on the Atlantic seaboard recently chose a rack-and-pinion style railcar positioner, designed and supplied by Richmond Engineering Works (Pittsburgh, PA). Ken Hunt, engineer with REW, explained that, "the two REW rack-and-pinion-style railcar positioners are believed to be the largest of their kind in North America. They can handle up to 160 car trains with individual cars weighing up to 286 kip (286,000 pounds-force) for a total positioning capacity of nearly 45.8 billion pounds per train. The positioner can index the entire train as a coupled unit into the rotary car dumper or it can handle smaller strings of rail cars."

Hunt added that, "the drive system for this particular project consists of eight 150-HP motors and gearbox assemblies controlled by off-board variable frequency drives (VFDs). One of the many challenges of this project was connecting the motors and other on-board equipment to the off-board controls and VFD's as the positioner travels along a 400ft runway. It took several consultations with Conductix-Wampfler to specify the right festoon system for the job.

Richmond Engineering worked closely with Tim James, engineered product specialist at Conductix-Wampfler, to arrive at a cable festoon to carry the shielded VFD power cables as well as the control and communication information to the control system. The entire positioner operation is controlled from a remotely located operator house with sensors providing the needed feedback to the operators.

James noted that, "the massive festoon system was factory preassembled on a 53ft steel shipping frame. We believe it to be the largest preassembly we have done to date." James went on to say, "the cable package consists of eight of 4/ 0 AWG 3 conductor VFD construction power cables one 2/0 AWG, 3 conductor power cable, one 1 AWG, one conductor grounding cable, one 12 AWG, 12 conductor power control cable, one 6x62.5/125 fibre optic cable, and eight 16 AWG, three conductor twisted and shielded pair control/signal cable. Active travel is

340ft, with a loop depth of 10.50ft, and cable weight per loop of 650 pounds."

The Conductix-Wampfler festoon relies on its heavy duty 360 Series festoon trolleys each with a large two tier support saddle arrangement, 4.00" diameter steel main rollers with precision sealed bearings, 2.50" diameter side guide rollers, and 2.00" diameter anti-lift rollers. The trolleys are hot dipped galvanized with all stainless steel fasteners for corrosion protection.

James went on to say that, "VFD AC motors operate at high frequency switching speeds which leads to electro-magnetic interference (EMI). EMI can radiate out and interfere with electrical equipment. The VFD construction power cables have the proper shielding to reduce the effects of (EMI), reflected standing waves, voltage spikes and Corona issues. This type of power cable is becoming more common with today's VFD motors."

With the success of this project, Richmond Engineering Works and Conductix-Wampfler expect to team up again for future rail car positioner projects.

Keeping a lid on it: railcar covers protect cargo and the environment

Ecofab designs, manufactures and leases composite railcar covers for a variety of open-top railcars both hopper cars and gondola cars. The Ecofab Cover System, however, is much more than covers. The company is a full service contractor protecting bulk commodities in transit. It offers a complete package including finance, design, construction, service and maintenance, safety and fleet management. Its system offers a zero payload loss capability as well as providing 100% protection from environmental realities like rain and snow. As a result, it has seen a spike in interest from customers which are trying to be good corporate citizens as well as those trying to meet new stiffer environmental requirements.

Most of Ecofab's customers are mining related, shipping minerals, but its covers are also used to cover grain, fertilizer, sugar, wood chips, and hazardous waste materials.

Product innovation has always played an important role at Ecofab. New products are designed built and tested using latest technologies and state-of-the-art materials in order to provide equipment that is lightweight yet strong enough to provide safe and efficient service. Ecofab's R&D department has developed several unique railcar cover products in order meet specific customer requirements.

Coal railcars used in most countries in the world are open top railcars. Some locations have adopted the use of chemical surfactants (a mix of chemicals and water) as a means of reducing coal dust from loaded coal trains. The effectiveness of the chemical surfactants is dependent on a number of factors like: mixing rates, water quality, application, type of coal, coal loading, weather, length of journey etc. These chemical surfactants do not stop coal dust losses, they only reduce the dusting from loaded coal trains. Ecofab railcar covers however are unaffected by any of these factors and they don't just reduce this dust, they stop the coal dust blowing from the tops of coal railcars on both loaded and empty coal trains. Ecofab has now designed and built a new patented railcar cover system suitable for high volume operations. This new design enables both gondola and hopper railcars to be loaded and unloaded without adding any delays to the train. The system is also completely compatible with existing rotary dumpers. Final testing is currently being undertaken before the covers go into trial service.

Ecofab has worked with NASA and major universities in Australia and Canada investigating railcar cover aerodynamics. This research has led to Ecofab's latest project in the United States, where planning is proceeding to trial covering US coal trains in the western United States. This technology has been designed to operate in parallel with existing train loading and unloading operations. These railcar covers are designed for extreme weather conditions, +40° Celsius to –40° Celsius, strong winds and heavy snow. The covers are relatively lightweight and can be retrofitted to existing or new coal railcars, thus providing an environmentally friendly long-term solution to dust losses from open topped coal trains.

These covers will safely and reliably provide 100% commodity containment and protection from the elements. As a bonus, the covers provide considerable aerodynamic drag reduction with potential fuel savings up to 20% dependent upon terrain travelled. The lion's share of fuel savings is on empty cars where the aerodynamic drag is more significant. On level track, a loaded freight train uses approximately the same amount of fuel as an empty train. The reason for this apparent abnormality is aerodynamic drag. An empty coal train creates lots of turbulence as it is run along the railway track. The wind circulates in each of the empty wagons, significantly increasing aerodynamic drag and therefore requiring extra fuel to haul the train. As fuel costs continue to increase, improving train aerodynamics will become more of a focus for rail operators.

Airborne particulate dusting from railcars can range anywhere from zero to high risk depending on the material. This dusting occurs from both loaded and empty trains. In fact, it is often quoted that there is more dusting from empty trains than loaded trains. Ecofab covers provide 100% containment of bulk commodities from both loaded and empty railcars, leading to elimination of dust losses from open top railcars into the environment. The covers also eliminate the chance of rain or snow compromising or degrading the onboard commodity, which leads to delays in unloading and improved efficiencies with decreased back loading.

With over 40 years' experience protecting bulk materials in transit, and with fleets currently logging millions of covered railcar miles every month, the Ecofab Railcar Cover System has a proven record of reliability and safety. Ecofab currently has operations in Australia, Canada, United States and South America and shortly in Sub Saharan Africa, Ecofab is a world leader in railcar cover technology.

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FAMAK advanced technologies in service of Slovakian transshipment complex

FAMAK SA has completed the assembly of automated transshipment equipment for a transshipment complex in Slovakia, with the provision of a wagon tippler.

The transshipment complex for bulk iron ore substrates is equipped with the most advanced process and technological equipment; it facilitates increased goods flow on the railways of the Slovak Republic and represents a competitive alternative to the transshipment facilities of neighbouring countries.

FAMAK SA developed and manufactured the transshipping equipment, which offers high performance and ease of operation.

The purpose of the facility, which has been in operation since 2009 at the Bulk Transshipment Slovakia A.S. site, is the transshipment/reloading of iron ore from broad gauge wagons from Eastern Europe and reloading it into standard gauge wagons, and its subsequent forwarding. The facility is located in the town of Cierna over (the river) Tisou in the southeast of Slovakia. FAMAK SA carried out all the equipment design, construction and commissioning at this facility.

Unloading of broad gauge wagons takes place on the mechanical wagon tippler equipped with the wagon gravity clamping device. The tippler was designed to service four-axle wagons for the transport of bulk materials with a total weight of not more than 100 tonnes, length of 13.9m and height ranging from 3.1 to 3.8m. The locomotive is used to manoeuvre the wagons. After entering the platform of the wagon tippler and stopping, the wagon is grasped with skids fitted to rails, and the wagon is tipped until it is completely empty. In the case of incomplete emptying of the wagon after the rotation action of the tippler, operators can use the electrovibrators which are automatically attached to the wagon's sides and the wagon is set into the short-term vibration which helps the remaining material to fall out. Unloaded material falls by gravitational force into the funnel hoppers located directly under the tippler's drum.

The capacity funnel hoppers have been designed with an adequate reserve to allow them to receive material from more than one wagon. The ability to maintain a reserve makes it possible to have a continuous stream of material in the rest of the facility, regardless of the frequency of the wagon tippler operations. The height of the funnel was chosen so that, through the large tilt angles of load-bearing walls, the chance of ore sticking inside the hoppers is minimized, eliminating the need for further electrovibrators.

Between the hoppers and the tippler's drum, there are built-in gratings, through which the unloaded material pours. Their task is

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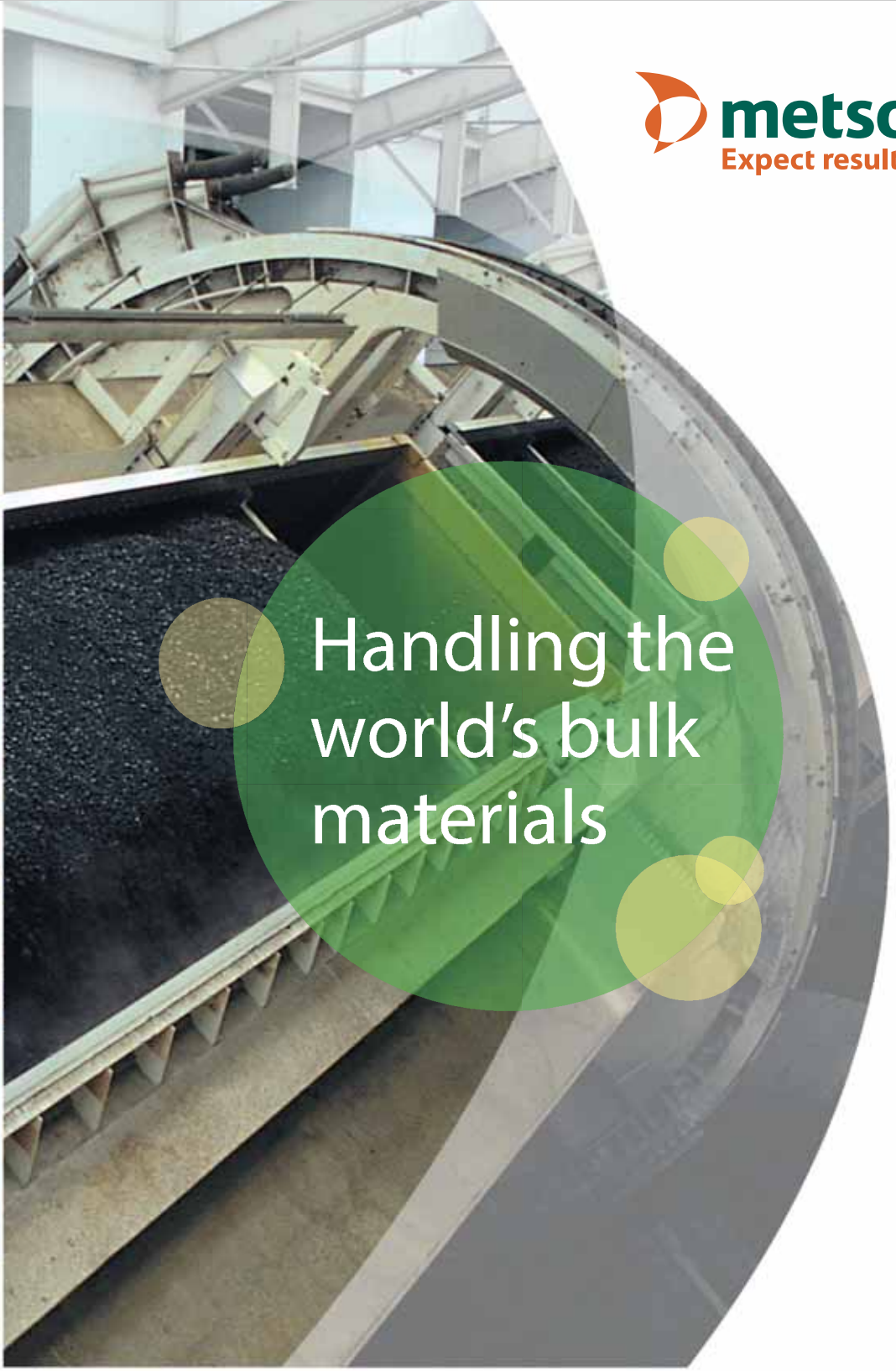
to break down the frozen material and to provide an initial stoppage of polluted material that has overall dimensions larger than the grille/grating's mesh, which could be mixed in with the ore. Grids are also the bases upon which two drum crushers move. The task of crushers equipped with the fast rotating drum is crumbling/crushing of strongly frozen lumps of ore, which have not been broken after hitting the bars. When necessary, tippler operators start the crushers after the end of the wagon rotation. During the tippler's operation, the crushers are moved away completely from the funnel's grating.

At the bottom of the funnel, there are four longitudinal slots in which chain scraper conveyors are built in. Their task is to discharge the material from the funnel hoppers. Scraped ore is moved through the table surface, which at the same time is closing the hopper at its lower section and prevents leakage of the material. Then ore is dumped on the conveyor belt which is situated parallel to the long axis of the funnel, and then it is transported beyond the wagon tippler's hall and it continues on a Flexowell pocket type belt conveyor. The purpose of this conveyor is to transport material vertically to the height of equipment involved in loading standard wagons. With the vertical conveyor, ore is fed to the horizontal conveyors and transported to the area of the railway track standard gauge wagons for loading. The last part of the conveyor was designed as the transient one and is built directly over the railway. The technology used allows for even distribution of the material inside the wagon.

Controlling devices are located inside the air-conditioned cab control located within the tippler's hall. The camera system installed at critical points of the technological facility allows for a constant overview of the equipment and its control. Safe work during the entire unloading is provided by a number of sensors, which are equipped with individual devices, controlling the parameters of their work and the current position. Depending on the types of wagons unloaded and performance parameters of the material reloading capacity is over 1,000 tonnes per hour with an annual capacity of approximately 3.5 million tonnes.

FAMAK SA is among the market leaders in the manufacture of industrial steel structures, machinery and constructions. The company, based in Kluczbork, Poland, has been in operation since 1945, serving customers from all over the world. FAMAK SA produces equipment for the power industry, mining, metallurgy, ports, shipyards and many others, and includes a wide range of stockyard and offshore equipment in its product portfolio. The company also designs and manufactures vertical and continuous transport equipment and various handling systems. FAMAK SA has highly qualified technical-engineering staff with interdisciplinary knowledge and experience, and design development base, who implement the highest technical level in the offered products.



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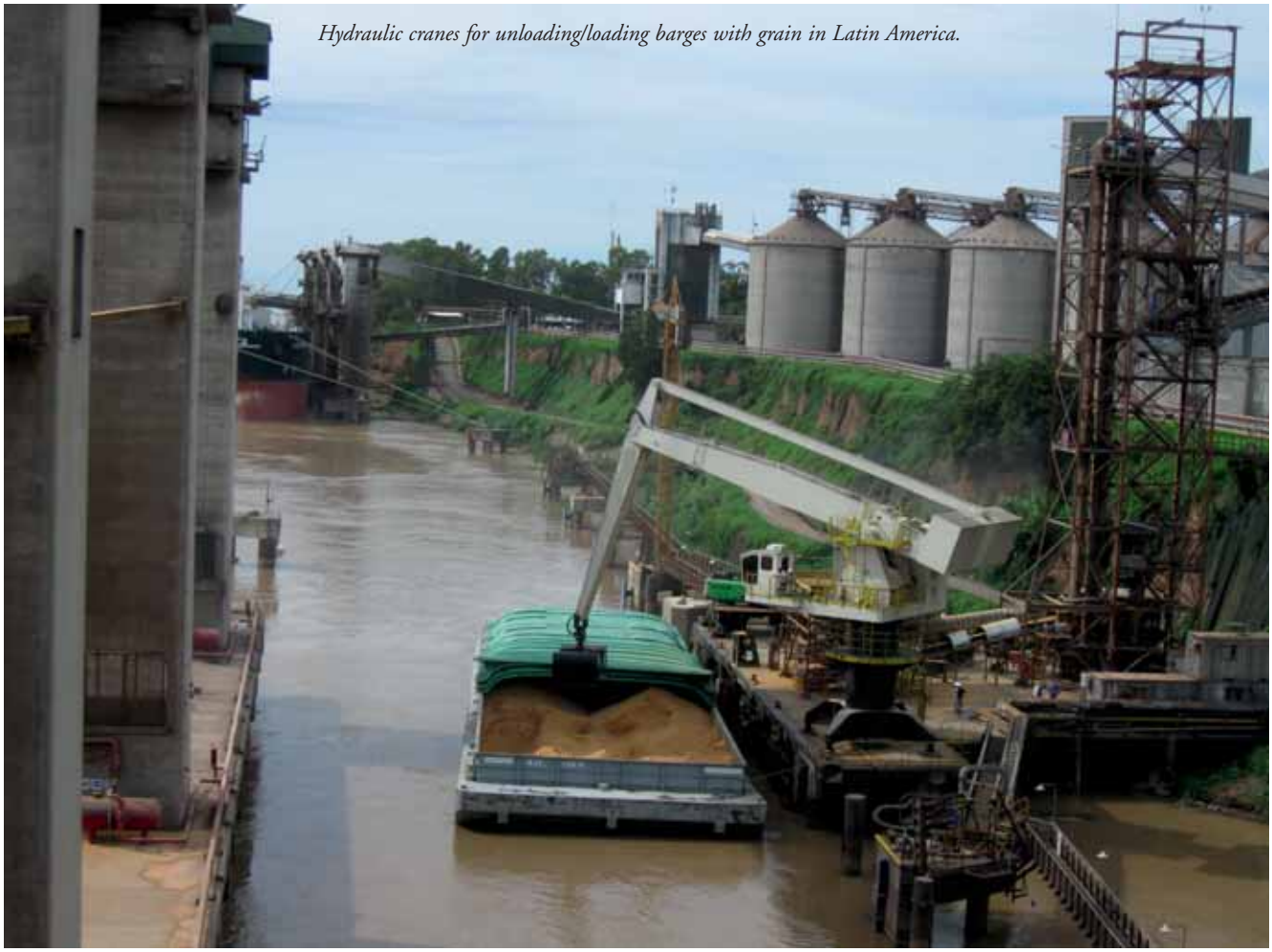
RHC Heavy Machinery: offering a range of barge and rail handling equipment

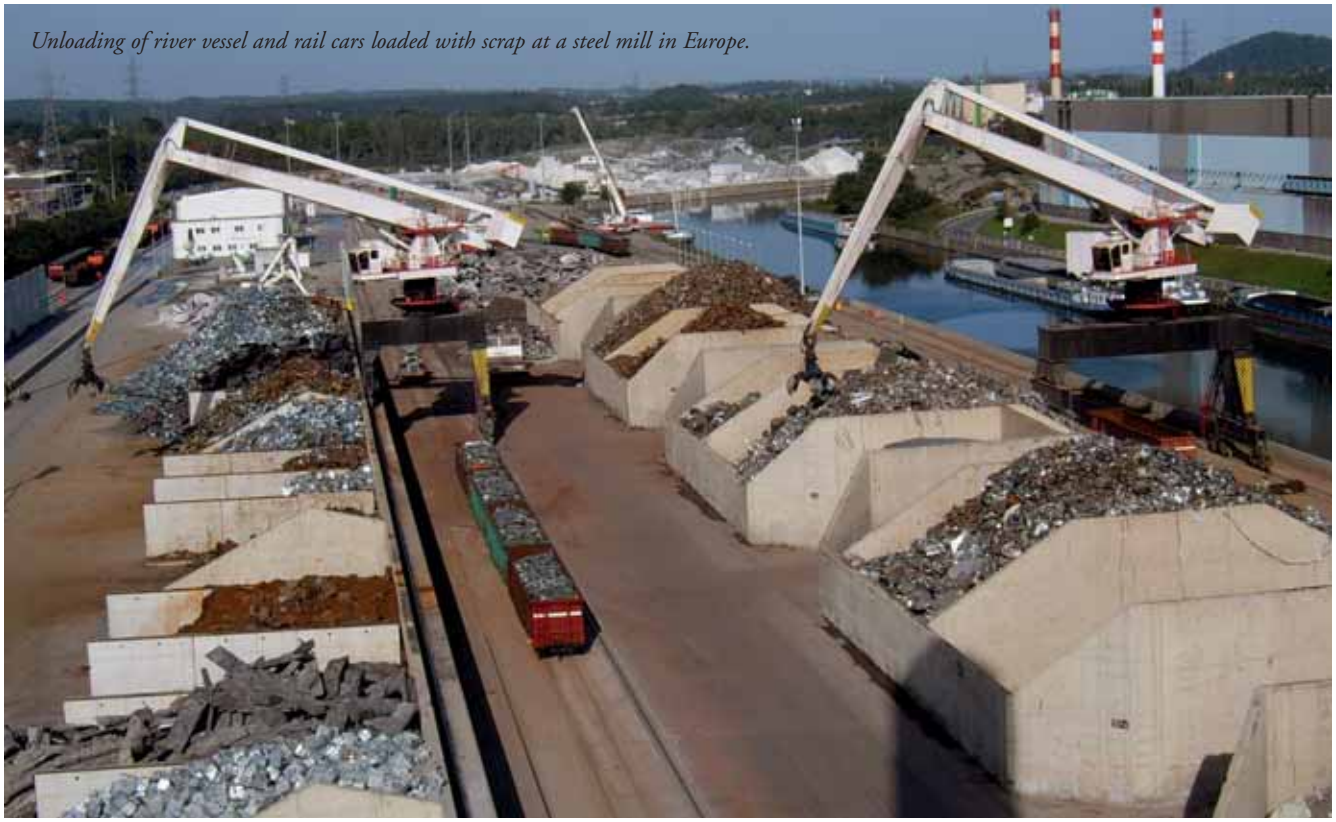


Hydraulic cranes for unloading/loading barges with grain in Latin America.

RHC Heavy Machinery is a leading provider of complete integrated solutions. Its team of dedicated German and Chinese engineering and commercial professionals have over 200 years' experience in heavy duty machinery and working with international companies.

The company specializes in industrial products.

Working with experienced manufacturers in China, it ensures that all customer requirements are correctly understood and implemented, and that all quality levels and delivery times are strictly adhered to.



Unloading of river vessel and rail cars loaded with scrap at a steel mill in Europe.

Wagon tippler.

Transshipment system (floating terminal) working in South East Asia.

Transporting material by barge and rail

Depending on the needs of the customer, RHC has a range of options for the transportation of different materials, from and to different locations.

Much of the time, grain is transported by truck or rail to the next terminal or port. Grain is generally produced by farmers in the hinterland of an exporting country. If the grain goes to a river terminal, wagons have to be unloaded by material handlers or waggon tipplers. From the wagon or storage area, the grain is loaded on to barges, which transport the material to larger ports for seagoing vessels or to transshipment systems if the port cannot accommodate seagoing vessels or no port facilities are available.

The same procedure applies in principle to all bulk materials such as ores, coal and others. Scrap handling for steel mills is more complicated. Scrap is normally delivered by seagoing vessels, by barges, by truck or by rail. If the steel mill has to unload the scrap directly from the wagon, material handlers with special right-angled grabs are mainly used. The unloading of barges or river vessels is a hard job for all kind of cranes, because, before shipping, the scrap might have been compacted and unloading needs special high-performance hydraulic cranes. Those cranes are better prepared for the handling of scrap, much faster in unloading and require less maintenance and repair. Such hydraulic cranes can be used for unloading of wagons, loading the scrap to the large size storage area, unloading of barges and river vessels and for sea-going vessel up to Panamax size.

For RHC as supplier of such material handling systems it is important to provide tailor-made solutions to all customers. Depending on the transportation chain, the company provides the wagon tippers, the hydraulic cranes as well as traditional loading and unloading systems for barges, river vessels up to transshipment systems and large size shiploaders and ship-unloaders.

In co-operation with shipyards in South East Asia, RHC is now working on new systems for loading and unloading barges, which will show a serious increase in the working speed of the entire system.

Loading chutes offers flexible and versatile loading solutions

For many years, loading chutes have been used for loading dry bulk products into different vessels, such as tanker trucks, open trucks, wagons, ships, barges, etc. The strong point of the loading chute has always been the flexibility and the versatility in respect of being able to load all kinds of dry bulk materials, under virtually all thinkable and unthinkable conditions, and in nearly all known applications, i.e. in ports, in refineries, in cement and power plants, in grain terminals, etc.

For 25 years, Cimbria has produced and installed more than 13,000 loading chutes worldwide, branded Moduflex, where the chutes are being used for loading anything from copper concentrate over fly ash and cement to fertilizer, grain and food stuff. In many cases, the chutes are loading not only one specific product, but many products through the same chutes — for instance in port terminals. Other systems on the market only offers loading in open back trucks, and only with very specific and homogenous products.

This variety can only be supplied due to the versatility of the loading chute, based on the general construction and build. The Moduflex loading chutes are designed with a unique modular construction, which means that the loading chute can be adapted to suit 99% of all known applications within the dry bulk industry, although the parts being used are standard components. This ensures that the operators know that the loading chutes are

Moduflex loading chute with integrated filter for dust-free outloading into open barge.

The Moduflex loading chutes can be equipped with a FlexSeal for ensuring a complete tight sealing of chute outlet and tanker truck hatch for highest possible dust elimination. Left, FlexSeal, deflated; right, FlexSeal, inflated.

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Answers for industry.

based on well-founded, known technology that provides the user with quick access to standard spare parts, if a breakdown occurs, so down times are kept to a minimum. On top of this, the Moduflex loading chutes can cater for capacities up to 4,000tph (tonnes per hour) in the standard configuration, and a drop of more than 25 metres. This flexibility can only be achieved using a loading chute, and is not possible in alternative loading systems.

Due to the fact that Cimbria manufactures several hundreds of Moduflex loading chutes every year, the price becomes very competitive, considering the price-quality relationship, and very low life cycle cost for the user. Installation cost of the loading chutes is negligible, as it only requires mounting the chute to the flange of the inlet with a number of bolts and connecting it to power (and pressurized air if the chute is with integral filter).

The Moduflex loading chutes can of course be used in light duty industries for loading grain, bran, food stuff, etc., but also in the heavy duty industries for loading cement, limestone, fly ash, clinker, minerals, etc. Again this versatility is founded in the ability to construct the various parts of the chute in e.g. high density polyamides, abrasive resistant steel, stainless steel, liners in Vautid and/or ceramic compound materials. Furthermore, loading of products with larger particle sizes or very low densities and little structure are virtually completely

The conical outlet ensures dust is minimized outloading by resting on the tanker hatch.

impossible to load, except through a loading chute. No other loading system can offer either the same degree of adaption to specific needs of the users, or the same safety and durability in one piece of equipment.

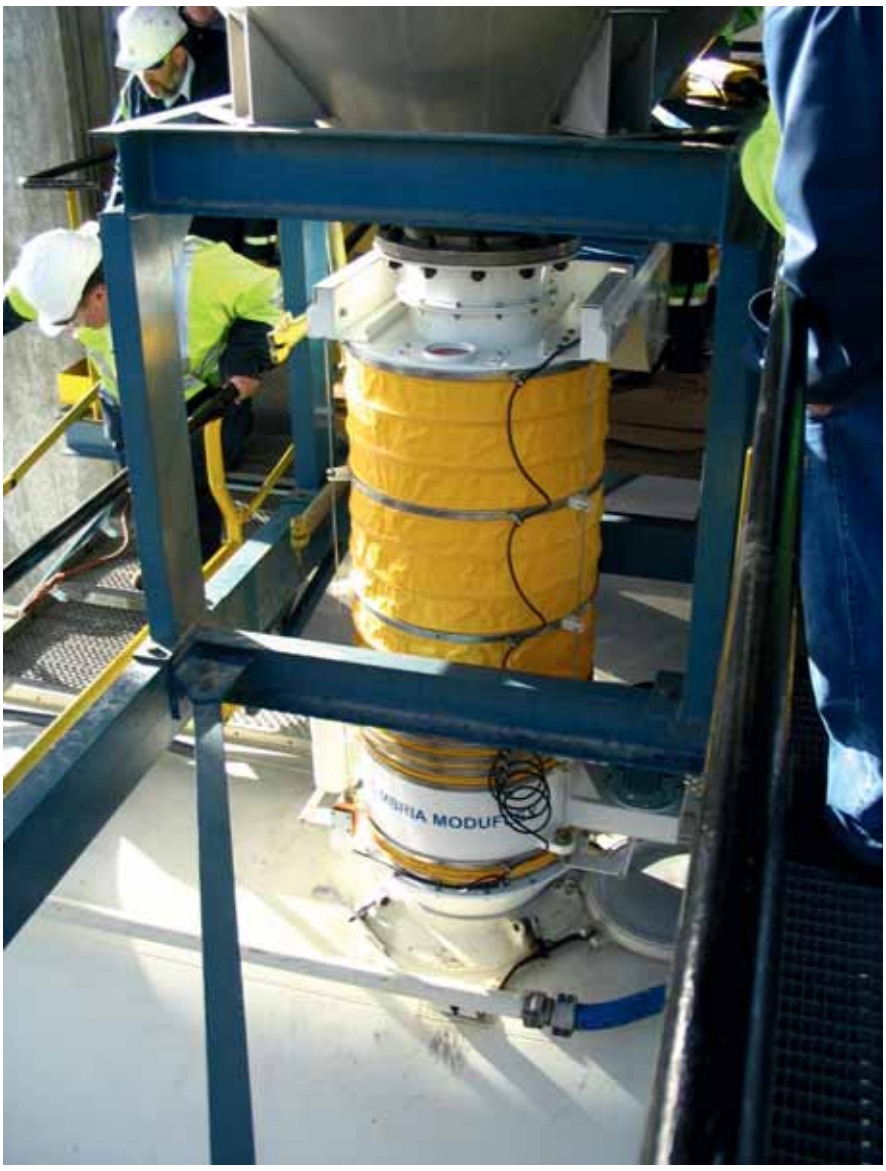
The proof of this point becomes even more evident when looking at toxic products, or products that need to be loaded in a closed system for hygienic reasons (food and chemicals), as this again is only possible using a loading chute. The demands of food safety and cleanliness within the chemical industry makes it impossible to load products as for instance sugar with any 'open' system, that exists on the market. The risk of contamination loading any product for human consumption and almost any chemical base materials in non-sealed systems is unacceptable and in some case dangerous to health. GMO products are another example of material that needs to be loaded within totally concealed systems. In order to avoid such contamination, a closed system with a closing device at the outlet that ensures an active sealing during loading and plugging when the chute is not in use, is required. The avoidance can be achieved by using accessories, FlexClose and FlexSeal, which are available for the Moduflex loading chutes.

Looking at it from a different point of view, the overall purpose of the loading chute is to ensure a dust free loading of the above-mentioned products. The environmental authorities in more and more countries are imposing strict legislation on environmental protection, and enforces these laws vigorously. This means that the 'duties' of loading involves 1) protecting the natural environment (air, water, soil), 2) protecting the surrounding ('neighbours') environment and 3) the working environment (health and safety). There is no argument against the fact that only loading chutes are able to fulfil all these tasks, and truly provide a dust free situation. Although other systems claim to do so, dust and particles will inevitably escape in the space between the outlet of the material provider (a silo or similar) and the inlet of the chute, e.g. a hopper, a hose or similar. Looking at the products mentioned above, they all have the common characteristic, that they create dust during loading. This dust needs to be confined and dealt with in a safe and efficient way, as spillage and waste of product to 'the air' not only means a nuisance to the environment, but also loss of profit. This objective can only be secured in a well aspirated loading chute, which is either connected to a separate filter or is provided with an integral filter.

The third aspect of modern loading is the varied environments where loading takes place. In some case the loading does take place inside, in nice enclosed surroundings, but the vast majority of loadings are done outside, where wind, sun and humidity is affecting the material being loaded and the loading equipment itself. As example if loading is done through a hopper system, the wind will seriously affect the free falling product, creating dust problems, and if loading is done using a simple hose or bag, the humidity in the product will affect the flow and cause disruptions in the loading procedure.

The conclusion can therefore only be, that loading chutes are, for now and for the years to come, a highly attractive alternative within loading systems where you combine flexibility and versatility with efficient loading, and at the same time adhere to the environmental legislation and work safety, that is a must for companies today dealing in loading and transportation of dry bulk commodities. Alternative systems have such a limited usage, that they can only be justified in very few applications, where the conditions and the product are so homogenous, that they will work to the satisfaction of the users. Cimbria Moduflex has built up vast experience — due to the huge installed base — within loading of all kinds of dry bulk materials. This means that whenever we are faced with ever more stringent environmental legislation and/or new demands from companies, we can draw from this experience and very quickly adapt to fulfil these demands.

The Moduflex loading chutes are designed and sold by Cimbria Bulk Equipment A/S, a part of the Cimbria Group of Companies. CIMBRIA was established in 1947 and is today an international organization with 600 employees in 15 companies throughout the world. Cimbria offers equipment and processing plants for the grain and seed industry and transport and conveying equipment for bulk handling.



Grain handling in record time with the SENNEBOGEN 840 at Hamm harbour

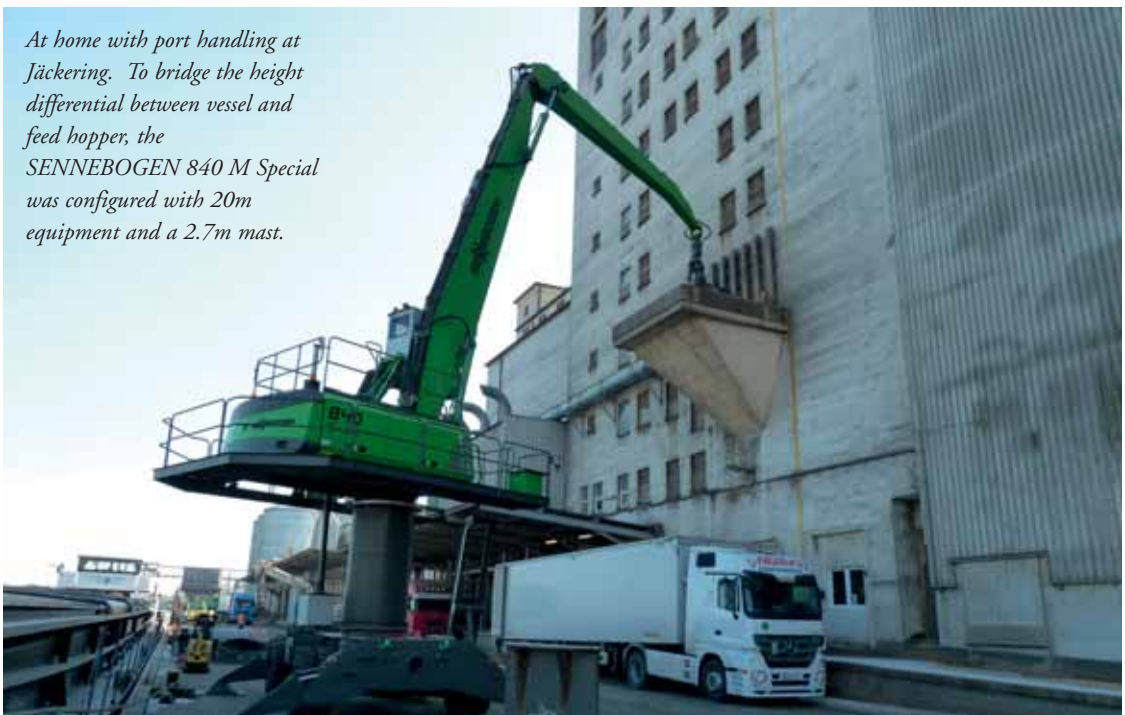
At Hamm harbour a SENNEBOGEN 840 AM Special is at work in a demanding materials handling application. Hourly the machine unloads up to 400 tonnes of wheat from the arriving vessels — including barges. The wheat is then milled and further processed by Jäckering Mühlen- und Nährmittelwerke GmbH.

Wheat flour, starch, and wheat gluten for the worldwide food industry are produced by Jäckering Mühlen und Nährmittelwerke GmbH in the North Rhine-Westphalian city of Hamm. To do this Jäckering procures grain from within an 500km radius. Bulk good freighters deliver the grain daily at Hamm harbour, where it is milled and further processed. Jäckering has relied on a materials handling machine from SENNEBOGEN since 2009 for unloading and charging the hopper attached on the harbour building.

The challenge associated with the logistics concept was the depth of the harbour basin in conjunction with the higher positioned silo hopper. In close collaboration with the local sales and service partner, BRR Baumaschinen Rhein-Ruhr GmbH, it was possible to configure the SENNEBOGEN 840 as the optimal machine, and it has now completely replaced the three former harbour rail cranes. In order to achieve an appropriate reaching depth in the hull, and simultaneously cover the height of the silo hopper, the machine was elevated by 2.7m with a mast. The 840 M Special is powered by a powerful 194kW diesel engine and it has a 20m equipment length with special materials handling kinematics. The all-wheel drive of the wide-gauge undercarriage also ensures flexible implementation of the materials handling machine along the harbour basin.

Equipped with a 3.5m³ double shell grab, operator Suleyman Durmus handles up to 400 tonnes an hour — just under 30 seconds are required for a cycle. Thus the machine already delivers more than the existing hopper can process. From the hopper the grain ultimately goes into the modern milling plants. Approximately 240,000 tonnes are processed each year, the majority of which ends up as starch or wheat gluten in world trade.

For the operator, the 2.6m maXcab, which can move forward, and be elevated by 3.0m, offers the highest level of operating comfort. Together with the armoured glass floor window and an extensive lighting package the operator always has an unrestricted view of the work area, which is very effectively illuminated. Additional railings all around the upper carriage guarantee safe work and easy access for maintenance and service.



At home with port handling at Jäckering. To bridge the height differential between vessel and feed hopper, the SENNEBOGEN 840 M Special was configured with 20m equipment and a 2.7m mast.

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Disaster recovery

IHI comes to the rescue after Japan's devastating 2011 tsunami

Devastated conveyor system after the tsunami in March 2011.

IHI Transport Machinery Co., Ltd, is one of major affiliates of IHI Corporation Group in Japan, and is a leading provider of cranes and material handling systems. Its bulk handling products include:

- continuous ship unloaders;
- belt type continuous ship unloaders;
- bridge type unloaders;
- pneumatic unloaders;
- shiploaders;
- gantry cranes for steel mill products;
- stackers;
- reclaimers;
- stacker-reclaimers;
- belt conveyors; and
- floating cranes.

One of IHI's major focuses recently has been disaster rehabilitation. It has provided a range of coal handling systems for electric power companies which suffered extensive damage by the Great East Japan Earthquake on 11 March 2011. As well as Fukushima Daiichi (No.1) nuclear power plants, coal-fired power plants in Tohoku district were seriously damaged by the aforementioned Tohoku Earthquake.

The coal handling systems which IHI had delivered to Haranomachi thermal power station of Tohoku Electric Power Co., Inc. and Shinchi power station of Soma Kyodo Power Co., Ltd. were totally destroyed by the tsunami. Since continuous ship unloaders (CSUs) and belt conveyers (BCs) for both power plants were very seriously damaged, it was assumed that enormous time would be necessary for the restoration

In these severely testing conditions, the large scale of recovery work has been carried out as national top priority project by a lot of companies, to make up for the decrease of power supply caused by the halt of several power plants in those areas. The above electric power companies, equipment and system suppliers, construction companies and other related companies united to achieve this difficult goal.

IHI also worked hard on the recovery and repair

The rebuilt conveyor system with, inset, photo of the damaged conveyors immediately following the tsunami.

construction of the coal handling systems, in order to return them to working order in the shortest possible timeframe. The company examined an effective and safe removal method for blocks of CSUs and BCs damaged by the tsunami. It was also able to reduce the time needed by promoting construction efficiency, and by manufacturing blocks of the equipment in its factories, and transporting them assembled to the site.

As a result of IHI's contribution, the Shinchi power station was able to resume power generation before the end of 2011, and the coal handling system there was back in full working order by the end of August 2012. In addition, the Haranomachi power station's coal handling system was fully restored by June 2013.

Although there are still nationwide debates and discussions in Japan about future energy after the disaster in March 2011, the Japanese government has recently presented a new national energy policy based on the optimum combination of coal and LNG-fired power as well as nuclear and renewable power. Coal especially, is back in focus as a stable source of power generation, with the establishment of advanced technology for high combustion efficiency and low CO_2 emissions. New coal-fired power projects are in demand in Japan.

IHI believes that the valuable experience and expertise it gained during the reconstruction work after the tsunami will contribute to its ability to provide coal-handling systems for future, eco-friendly coal-fired power plants — thus providing one solution for the energy needs of the future. At the same time, the company hopes that its contribution will help it to repay the kind support from all over the world in the wake of the March 2011 crisis. DCi

The rebuilt CSUs with, inset, photo of the damaged CSUs immediately following the tsunami.

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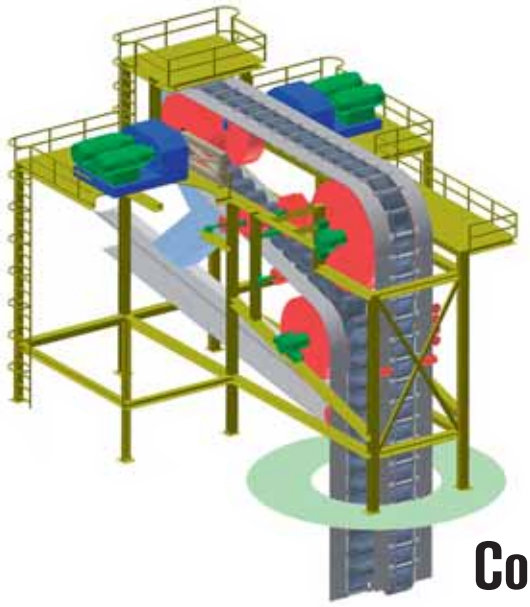
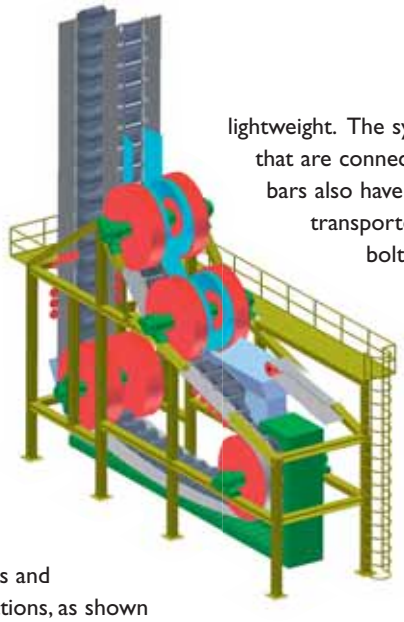
Powerful and space-saving: the POCKETLIFT® system can be used in narrow shafts and can cope with unlimited heights through modular arrangement of the conveyors.



Overcoming limits in vertical conveying

ContiTech's POCKETLIFT® has the answer



Space-saving, environmentally friendly and efficient: this is POCKETLIFT® from the ContiTech Conveyor Belt Group. In terms of conveying height and capacity, this conveyor system is the most advanced continuous conveying technology for the vertical transportation of bulk materials. With unlimited heights through modular arrangement of the conveyors and capacities of up to 6,000 metric tonnes per hour, POCKETLIFT® sets new standards in continuous vertical conveying With this performance, POCKETLIFT® is perfect for conveying materials in underground mine shafts and allows cost-effective and efficient mining operations, as shown in the American White County Coal (WCC) Mine in Carmi, Illinois, USA.

WCC was the world's first mining company to use the trend-setting technology for vertical conveying in its own mine. Even today, it still operates the world's largest POCKETLIFT® installation. The company chose POCKETLIFT® because it helped to double the conveying output in the mine without the need to sink a conveyance shaft with standard dimensions. Instead, the new shaft measures merely 3.7 metres in diameter. Consequently new coal deposits could be accessed and transported without making large-scale investments or taking up a lot of space. The company has been using POCKETLIFT® for around a decade now, and the technology has proven itself in daily use. Since 2002, the system has transported over 38 million metric tonnes of coal to the surface and has impressed people with its clear benefits versus a traditional skip hoist system.

The compact structure of POCKETLIFT® makes it an especially attractive proposition for the mining industry. While other transportation systems like skip hoist are made entirely from steel, the POCKETLIFT® conveyor is much more lightweight. The system comprises two narrow steel-cord belts that are connected by rigid triangular cross bars. These cross bars also have a guiding function. The material is transported in fabric-reinforced rubber pockets that are bolted to the middle of the cross bars. The pockets can be installed and removed individually. This structure makes POCKETLIFT® much more compact than conventional conveyor systems and therefore ideal for handling materials in mining shafts. Thanks to the minimal space required in the vertical section, the system can also be used with very small shaft diameters. "This criterion offers an immense advantage for underground mining," says Friedhelm Litz, Innovative Products manager at the ContiTech Conveyor Belt Group. "In many cases, even an existing ventilation shaft can be used. This helps to reduce construction costs".

Another advantage for system operators: POCKETLIFT® saves energy and, in turn, money too. Compared with conventional conveying systems, POCKETLIFT® needs a lower drive power. Skip hoist systems need to accelerate the materials to high speeds. This results in power peaks and therefore in higher investments for energy supply. The POCKETLIFT® system is different. Due to the continuous mass flow less drive energy is necessary. The costs per metric tonne of bulk material conveyed are well below the average — energy consumption per metric tonne and 100 metres of lift height stays below 0.3kWh. This allows mine operators to save on energy supply. Thanks to low noise emissions, the conveyor system has a much smaller impact on the environment than other products.

With its properties, POCKETLIFT® is a systematic enhancement of the tried-and-tested FLEXOWELL® technology. FLEXOWELL® conveyor systems are designed for horizontal, high-incline and vertical transport of bulk materials of all kinds – from coarse coal and ore, rock, granular sand or fertilizer

through to grain. The material transported can vary from ultra-fine, floury matter to chunks up to around 400mm in size. As with POCKETLIFT®, the advantages for system operators lie in the low space requirements and fewer material transfer points as well as in the lower energy requirement and environmentally friendly handling.

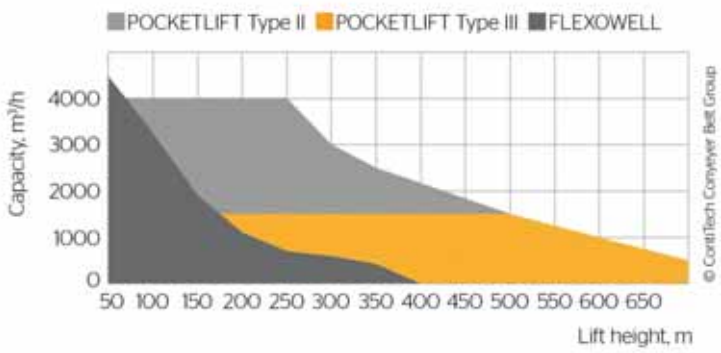
The White County Coal (WCC) Mine in Carmi, Illinois, USA, was the first mining company in the world to use the trend-setting technology for vertical conveying in its mine, and today operates the world's largest POCKETLIFT® installation. After nine years, the company has replaced the conveyor belt once.

A success story is continued

Every POCKETLIFT® is a custom design, specially tailored to the application in question. For WCC, ContiTech — in collaboration with its long-standing US partner FKC-Ltd. — has created a solution with a lifting height of 276 metres. This system is around a quarter of a kilometre in height and transports up to 1,815 metric tonnes an hour. With 782 pockets, the conveyor belt has a total weight of around 100 metric tonnes and so is extremely lightweight compared with conventional shaft conveyor systems. "Thanks to the POCKETLIFT® technology, the head gear of the shaft could be reduced to a minimum," explains Litz.

Even after more than a decade, WCC is still very happy with the POCKETLIFT® technology. The company has already renewed the system. "After conveying 30.5 million metric tonnes with the first conveyor belt over almost nine years, the system was due for replacement," says Chris Russell, the responsible mining engineer at the White County Coal Mine. Not only is replacing a conveyor belt a highly complex logistical task but it also entails downtime for the mine, so it is essential that it can be replaced as quickly as possible. This is another area where POCKETLIFT® scores. Thanks to its easy handling and excellent planning, the replacement of the belt in the White County Coal Mine took one week less than originally scheduled. As a result, POCKETLIFT® gave the customer, WCC, yet another reason to stick with this conveyor system in the future.

In the meantime, many other mine operators have become aware of the benefits of POCKETLIFT®. In addition to projects already completed in underground gypsum mining in Russia, ContiTech is also in discussion with other mine operators. "The greatest challenge at present is how to transport coal through a height difference of 1,000 metres. For this, we are intending to place two POCKETLIFT® systems on top of each other," says Litz. "And, I'm sure that POCKETLIFT® is up to this challenge".



Being a further development of the FLEXOWELL® technology the standard POCKETLIFT® Type III reaches capacities up to 1,500m³/h and unlimited lift heights through modular arrangements of the conveyors while new generation POCKETLIFT® Type II was developed for high capacities even up to 4,000m³/h. Different pocket widths for both systems allow a tailor made design exactly to customer requirements.

With sales of around €33.3 billion in 2013, Continental is among the leading automotive suppliers worldwide. As a supplier of brake systems, systems and components for powertrains and chassis, instrumentation, infotainment solutions, vehicle electronics, tires and technical elastomers, Continental contributes to enhanced driving safety and global climate protection. Continental is also an expert partner in networked automobile communication. Continental currently employs around 182,000 people in 49 countries.

The ContiTech division numbers among the leading suppliers of a host of technical rubber products and is a specialist for plastics technology. The division develops and produces functional parts, components and systems for the automotive industry and other important industries. ContiTech currently has a workforce of approximately 29,700 employees. In 2013 it recorded sales of about €3.9 billion. DCi

Automated bulk management

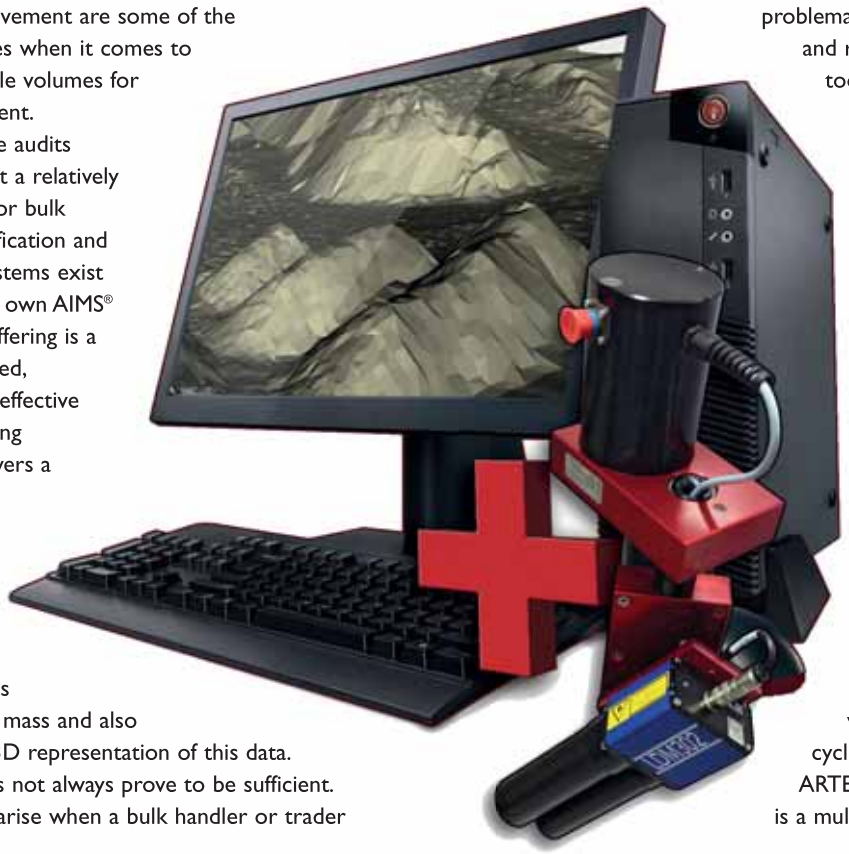
Daily volume quantification for hard and soft bulk commodity stockpiles

There are various methods to store hard and soft bulk commodities, each with their own challenges, but the majority of hard bulk is still stored on open air stockpiles. Mines, power stations and bulk handlers employ this storage method due to the flexibility, functionality and cost saving that it affords. Dust and mass fluctuations caused by the elements as well as constant stock movement are some of the foremost challenges when it comes to quantifying stockpile volumes for effective management.

Moment-in-time audits currently represent a relatively effective method for bulk commodity quantification and as such various systems exist to do so. Ronin®'s own AIMS® moment-in-time offering is a highly recommended, accurate and cost-effective independent auditing service which delivers a moment-in-time snapshot of bulk commodity stock in storage. AIMS® reports important information such as volumes, densities, mass and also delivers accurate 3D representation of this data. This however does not always prove to be sufficient.

Complications arise when a bulk handler or trader requires an elevated level of control over valuable bulk commodities on one or more storage sites. This can only be achieved in the form of accurate and reliable daily reconciliations coupled with the ability to manage multiple bulk storage sites.

Moment-in-time, daily aerial surveys and drive-through scans would prove problematic due to prohibitive costs and reporting timelines. Ronin® took note of this need and applied the experience and expertise gained over a decade of involvement in the bulk handling industry to engineer and develop a comprehensive, permanently installed, bulk commodity quantification solution in the form of ARTEMIS® 300.



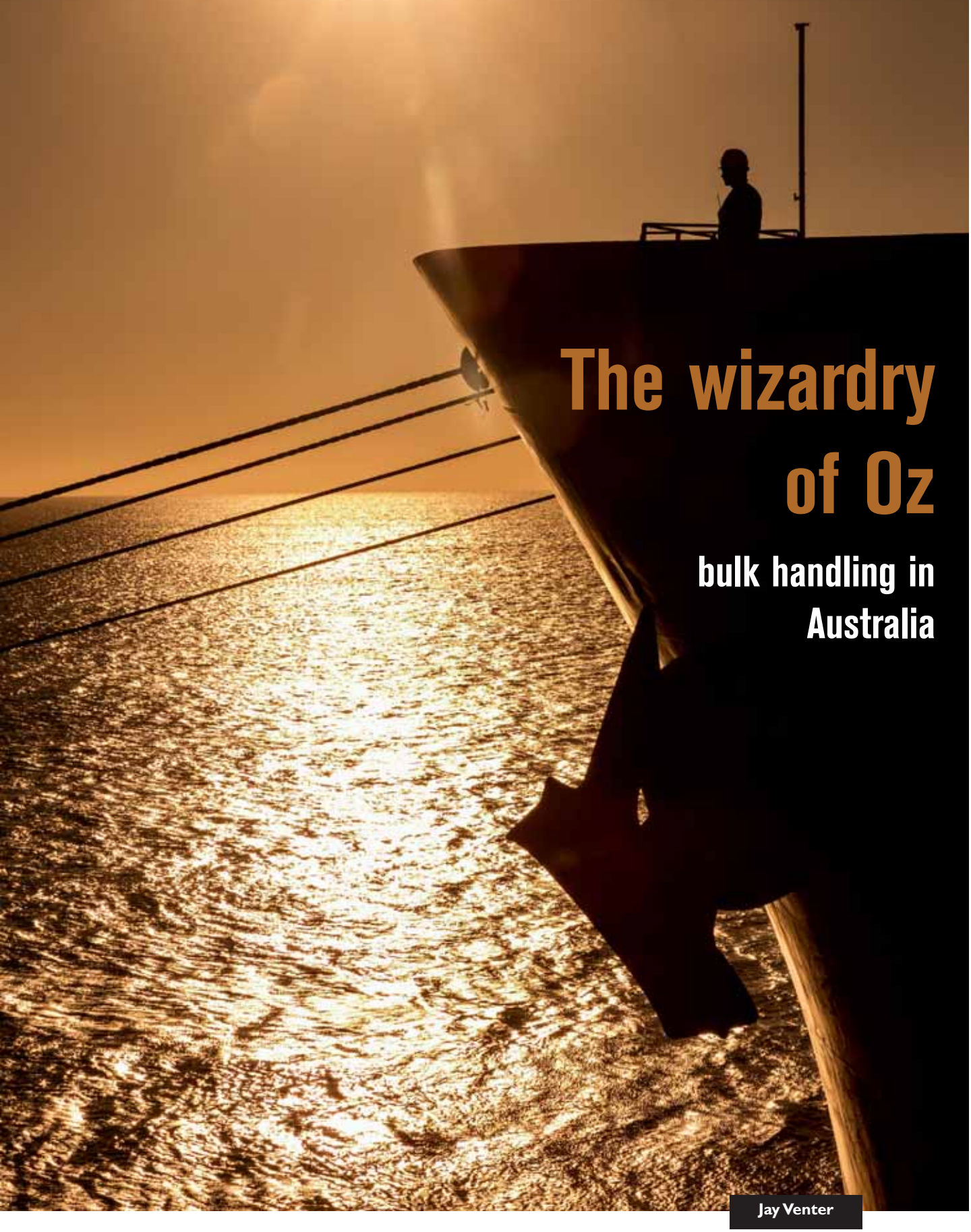
ARTEMIS® 300 is an automated hardware and software solution that requires minimal to no operator input. It follows an optimal scanning cycle and accurately reports volume information when a cycle is completed. The ARTEMIS® 300 hardware element is a multi-axis 3D surface scanning

Ronin's Art Software literally places the control at your fingertips.

non-ignition laser architecture capable of sourcing spatial data in high saturation environments, over relatively large distances and from multiple angles. This simply means that the system can scan during the day while mounted high above a stockpile without igniting flammable commodities. Ronin's proprietary software, AIMS® & ART®, provide the digital crunch required to interpret and report sourced data while simultaneously ensuring a high degree of accuracy.

AIMS® proprietary software gives name to Ronin's AIMS® moment-in-time service as it is this software running Ronin's auditing rigs. In the case of ARTEMIS® 300 the AIMS® software acts as middleware informing the ART® front end with the volume data required to effectively report and manage open air bulk on a daily basis. High levels of accuracy are possible without post scan editing due to years of development, field trialling and operations invested in Ronin's ART®, ART+®, AIMS® and ARTEMIS® 40 bulk quantification solutions. This experience has been distilled into the apex solution that is ARTEMIS® 300. ARTEMIS® 300's software is capable of automatically adjusting scan results by scrubbing spikes, deleting known structures and including invisible parameters such as surface levels and content bounds. The software can also be customized to reflect and incorporate user parameters.

ARTEMIS® 300 solution is an industry-revolutionizing system that arguably represents one of the most cost-effective and accurate, permanently installed bulk quantification solutions available on the market today. Its pedigree will ensure that the customer's bulk commodity will always be effectively managed from on or off site.



The wizardry of Oz

bulk handling in Australia

Jay Venter

Introducing Qi, the next generation maritime risk platform

Each year more than 240 customers worldwide — including charterers, ship owners, terminals and banks and insurers — rely on RightShip's Ship Vetting Information System (SVIS™) as part of their maritime risk management process. Around 75% of RightShip's business comes from the dry bulk sector.

Rising fuel costs, oversupply of capacity, turbulent freight rates and pressure on the availability of skilled staff can result in vessel maintenance standards slipping as ship owners cut costs to remain profitable. With 20% of the fleet responsible for the majority of casualties, a reliable vetting system, combined with advice and support from maritime professionals is essential for charterers seeking to reduce the risk of casualties, cargo damage, costly delays and detentions. Terminal operators utilize SVIS™ to prevent substandard vessels from entering their facility

while banks, insurers and P&I clubs rely on it to supplement their internal risk processes and meet Basel III requirements.

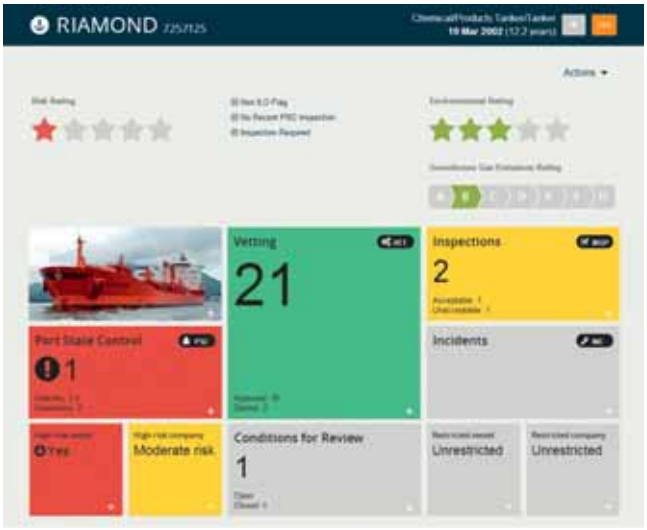
In October 2014, RightShip's new risk management platform Qi (pronounced key) — an acronym for Quality Index — is scheduled to go live. Qi builds upon the award-winning SVIS™ platform and embraces big data, predictive analytics and real time risk assessments to better target substandard maritime performance leading to improved safety. The platform will utilize the same IBM analytics engines that power the Formula One Grand Prix and Grand Slam tennis tournaments.

What is big data?

With 2,500 billion bytes of new data created every day, 63% of companies are already gaining a competitive advantage analysing huge volumes of data to improve their productivity and reduce costs. Vast quantities of ever-changing data are analysed by sophisticated algorithms to spot patterns and draw conclusions from data sets too large, diverse or dynamic for an individual to analyse without technology. Qi has the ability to instantaneously analyse maritime data such as port state control inspections, casualty history, satellite data, terminal feedback to identify anomalies, trends and intelligently compare data. It also has the potential to integrate social media such as Twitter, LinkedIn, instant messaging and satellite data which would provide details of incidents or casualties in real-time. By 'slicing and dicing' data multiple ways, the platform will discover linkages that would otherwise go unnoticed.

How does it work?

RightShip is taking the learnings and successes of other industries, refining them and applying them to the maritime sector. Using the existing model to determine the baseline



While all the calculations are complex, the Qi system simplifies the risk assessment with an easy-to-understand star rating and detailed reasoning matrix.

efficacy, Qi validates the risk profile of peer groups of comparison based on the size and type of vessel under consideration and a smoother is being incorporated. Qi will also integrate new factors such as sanctions, engine and the human element to provide a more comprehensive risk assessment.

Similar to how a vessel was rated in SVIS, Qi weights risk factors and analyzes the information to come up with a star risk rating for the vessel at that particular time and date. If a ship has had a recent incident, multiple port state control detentions, multiple owners, class or flag changes the algorithm will penalize it and it will be given a lower risk rating in the RightShip five star rating system. For example, a vessel with five stars is predicted to perform much better and have a lower incidence of a casualty than a vessel with a one star. While all the calculations are complex, the system simplifies the risk assessment with an easy-to-understand star rating and detailed reasoning matrix.

The future has arrived

While RightShip is still in the preliminary stages of understanding the full gamut the predictive analytical capabilities Qi will deliver, the initial results have been very promising. A pilot study has identified the factors leading to greater loading throughput with existing infrastructure through the use of predictive modelling and more informed selection.

Traditional voyage cost calculations are dominated by vessel specific charter rates, fuel consumption, port dues and brokerage. If selection considerations are driven by micro/vessel factors there is a significant imbalance with the macro/terminal objectives addressing the annual quantum loaded (180,000 tonnes Cape vessel vs 240,000,000 tonnes in the case of some terminals).

Learnings from vessels which perform efficiently or causes of delays do not currently feed back into the selection process to influence future selection practices.

Statistical learning algorithms exist to quantify these outcomes to make better vessel selection decisions. These techniques can be retrospectively applied, validated and refined based on existing data libraries and blind tested against a clean data set to ensure efficacy. Once operational, these techniques can also be used to provide a framework to evaluate the effect of a range of factors — as a function of tonnage forgone — to calculate the total cost of selection.

These factors include:

- ship scantling configurations such as strange hatch setup — what is optimum and why;
- crew performance — poor draught management, poor deballasting planning, inexperienced senior officers, propensity for grounding;
- mechanical failures of pumps and hydraulics;
- Port State Control delays and linkages to performance of sister vessels; and
- mooring configuration and rope materials

Qi will help to open up the black box on maritime risk and ultimately industry will benefit as it utilizes this sophisticated technology to better understand the factors that contribute to ensuring a sea voyage is completed safely and more efficiently. RightShip looks forward to giving back to industry and sharing aggregated statistics and the benefit of analytical insight that Qi will deliver.

Patrick and the Asciano Group – integrated bulk import and export solutions

Patrick and the Asciano group of companies connect Australia and New Zealand to the rest of the world by delivering integrated port, road and rail solutions to its customers and the shipping industry.

Handling in excess of 200mt (million tonnes) of bulk product every year at more than 35 ports across Australia and New Zealand, Patrick's 8,000 skilled and motivated employees deliver industry-leading service to the dry bulk sector.

Dene Ladmore – Eastern Regional Manager, Patrick Ports and Stevedoring, Lucinda Machell – SHE Coordinator, Port Kembla and John Hall – Operations Manager, Port Kembla at the 2013 Environmental Awards Gala Dinner in Sydney.

Patrick driving innovation

Patrick prides itself on its ability to deliver innovative bulk handling solutions that are tailored and developed to suit its customers' needs.

Innovative loading solutions at Port Kembla

The team at Patrick Port Kembla has implemented a range of innovative bulk handling solutions which respond to its

Patrick's rotating spreaders at Patrick Stevedoring, Port Kembla.

Mobile Telestacker Conveyor - Patrick Stevedoring, Port Kembla.

Patrick Ports and Stevedoring 'snake sandwich conveyor' loading system at Port Adelaide.

customers' ever-changing needs and specific requirements. This sets it apart from its competitors. The Patrick rotating container loading system and the mobile conveyor ship loading solutions offer flexibility to manage diverse bulk cargoes, such as:

Pit-to-port solutions — copper concentrates and rotating spreaders

Patrick has implemented a rotating spreader shiploading solution for a customer exporting copper concentrates through Port Kembla. The solution required procurement of purpose-built equipment including over 500 containers, three rotating spreaders and upgraded rail infrastructure. The containerized copper concentrates are delivered to Port Kembla by another Asciano group company Pacific National, with Asciano managing its customers' product from the rail siding close to the mine into the ship's hold.

Award winning coke loading solution

In 2013, the Patrick Port Kembla team won an Environmental Improvement Initiative Award for an innovative coke loading solution. The award was received from the Environmental Protection Authority (EPA) and presented by two major members of the Steel Transport Safety Network — BlueScope Steel and OneSteel.

The award winning solution involves the use of a mobile conveyor system to load coke across the customer's berth at Port Kembla, and has resulted in more than 1mt of coke being loaded seamlessly without major incident or non-compliance. Importantly, this innovative loading solution has resulted in significant cost savings to the customer.

Innovative loading solutions at Port Adelaide

At Port Adelaide, Patrick provides facilities, equipment and capability for the import of fertilizers and other bulk commodities into South Australia, delivering a 'ship-to-shed' service in partnership with its sister company Mountain Industries (a part of the Asciano Group). Ownership and management of the integrated 'ship-to-shed' supply chain delivers tangible productivity benefits to Patrick's customers in Adelaide.

In addition, Patrick and Pacific National deliver an integrated rail and port export solution to a mineral sands customer, handling the product from collection at the mine site into the ship's hold. To deliver this 'pit to port' solution, Patrick designed, procured and now operates an innovative high lift mobile shiploader in Adelaide. The shiploader uses a 'snake sandwich conveyor', which fully encloses the conveyed material to facilitate dust control while allowing the conveyor to elevate at high vertical angles and operate on a narrow wharf apron. It is the most efficient shiploading conveyor of its kind in the world, and again demonstrates the innovative solutions Patrick offers to make bulk handling easy for its customers.

World class operations at Patrick Ports

GeelongPort — fertilizers, cement clinker, woodchips and other dry bulk

Patrick is the operator of GeelongPort, jointly owned by Asciano. GeelongPort manages end-to-end operations for major stakeholders, including: port management, maintenance of the port infrastructure, ship scheduling and operation of bulk import and export facilities. Patrick's experience as a port operator provides customers with a reliable and trusted partner for the management of bulk port facilities and infrastructure.

GeelongPort provides an extensive range of cargo handling facilities to offer customers world class service, such as: an innovative woodchip loader, berth and conveyor systems designed and procured by Patrick on behalf of a customer, 15 berths, storage sheds, head stands, shore cranes, hoppers and conveyors and stackers.

Pictured: GeelongPort. Photographed by Katrina Lawrence.

Port of Albany

Patrick and the Asciano Group jointly owns and operates a 2mtpa woodchip export facility in Albany comprising rail receival, conveyors, stacker, reclaimers and a 1,000 tonne per hour slewing and luffing ship loader.

Patrick provides a comprehensive service to its customers which includes coordination of rail receival, stockpile management, scheduling and ship loading for two woodchip companies.

The level of commitment and control means that Patrick is responsible for the customer's product from the time it is discharged from the rail wagons, through to loading onto the ship.

Asciano and Patrick's ability to combine innovative infrastructure solutions with commercial ingenuity is a key differentiator in the market. Its integrated logistics solutions provide leading customer experience and cost savings to its customers.

State-of-the-art Agricultural solution

Mountain Industries, a subsidiary of Asciano, has recently designed and built a state-of-the-art fertilizer storage and distribution facility in partnership with a key customer. The

Mountain Industries state-of-the-art truck loading and weighing operation.

facility offers a sophisticated blending and out-load system that enables its customer to deliver a fertilizer mix to its own customer's exact specifications, including additional micro nutrients automatically. The facility also has an integrated bagging system, allowing Mountain Industries' customer to deliver to its client the product it needs, in the package it can accommodate.

The blending and outload system feeds into two conveyor belts which can simultaneously load separate fertilizer streams into two trucks. Each truck is weighed while loading, to ensure that both axle and gross weights meet customer requirements, and more importantly, are legal weights.

The outload system is fully automated enabling the customer to track stock and invoice customers from automated reports.

Ship to factory manufacturing solutions

The Asciano group recently implemented a 'ship-to-factory' import solution on behalf of a plasterboard manufacturer based in Sydney. Given the urban location of the port, significant work was required to ensure minimal impact on the environment and nearby residents.

The group's teams worked with the customer and the port corporation to increase productivity and reduce discharge noise to minimize the impact of its customers' operations to the community, such as:

- Receiving and recording noise complaints from the public for resolution and improvement;
- Making adjustments to existing equipment to reduce noise;
- Re-aligning rosters to avoid working during sleeping hours;
- Implementing a revised receival methodology at the customers site to increase productivity.

Front end loader operation inside a Mountain Industries facility.

Product blending at Mountain Industries

These improvements, combined with the integrated capability of Patrick and Mountain Industries to manage all parts of the supply chain from the vessel to the customers' facility, have significantly increased and improved productivity for customers. Patrick and mountain Industries look forward to working with its customers to continue breaking records on upcoming shipments.

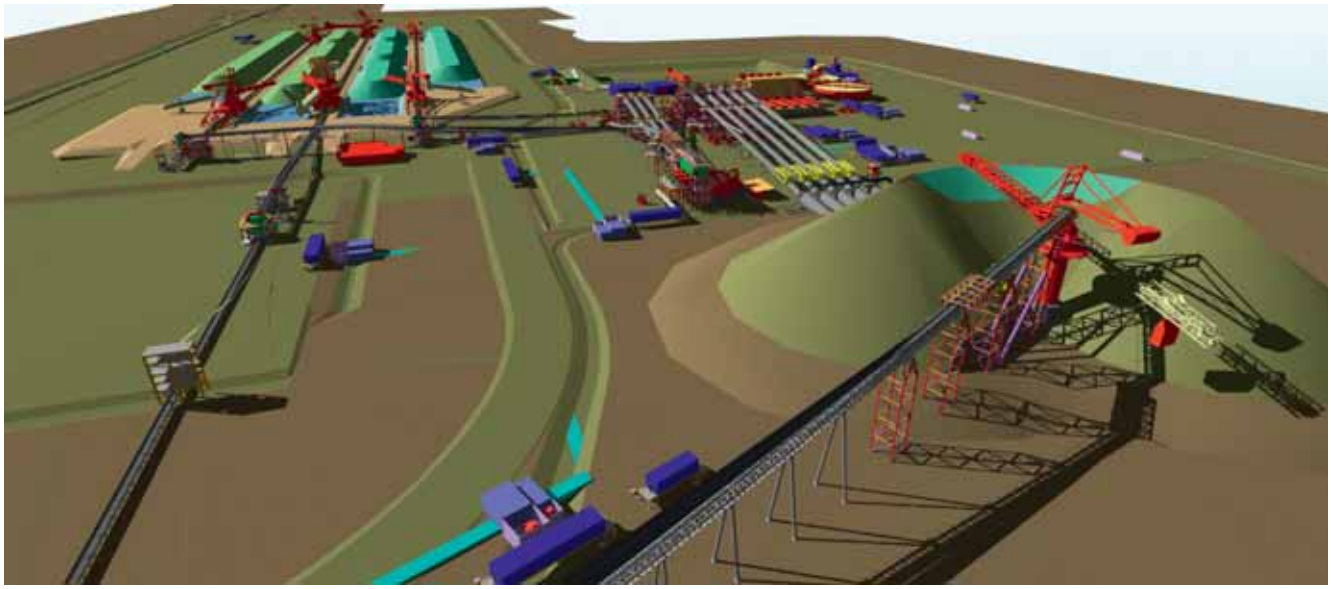
Conclusion

The Patrick and Asciano group of companies offers the flexibility, capability, innovation and footprint to source and deliver purpose built bulk handling solutions.

From the export of minerals and agricultural products, to the import of input materials required to support its manufacturing and agricultural sectors, its bulk handling experts can design a range of 'best in class' handling solutions to ensure clients can deliver a leading experience to their customers.

Gypsum discharge in Sydney

DF plays vital role in Australian iron ore project



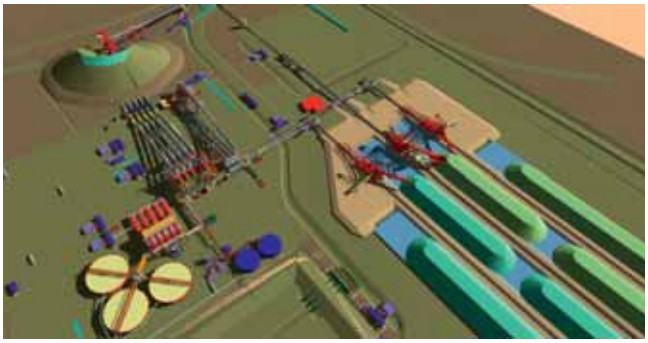
Duro Felguera (DF), the Spanish industrial group, has been instrumental in the Roy Hill iron ore project in Australia. The Roy Hill Project was designed to export 55mt (million tonnes) of iron ore; the project includes the mine, process plant, storage yard, heavy railroad system from mine to port and new port facilities southwest of Port Hedland, in Western Australia.

Within this megaproject, DF was awarded the contract to supply the process equipment/electrical systems and the EP (engineering and procurement) package of the ore handling system both at the process plant storage yard and at the large port facility.

The handling equipment for the process plant and port has a capacity of around 14,000tph (tonnes per hour), which ranks it within the range of the largest in the world.

Within the process plant, which includes five main parallel process lines, the main equipment is described as follows:

- three units of primary and secondary crushing;
- five scrubbers;
- five modules of wet coarse and fines screens;
- three modules of tertiary crushers and dry/wet screens;
- five modules of deslime cyclones;
- five up current-classifiers;
- five modules of first and second stage of spirals;
- five belt filters;
- three tailings thickeners;
- five apron feeders;
- three belt feeders; and
- laboratory



In addition to all the belt conveying system, in excess of 12km in length, the following main handling equipment will also be designed, manufactured and supplied after being preassembled and tested at the factory:

Process plant site:

- one iron ore fixed slewing stacker 13,700tph;
- one fines ore travelling/slewing stacker 5,600tph;
- one lump ore travelling/slewing stacker 5,600tph; and
- one travelling/slewing bucket wheel reclaimer 16,700tph.

Port site:

- two ore travelling/slewing stacker 14,500tph;
- one car dumper 12,900tph;
- one travelling/slewing bucket wheel reclaimer 16,700tph;
- one travelling/slewing shiploader 12,700tph.

Rio Tinto: landmark Pilbara iron ore operational performance ahead of schedule

On 13 May 2014, Rio Tinto announced a major milestone for Australia's largest integrated mining project, with its Pilbara iron ore system of mines, rail and ports reaching a run rate of 290mtpa (million tonnes per annum), two months ahead of schedule. Early completion of the expansion has added significant value to the Pilbara operations, with continued ramp-up of the system contributing to the record first quarter production achieved this year.

The achievement further underlines the world-class status of Rio Tinto's Western Australian iron ore operations and follows completion of the infrastructure component in September 2013, which itself was delivered four months ahead of schedule and $400 million under budget.

Rio Tinto Iron Ore chief executive Andrew Harding said "This is a significant milestone which adds real value for our business and our shareholders by moving more iron ore through the Pilbara at low cost. "We are now focused on the next phase of our expansion towards 360mtpa. The infrastructure is on schedule for completion in a little over 12 months and, from a base run rate of 290mtpa, we have a rapid, low-cost pathway to increase mine production capacity by more than 60mtpa between now and 2017."

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Speakers

• Susan Oatway, Senior Consultant, Drewry Shipping Consultants Ltd • Jeffrey Landsberg, President, Commodore Research & Consultancy • RA Dr. Erich Schmitz - Managing Director - Verein der Kohlenimporteure e.V. • Jonathan Challacombe, Associate Professor in Maritime Studies & International Logistics Plymouth Business School • Peter Sand, Chief Shipping Analyst, BIMCO • Christian Ingerslev, Vice President, Head of Business Development Desk, NORDEN A/S • David Peel, European Manager, RightShip • Ulrich Koester, Managing Owner, Maritime Tecnet GmbH • Capt. Giordano Scotto d'Aniello, Commercial Director, Coeclerici S.P.A • Ian Adams, Executive Director, International Dry Bulk Terminals Group • David Trueman, DBIS • Han Ozturk, Managing Director, Nectar • Johan Pruisken, Director Advisory Group Heavy Industry & Logistics, Royal HaskoningDHV • Teus van Vianen, Delft University of Technology • Brian Pittenger, Director Business Development, Jenike & Johanson, Inc. • Micha de Jong, General Manager, Wuvio Chemicals • Professor Mike Bradley, Greenwich University • Ian Atkinson, Engineering Director, C Spencer Ltd • Fergal Buttimer, Director, Buttimer Group

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Growing bulk and general cargo activity at Ports North

The Port of Cairns, located on the north-eastern coast of Australia, is owned and operated by Far North Queensland Ports Corporation Limited, trading as Ports North, a Queensland Government Owned Corporation.

Renowned as one of Australia's busiest cruising destinations, Cairns also boasts a growing bulk and general cargo business providing a northern gateway between Australia and Asian markets.

This growth was confirmed recently with an announcement by the world's largest listed metal recycler, Sims Metal Management, that it would continue regular exports of scrap metal from the Port of Cairns, following successful trials. Sims cited the ability to bring in Handymax bulk carriers to a loading berth close to the Sims metal yard and an increasing volume of scrap from the surrounding region as improving the overall cost effectiveness of the Cairns export operation. It had previously opted to transport processed scrap by road to southern ports for export to markets in Vietnam, Korea and Thailand.

The Port of Cairns is multi-purpose and supports both industry and tourism. Bulk cargo through the port consists primarily of petroleum, sugar, fertilizer and liquid petroleum gas.

Cairns has long been the natural consolidation and redistribution centre for supplies that are shipped to coastal communities north of Cairns as well as the Torres Strait Islands and the Gulf of Carpentaria. It is ideally located to supply and service mining operations in Papua New Guinea and Indonesia.

The Port has extensive land holdings that are leased to port customers and is home to one of Australia's largest fishing fleets. The Cairns Marlin Marina is a 261 berth Marina accommodating a variety of cruising vessels, superyachts and reef vessel operations servicing the Great Barrier Reef.

Plans for future wharf and channel expansion will further improve efficiency and access to the Port of Cairns.

Ports North is responsible for the development and management of nine ports across the Far North Queensland regions including Cairns, Cape Flattery, Karumba, Mourilyan, Skardon River, Quintell Beach, Thursday Island, Burketown and Cooktown.

Ports North's operations and facilities are vital to the economic development of the regional centres they service and the Queensland tourism and export performance. Its combined port operations handle bulk shipments of sugar, molasses, silica sand, zinc, fuel, fertilizer, log product, livestock and general cargo.

In a further sign of growth in the region, Ports North recently confirmed a 400,000-tonne-per-annum iron ore export operation through its Port of Mourilyan, about 100 kilometres south of Cairns. This regional coastal port also exports raw sugar and molasses from the region's sugar growing districts as well as live cattle, woodchip and log product. Port infrastructure includes onshore sugar and molasses handling and storage facilities, a livestock export facility and commercial wharf within a sheltered natural harbour. There is ample capacity to expand into new bulk cargo exports.

The Port of Cape Flattery is situated more than 200 kilometres north of Cairns. The port exports of silica sand from the Cape Flattery mine, operated by Cape Flattery Silica Mines Pty Ltd, one of the world's largest producers and exporters of silica sand. The port has onshore silica sand handling and stockpiling facilities and a 500-metre, single trestle jetty and conveyor running from the mine to an offshore berth and ship loader. There is also a general purpose wharf for the import of fuel and other supplies for the mine and for the mooring of two line boats which assist in ship berthing.

The Port of Karumba is located at the mouth of the Norman River in the south-east corner of the Gulf of Carpentaria. Karumba is a transhipment port. Its primary export is zinc concentrate from the Century Mine which has been exported through the port since 1999. Zinc slurry is piped 304 kilometres to the port from the mine, dewatered and loaded onto a 5,000 tonne, fully enclosed transfer vessel for the 40 kilometre journey to the export ships that anchor in deep water in the Gulf of Carpentaria, about 24 nautical miles off the coast.

Other facilities in the port provide for general cargo, fuel, fish products and the export of live cattle. Karumba also acts as a transshipment port for Mornington Island, other Gulf communities and the Port of Weipa for the majority of the year.

TMGA – port logistics provider

serving the Galician region

Terminales Marítimos de Galicia S.L. (TMGA), is a port logistics services and stevedoring company, located in the north west of Spain. It was established in 1995 in La Coruña. The company's activity is centred in the Galician Region, mainly in state ports like La Coruña and Ferrol, but it also operates in smaller regional ports (Cee, Laxe, Cariño, Celeiro, Burela and Ribadeo).

As a customer-oriented organization, its policy is clearly geared towards giving its customers the best possible solutions and optimal service at all times. To achieve this goal, it has a flexible and efficient workforce consisting of 70 highly qualified people with great experience and practical knowledge.

Since the company was founded, it has carried out a number of strategic investments which allows it to have the most advanced technical means available to deliver the following services:

- **Cranes:** six automobile port cranes up to 140 tonnes lifting capacity (LIEBHERR – GOTTWALD), two material handler mobile cranes up to 25 tonnes lifting capacity (SENNEBOGEN) and three rail mounted cranes up to 30 tonnes lifting capacity.
- **Warehouses:** 16,000m^2 storage capacity alongside berths with handling systems such as trippers and weigh bridges.
- **Bulk storing facilities:** closed conveyor belt system and two mobile ecological hoppers.
- **Additional equipment:** two ecological hoppers, conveyor belts and four vertical silos for loading directly onto trains.

TMGA is also in charge of the operation and maintenance of the 100,000 metric tonne dome storage facility, owned by GNF, to store the coal discharged from the vessels and loaded directly into wagons by means of four vertical silos.

During its years of operation, TMGA has gained a wide range of experience and specialist knowledge in the handling of all types of cargoes:

- **General cargoes:** logs, wood chipboard, timber, steel products, aluminium, etc.
- **Containers:** dry cargo, reefers, stuffing, etc.
- **Bulk cargo:** grain, coal, petcoke, fertilizers, etc.
- **Project cargoes:** wind mills, special cargoes and big structures.

In the last five years TMGA has handled over 13 million tonnes of all types of cargoes and has carried out operations on more than 3,000 vessels.

TMGA is a company with a clear commitment to safety, quality and environment:

- **Safety:** TMGA provides a safe working place, equipment, training and safety system that is safe to use and which doesn't involve any risk to health or safety to workers.
- **Quality:** TMGA satisfies the requirements of the clients and execute quality projects as to their expectations and requirements.
- **Environment:** TMGA delivers sufficient instructions, public awareness, continual reviews and regular inspections of systems, information and training of all workers to ensure its activities do not involve any risk to health or to the surrounding environment.

Since its inception, TMGA has been closely related to the forest industry from raw products (green sawed timber, white timber, logs, etc) and also finished products (chipboards, plywood, etc). Some of its customers, with which it has worked since it began operating, are industries with international recognition such as FINSA and SONAE.

TMGA offers a complete port logistics service for a wide variety of forest products which compounds the whole process from reception, classification, storage, internal port transport, loading, stowage and lashing operations.

The company also has a stock control and monitoring system of cargoes using WIFI and RFID technology, which gives to its

customers real time information about their cargoes.

Depending on the type of cargoes and its quality requirements, it will be stored inside open air port facilities (green sawed timber, logs, etc) or in closed warehouses within the port (white Nordic timber, chipboard, dry sawed timber, etc).

TMGA's aim is to give its customers the most specialized service possible and to handle a wide variety of cargoes. Since it began operating, the company has boosted its technical assets, acquiring equipment like forklifts of different tonnages and specialized equipment for handling forest products — such as mobile material handler cranes and front loaders.

This year, TMGA has started a new service consisting of handling timber logs in depots close to the forest production areas. Its equipment and specialized workers are located in these storage places to carry out the reception and the loading of trucks, classification and packing of logs in 4- to 5-tonne packages.

This additional service, together with its core business, port handling and stevedoring, allows TMGA to offer its customers a wide and versatile solution for their needs. The company works hand in hand with them in the whole logistic process from its origin, near to the forests, to the end, loading onto the vessel.

TMGA is a relatively young company but with enough experience in all port logistics areas. Its motivation is to add value to its customer's logistics chain, offering an excellent service through the experience and knowledge of its workers together with its technical equipment, which adapts to each type of cargo.

DC

Pulp fiction?

the facts on Brazil's pulp market

Patrick Knight

Will markets absorb the extra 6mt (million tonnes) of pulp to be added to output in Brazil in just three years, without causing prices to fall?

With numerous high-cost mills being shut down in North America and Europe each year, the companies forming the industry in Brazil, which claims to be the world's lowest-cost producer of market pulp, hope to find customers for the 6mt which will be added to output between January 2013 and late next year, without causing prices to fall.

Brazil, the world's third-largest producer of market pulp after the United States and Canada, will soon be making more than 20mt and exports will exceed 12mt a year before long as well.

The export of 9.63mt of pulp in 2013 earned Brazil more than $6 billion dollars, 5% of the country's total export earnings, while the export of almost 2mt of paper earned about US$2 billions.

There is a lot in the pipeline. In the past few weeks, the Suzano company, Brazil's second largest, has started up its 1.5m-capacity mill at Imperatriz, in Maranhao state, the first large mill in the north east region.

The 1.5mt capacity Eldorado mill at Tres Lagoas, in Mato Grosso do Sul state, built by an associate of the world's largest meat producer, JBS and which started producing pulp in January last year, has now attained full capacity. Eldorado expects to add about 200.000 tonnes extra capacity by de-bottlenecking at the new mill in the next few months.

The Chilean owned CMPC company will start up new a line at the Guaiba mill in Rio Grande do Sul state, which it bought from Fibria a couple of years ago, taking capacity there to 1.5mt early in 2015. Guaiba pulp will be exported from Porto Alegre or Rio Grande.

Fellow Chilean company, Arauco, together with Stora Enso, a partner in Brazil with Fibria at the Veracel mill in Bahia state, is in the process of starting up a 1.5mt-capacity mill in neighbouring Uruguay. This mill will also provide extra competition for the new mills being built in Brazil.

Market sources suggest that about two million extra tonnes of pulp are needed to meet demand worldwide, which grows by about 2% each year. If several elderly and high-cost mills close down, however, as they have done in recent years, markets may be found for more than that, without causing prices to fall.

The old established Klabin pulp and packaging company has started work on a new 1.5mt pulp mill in Parana state. A blend of both eucalyptus and pine wood will be used to make the pulp which Klabin has found is most suitable for making the high quality packaging papers which are its speciality. Klabin is a leading supplier of the packaging used to contain liquids, with Tetrapak its leading customer for this product, both in Brazil and abroad. Demand for liquid packaging has grown faster than supply in recent years, as the range of goods packed in containers formed of layers of board, plastic and aluminium, soars. The range of sizes is being extended as well and Klabin now has no spare capacity in the area of liquid packaging. Klabin's paper is shipped from the port of Paranagua, and arrives there by train.

Eldorado is anxious to make a start on duplicating its mill at Tres Lagoas and after a long gap, Fibria, which has had its investment grade status restored after reducing its debt level from four or five times its annual revenues, to just over twice annual earnings in the past couple of years, also plans to build a new line at its mill at Tres Lagoas. Fibria's new mill will start up in 2018 or so.

Some of the pulp from Fibria's mill is processed into printing and writing paper at an adjacent mill owned by International Paper.

The great majority of Brazil's pulp and the 2mt of paper, most either tissue or packaging which is exported, leaves from three ports, Santos, Paranagua and Portocel.

All the pulp produced by Fibria at its Tres Lagoas and Jacarei mills leaves from Santos, where the company has its own warehouses, as does that from the Eldorado mill. Most is taken about 1,000km to the port in special trains. Santos also handles large quantities of paper each year.

Almost 70% of the 10mt of pulp exported by Brazil each year

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	2013	2012	2011	2010	2009	2008
Pulp	9.620.356	8.940.182	8.919.445	8.803.049	8.591.577	7.216.543
Paper	2.102.154	1.873.189	2.051.259	2.073.305	2.007.305	1.979.613

leaves from the Portocel port in Espirito Santo state. Portocel is owned jointly by Fibria and the Japanese owned Cenibra company, whose mill is in Minas Gerais state, alongside the Vitoria-Minas railway, which is owned by the Vale mining company.

The pulp shipped from Portocel includes all that made at the three lines at the now elderly and relatively small Aracruz mill, a pioneer when it first started up 25 years ago, together with pulp from Suzano's Mucuri mill in Bahia state. Pulp made at the Veracel mill, jointly owned by Fibria and Stora-Enso and that made by Cenibra in Minas Gerais also uses this busy port.

Portocel also handles timber brought along the coast by barge for use at the Aracruz mill, which reduces the pressure caused by thousands of heavy trucks on roads.

The third port, which handles virtually all of the packaging paper exported by Klabin, most of it destined for countries in Europe, or the United States, is Paranagua in Parana state, also linked by rail to Klabin's mills.

All the pulp to be exported by the new Suzano mill will be taken 600km by rail to the deep water port of Itaqui, in Maranhao state along tracks owned by Vale.

The port of Itaqui has the advantage of being three to four days less sailing time to destinations in north America and Europe than ports in the south, which means the cost of transport will be lower.

With most of the pulp from the Suzano's new mill to be sold to the United States and Europe, the pulp produced at Suzano's Mucuri mill, in Bahia state, and Suzano's mill in Sao Paulo will in future go to China via South Africa, rather than to North America and Europe.

Two other companies are being tempted by the advantages brought by shipping from the north, as well as by the fact that land costs much less there. One is a company presided over by Osmar Zogbi, previously chief executive of the Limeira mill, in Sao Paulo state, sold to Fibria, or VCP as it then was, a decade ago. Mr Zozbi is putting together a consortium involving international as well as Brazilian capital to finance this mill. Another new mill is planned for Mato Grosso do Sul state by the newly formed Braxcell company.

Despite strenuous efforts, the Brazilian pulp exporters have not been able to persuade paper companies in North America, Europe and China, to pay up to $20 per tonne more for their pulp in the past few months. The Brazilians claim that stocks are relatively low and demand strong, so a rise is justified. But it seems that the industry will have to make do with the advantage brought by the fact that the Brazilian currency fell by 18% against the US$ and other currencies last year.

The devaluation means the Brazilian companies get more in the local currency in which most of their costs are incurred than before. Although the fact that much of the finance from new mills comes from abroad, means debts in foreign currency now cost more to service, following the weakening of the real.

As well as the closures of mills in North America and Europe in the past five or six years, with capacity there cut by about 5mt, growth in demand from China, particularly for the tissue paper which has become Brazil's main speciality, has slowed slightly. Growth could fall further in the next few years, as the Chinese authorities attempt to restrict GDP growth to around 7%, compared with the 10% of the past 20 years.

The prospect of slower growth in China, now the destination of about a quarter of the pulp exported from Brazil, worries many in the industry. Although because much more is now sold to China than was the case a decade ago, the base is much higher.

Virtually all the new pulp mills built in Brazil in the past few years, have been largely financed by the National Development Bank, the BNDES.

One of the functions of the BNDES is to identify industries in Brazil which have the potential to compete successfully in world markets. None fulfills this criteria better than pulp.

Following steady investments in forestry and genetics, trees can now be cut six years after clones have been planted, two years less than was normal a decade ago.

Trees take an average of 13 years to reach maturity in southern Europe, 30 years in China, and not much less in much of North America.

Until recently, trees were usually allowed to sprout twice after the first cut.

But advances in productivity mean that is now rare for a plantation not to be grubbed up and planted with a higher yielding variety after just two cuts. In some cases, trees are grubbed up after just a single cut. This means that the same amount of wood is produced from a far smaller area than in the past and up to 40 tonnes of wood can be added to forests on each hectare of land each year.

The two largest companies in the industry, Fibria and Suzano, both feel that to continue to survive in an increasing competitive world, a new round of mergers in Brazil would be beneficial. They have called on the BNDES, the main source of finance for the industry, to help bring this about.

Other companies, notably the Chilean-owned CMPC, thinks that the market should be left to decide the best course of action.

One company which has benefited greatly from BNDES finance has been JBS, now the world's largest meat packing company. In the past decade JBS has been loaned huge amounts of BNDES money to buy meat packing plants around the globe, as well as to build its Eldorado mill.

The Eldorado mill now owes seven times its annual earnings, compared with the two or three times of most competitors. JBS's Eldorado is anxious to duplicate its mill in Mato Grosso do Sul, but so far the company has not been able to persuade the pension funds of three of Brazil's leading state owned companies, another important leading source of finance for the industry, to lend it more.

Fibria, which now has capacity to make 5.3mt of pulp at its three mills, owes less than twice its annual revenues, Suzano only slightly more, while the always conservative Klabin company now owes very little, and will still owe less than a year's earnings when building and financing its new mill is at its height. DCi

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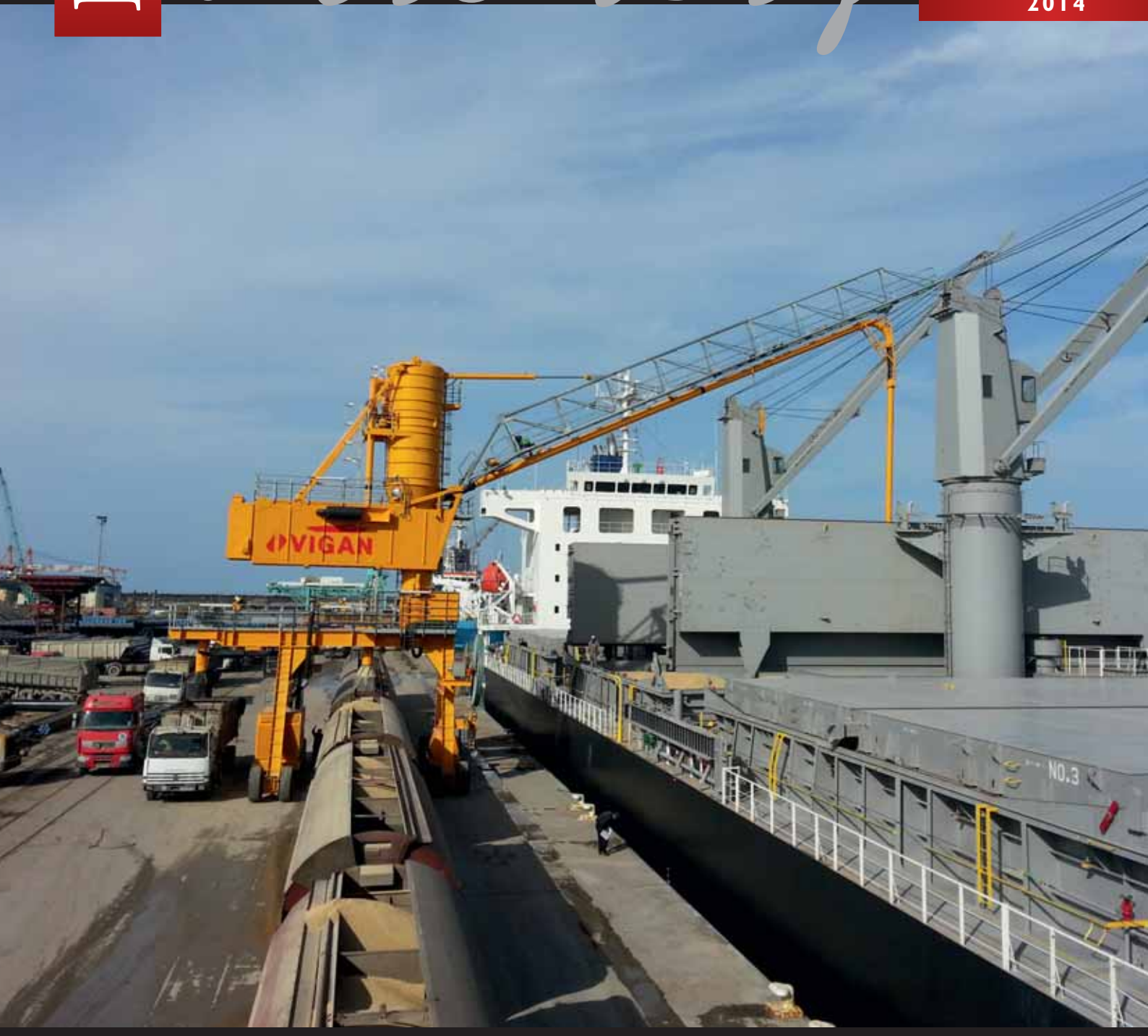

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We have a big scale of products: Grabs - Wheelloader, excavator and demolition equipment - Tipping Trailers - Hooklift carriers - Harbour- and industrial trailers.

C Spencer Ltd

One Humber Quays
Wellington Street West
Hull
HU1 2BN
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Contact: Mr Joe Booth
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E: engineering@cspencerltd.co.uk
W: thespencergroup.co.uk

Cachapuz Bilanciai Group

Parque Industrial de Sobreposta
Apartado 2012
Braga
Braga
4701-952
Portugal
Contact: Mr Nuno Matos
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E: info@cachapuz.com
W: www.cachapuz.com
Cachapuz is a reference in the implementation of innovative solutions to automate the logistics, dispatching, reception and weighing processes in industrial plants. With a modular platform and extensive know-how, Cachapuz is able to meet the needs of several sectors worldwide.

Calim Grab Industry

Piri Reis Cad
Çınar San.
Sitesi No:46 Maltepe
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81540
Turkey
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F: + 90 216 399 79 71
E: info@calimkepce.com
W: www.calimgrabs.com or www.calimkepce.com
Calim Grabs is a manufacturer of mechanical, electro-hydraulic and remote controlled grabs.

Camar Mill Systems Ltd

P.O. Box 419
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St. Jacobs
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N0B 2N0
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F: +1 519 664 3700
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Cambelt International Corp

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84104
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Job Title:VP, Sales
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F: + 1 801 972 5522
E: info@cambelt.com
W: www.cambelt.com
Suppliers of fully moulded sidewall belting, high incline conveyor systems, dome storage reclaim systems and conveyor components.

Cargotec Sweden Bulk Handling AB (Siwertell brand)

PO Box 566
Gunnarstorp
Bjuv
SE-267 25
Sweden
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F: + 46 42 858 99
E: blksales@cargotec.com
W: www.siwertell.com
Siwertell dry bulk handling systems are based on a unique screw technology and provide the most environment-friendly, efficient and versatile operation on the market today. All systems can be tailor-made to fit each port or terminal.

Caterpillar Belgium

Ave des Etats Unis
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B6041
Belguim
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Caterpillar Inc

100 NE Adams Street
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USA
Contact: Mrs Sharon Holling
Job Title:PR
T: + 1 309 675 8995
F: + 1 309 675 4757
E: Holling_Sharon_L@Cat.com
W: www.cat.com
Wide range of front end loaders, bulldozers, wheel loaders etc, used for all types of bulk products and different industry applications.

Cavotec Deutschland GmbH

Ludwig-Erhard Strasse 1a
Eschborn
D-65760
Germany
Contact: Dipl.-Ing. Thomas Dreyer
T: + 49 6196 50950 20
F: + 49 6196 50950 22
E: thomas.dreyer@cavotec.com
W: www.cavotec.com
Cable management systems with electrical cable reels, hose reels, cables/hoses with up to 25kV. Spring reels; Plugs and sockets/connectors up to 660A up to 25kV medium voltage collectors, remote controls with Atex.

Cavotec SA

Via S. Balestra 27
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Switzerland
Contact: Mr Michael Scheepers
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E: michael.scheepers@cavotec.com
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Cavotec Group is a global leader in connecting mobile equipment. Products from the Cavotec Group manufacturing units include: Eex radio remote controls, electrical connectors up to 15kV, flexible cables, cable reels, and slipring units. Distribution is supported by 22 Cavotec sales and service companies around the world.

CDM Systems, Inc

430 Main Street
Elk River
MN
55330
USA
Contact: Mr Andrew Parker
T: + 1 763 428 9700
F: + 1 763 428 9701
E: steve@cdmsys.com
W: www.cdmsys.com
CDM Systems offers a comprehensive array of Bulk Conveying Systems, Components and Engineering/Design Services. With over 30 years of experience, we can provide you with conveying and bulk handling solutions for Materials from Ash through Zinc, including marine applications as well as those in hostile, severe or high-temperature environments.

Cesur Packaging Corporation

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Senem Sokak No:11
Kartal
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34876
Turkey
Contact: Mr Cihan Cesur
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E: info@cesur.com
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Cesur Packaging is a manufacturer of all types of FIBC 's (Type A, B, C, D for various industries - UN, Food Grade, Hygiene big bags), PP woven bags and international dunnage bags with 82 years of experience in the industry and international markets.

CFS Handling srl.

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Chief Industries UK Ltd.

Beckingham Business Park
Tolleshunt Major
Maldon
Essex
CM9 8LZ
UK
Contact: Mr Geoff Freed
T: + 44 1621 868944
F: + 44 1621 868955
E: info@chief.co.uk
W: www.chief.co.uk
International supplier of galvanized grain storage silos and ancillary equipment. Undertake complete projects or component supply to main contractors. Manufacturing companies in USA, UK and France, providing flexibility for international design standards. Experienced in countries throughout the world.

Chief Industries, Inc.

Chief Agri/Industrial Division
P.O. Box 848
Kearney
NE
68848
USA
Contact: Mr Steve Ginter
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F: + 1 308 389 6703
E: agri@chiefind.com
W: www.agri.chiefind.com

China Huadian Engineering Co., Ltd.(CHEC)

South Gate, No 91
North Road
Xi San Huan
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100044
China
Contact: Mr Zheng Liu
Job Title:Director of Int. Mrktg, Material Handling Division
T: + 86 139 1039 7372 / + 86 10 51 966647
F: + 86 10 68 710553
E: chec@chec.com.cn
W: www.chec.com.cn
Deliver a wide range of products and services for advanced bulk materials handling systems. Design and supply of shipunloaders, shiploaders, stacker/reclaimers, circular storage systems, car dumpers and belt conveyors including pipe belt conveyors and cross country conveyors.

China Sonangol International (S) Pte Ltd

9 Temasek Boulevard #42-01
Suntec Tower 2
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038989
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Contact: Mr Eugene Tan
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E: sg@chinasonangol.com
W: www.chinasonangol.com

Christianson Systems Inc.

20421 15th Street Southeast
Blomkest
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56216
USA
Contact: Mr Mike Schow
Job Title:Sales Manager
T: + 1 320 995 6141
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W: www.christianson.com
Manufactures ship unloaders and conveyor systems under brand names of Handlair, VacBoss, Vac-U-Vator, SeedVac, ChemVac, Push-Pac, SuperTower and SuperPortable.
Equipment for the transfer of dry flowable products including grain, feed, seed, rocks and sand

Strong partner in Grain Management.

One of the big challenges of our age is to supply all the people worldwide with food. Every year, millions of tons of grain are collected, stored, and handled around the globe – and the upward trend is unbroken. Only the most up-to-date plant and equipment can guarantee rapidity and quality while minimizing raw material losses. In order to meet the increasingly stringent challenges, Bühler Grain Logistics provides with its capabilities the best possible solution – for conveying, cleaning, drying, storing, dedusting or loading and unloading the most important commodity on earth. www.buhlergroup.com

Innovations for a better world.

BÜHLER

Cimbria Bulk Equipment

Industrivej 1a
Herning
DK- 7400
Denmark
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T: + 45 72 42 24 00 / +45 96179000
F: + 45 72 42 24 99
E: cbe@cimbria.com
W: www.cimbria.com
Markets a large line of products within dustfree loading systems. Loading solutions can be delivered for all types of material using ship loading, stock piling, road and rail. Close to 30 years experience. Product programme covers all branches where bulk products are handled from agriculture to industry.

Clariant Corporation

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Contact: Mr Justin Mueller
Job Title:Head of Business Group CDP Americas
T: + 1 505 975 1676
E: desiccants@clariant.com
W: www.desiccants.clariant.com
Clariant Cargo and Device Protection offers moisture solutions such as Container Dri® II container desiccants for a broad range of transport applications: from goods traveling in conventional cargo containers to shipment and storage of sensitive electronic and semiconductor devices.

Claudius Peters Technologies S.A.S

34 Avenue de Suisse
BP 269
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France
Contact: Mr Jean Christophe Fassel
Job Title:Sales Manager
T: + 33 389 313 301
F: + 33 389 619 525
E: technologiessa@claudiuspeters.com
W: www.claudiuspeters.com
Worldwide suppliers of stacking and reclaiming equipment for linear or circular storage systems for a wide range of bulk commodities within process or dispatch terminals.

Cleveland Cascades Ltd

Unit 22 Dukesway
Teesside Industrial Estate
Thornaby
Stockton on Tees TS17 9LT
UK
Contact: Mr Ian Barnard
Job Title:Managing Director
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F: + 44 1642 753270
E: enquiries@clevelandcascades.co.uk
W: www.clevelandcascades.co.uk
Designs, manufactures, markets and installs bulk loading chutes for ship loading, silo filling, truck loading, conveyor transfer point; minimising dust emissions and product degradation, as well as segregation.

COBRA Europe SA

12 rue Henry Guy
BP 40081
Luxeuil les Bains Cedex
70300
France
Contact: Mr E Mansour
Job Title:President
T: + 33 671 58 72 56
F: + 33 384 40 44 92
E: emphone@cobra-cs.com
W: www.cobra-cs.com
The COBRA group is specialized in the manufacturing and distribution of conveyor components for the material handling industry.
COBRA group combines five businesses: Conveyor belts (Depreux, Transco, Indi), Components for conveyor (Go Smart) and Vulcanising presses (Mossier).

Cofely Experts BV

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PO Box 34
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Condepols S.A.

Avda. Iberoamérica, 35
Alcalá La Real
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23680
Spain
Contact: Mr Ignacio Baillo
Job Title:Commercial Director
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W: www.condepols.es
Manufactures and commercialises big bags made of polypropylene to store or transport merchandise ranging from 500 to 2000kg, with one or four lifting points. Also manufacture liners in polyethylene or polypropylene 'Dbulk' for maritime containers to store or transport merchandise in bulk. All the products manufactured are food approved.

Conductix-Wampfler AG

Rheinstrasse 27 + 33
Weil am Rhein
79576
Germany
T: + 49 7621 662 0
F: + 49 7621 662 144
E: info.de@conductix.com
W: www.conductix.com
Conductix-Wampfler's core competency is in the development, production, consulting, and installation of tailor made, engineered solutions like festoon systems, conductor rails, cable chains, slip ring assemblies or spring and motorized cable reels that provide energy supply and data transmission for moving machinery. Other equipment/services: Energy & Data Transmission Systems.

Conductix-Wampfler Americas

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Contact: Mr Mark Zuroske
Job Title:Market Development Manager, Americas
T: + 1 402 952 9300 ext 225
F: + 1 402 339 9627
E: mark.zuroske@conductix.com
W: www.conductix.us
Mobile Electrification systems: Motorized reels, cable festoon systems, cable chains, slip ring assemblies (including hazardous duty), and pendant or radio remote controls.

Conservatek Industries, Inc.

498 North Loop 336 East
Conroe
Texas
77301
USA
Contact: Ms Nita Bailey
T: + 1 936 539 1747
F: + 1 936 539 5355
E: nbailey@conservatek.com
W: www.conservatek.com
Designs, fabricates and installs aluminium domes and aluminium roof structures for use on tanks of various shapes and sizes. Typical applications include bulk storage enclosures.

Continental Construction (Memphis)

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38134
USA
Contact: Mr Brian Morphis
Job Title:Marketing
T: + 1 901 382 4070
F: + 1 901 388 2534
E: mail@continentalconst.com
W: www.continentalconst.com
Heavy Industrial Contractor for Foundations, Silos, Conveying, and Unloading. Call (901)382-4070 or go to www.continentalconst.com for more information.

Continental Conveyor & Equipment Co Inc

PO Box 400
438 Industrial Drive
Winfield
Alabama
35594
USA
Contact: Lou Boltik
Job Title:Director Marketing & Communications
T: + 1 205 487 6492
F: + 1 205 487 4233
E: info@continentalconveyor.com
W: www.continentalconveyor.com
The HAC® has proven itself to be a versatile and money saving alternative for elevating and lowering materials at any angle, up to and including 90° (vertical). The HAC® can be located on a ship or in a loading area.

ContiTech Transportbandsysteme GmbH

Breslauer Strasse 14
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Contact: Mr Andrew Soine
Job Title:International Sales Manager MAXOFLEX
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W: www.contitech.de/conveyorbelts
With over 30 years experience in design, manufacturing and supply, MAXOFLEX has become one of the leading solution providers in the field of steep angle conveying. Quality, reliability and service is what our customers have come to expect. We pride ourselves on delivering and no challenge is too small.

Coperion GmbH

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Contact: Mrs Andrea Trautmann
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CPS Projects (Pty) Ltd

PO Box 47261
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Durban
KZN
4023
South Africa
Contact: Mr Banzi Majola
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Affiliated with CPS Projects Pty and Salzgitter SA Pty in South Africa, Portquip Pty provides mechanical shiploaders, grabs and truck loaders and unloaders.

CST Covers

CST Industries
9701 Renner Boulevard - Suite 150
Lenexa
Kansas
66219
USA
Contact: Mr Tony Thill
Job Title:Corporate Vice President
T: + 1 913 748 4559
F: + 1 913 621 2145
E: tthill@cstindustries.com
W: www.cstcovers.com
Designs, manufactures and installs large (30m to over 145m diameter) clear span aluminium domes for covering storage systems of all types. Conveyor penetrations and support can be all part of the roof design. Each dome is custom designed to the site and customer specific requirements worldwide. Cost competitive and virtually maintenance free as aluminium does not rust, rot or solar degrade.

CST Storage

9701 Renner Blvd, Suite 150
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66110-2907
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Contact: Mr David Wheat
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E: sales@cst-storage.com
W: www.cstindustries.com
Columbian TecTank is the leading manufacturer of bolted steel, and factory welded storage tanks for the dry bulk market. Columbian TecTank is proud to introduce a new coating -Trico-Bond EP™, a high-performance, factory-applied, thermally-cured, highly-engineered modified epoxy powder coating.

Dbis (Software and Automation) Ltd

4 Railway Court
Ten Pound Walk
Doncaster
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W: www.dbis.biz
Specialize in Industrial IT Solutions. The CommTrac system is a total Facility Management solution for grain and animal feed stores, combining optimized operations and stock control with traceability and HACCP food safety procedures in compliance with legislation and assurance scheme requirements.

DCL, Incorporated

PO Box 125
Charlevoix
MI
49720
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Contact: Mr Kyle Smith
T: + 1 231 547 5600 Ext 3124
F: + 1 231 547 3343
E: sales@dclinc.com
W: www.dclinc.com
DCL provides loading systems as well as components to the bulk material handling industry. Our product line includes Loading Spouts, Loading Spout Positioners, Aeration Equipment, Shut-Off Valves, Diverter Valves, Dust Collection Equipment, Bag and Drum Filling, System Design, and Plant Automation.

De Regt Conveyor Systems

Ijzendijkseweg 5
Biervliet
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4521 GX
The Netherlands
Contact: Mr Peter De Regt
Job Title:Director
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F: + 31 115 481234
E: peter@deregt.com
W: www.deregt.com
De Regt is a company specialized in developing, building and installing conveyor systems and structures needed to achieve a partial or total project.

Dearborn MidWest Conveyor Co.

8245 Nieman Road
Lenexa
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USA
Contact: Mr Sudy L Vohra
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W: www.dmwcc.com
DMW furnishes the design, supply and erection of Grain Handling Conveyor Systems, fertilizer storage, unloading and loading systems at terminals. Some of the systems include grain storage facilities in Eygpt and China. The Products include Pipe Conveyors and Air Supported Conveyors.

Demag Cranes & Components GmbH

Benefit recipient: Gottwald Port Technology
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Düsseldorf D-40597
Germany
Contact: Mr Christoph Kreutzenbeck
T: + 49 211 71 02 3907
F: + 49 211 71 02 53907
E: christoph.kreutzenbeck@terex.com
W: www.demagcranes-ag.com
Demag Cranes & Components GmbH - a subsidiary of Demag Cranes AG - is a supplier of industrial cranes and crane components for material flow, logistics and industrial drive applications. It also offers spare parts, maintenance and refurbishment services. Represented globally by approx. 5,000 employees in 22 foreign subsidiaries and agencies in 46 countries. With more than 650,000 Demag brand cranes and hoists for industrial applications in operation, the company has the largest installed base worldwide.

DeMarco Industrial Vacuum Corporation

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Contact: Mr Thomas DeMarco
Job Title:President
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F: + 1 815 344 2223
E: Sales@DeMarcoVacuums.com
W: www.DeMarcoVacuums.com
Manufacturer of Patented DEMARCO Industrial Vacuum Systems and vacuum loaders for portable, stationary and central manifold systems. 10 to 300 HP.

Dinnissen BV

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Contact: Mr Henri A J M Michiels
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Dinnissen is an international company for bulk materials technology, machine development, processing, control, automation and engineering. Intake of raw materials, conveying, storage, mixing, drying, sieving, big-bag filling. Machines and systems for powders and granules for the chemical / pharmaceutical / food / petfood / feed / aquafeed industry.

DMN-Westinghouse

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PO Box 6
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Zuid-Holland NL-2210 AA
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Contact: Mrs Tonneke Krempel
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W: www.dmnwestinghouse.com
Offering tailor-made solutions in the design and manufacture of rotary valves, diverter valves and other components for the bulk solids handling industry for more than 40 years. The company's products are distributed and supported worldwide.

Dome Corp of North America

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Dome Technology

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W: www.dometech.com
Dome Technology Inc.,(Inventors of the thin shell concrete dome) - activities include the design and construction of modern, insulated reinforced concrete domes for both industrial and commercial applications. Dome Technology builds domes for all bulk storage products throughout the world. Products commonly stored include fertilizer, cement, clinker, gypsum, fly ash, coal, alumina, grains and mining ores. Established in 1976.

DOMTEC International LLC

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83401
USA
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F: + 1 208 522 5344
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W: www.domtec.com
Serving the bulk storage industry for many years, constructing concrete domes to store a multitude of products. The company designs and constructs high quality concrete domes, delivering projects on time and within budget. They have broad experience with a variety of reclaim systems, both mechanical and pneumatic, pending on clients' needs.

Donaldson Filtration Deutschland GmbH

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Contact: Mrs Susanne Fulko
Job Title:Marketing Manager
T: + 49 2594 781 0
F: + 49 2594 781 21
E: IAF-de@donaldson.com
W: www.DonaldsonToritDCE.com
Donaldson offers innovative dust collection systems. The products are engineered to improve efficiency, save energy and extend filter lifetime. The R&D engineers invented new filtration technologies for customers and their specific applications.

Doosan Benelux SA

Drève Richelle 167
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Contact: Mr George Schmalzried
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F: + 32 2 371 6900
E: george.schmalzried@doosan.com
W: www.bobcat.eu; www.doosanequipment.eu
Range of compact skid-steer and tracked loaders for ship-trimming and cargo hold unloading (together with grab) with operating capacities from 318-1542 kg; telescopic handlers with lift capacities from 2.2-4.0 tonnes and max lift heights from 5.2-16.7 metres.

Dos Santos International, LLC

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USA
Contact: Mrs Amy D. Duncan
Job Title:Marketing Manager
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F: + 1 866 473 2252
E: info@dossantosintl.com
W: www.dossantosintl.com
Specialists in belt conveying technology for bulk materials. One of the world's foremost authorities on high angle conveyor applications and design of sandwich belt type high-angled conveyors. Additionally, discipline-oriented engineering services in mechanical and structural engineering are offered as well as our ExConTec, a conveyor software design program.

DSH Systems Ltd.

PO Box 48052
Blockhouse Bay
Auckland
Auckland
0644
New Zealand
Contact: Mr Ian Walton
Job Title:CEO
T: + 64 275 999 592
F: + 64 9828 8012
E: ian@dshsystems.com
W: www.dshsystems.com
DSH Systems award winning dust suppression loading spouts contain the dust from free-running, dry, granular products in a tight free-falling column. No electricity required, has no internal moving parts, mitigate dust explosion risk, achieve health, safety, environmental and business benefits.

Dust Control Technology

1607 W. Chanute Rd.
Peoria
IL
61615
USA
Contact: Mrs Laura Stiverson
Job Title:General Manager
T: + 1 309 693 8600
F: + 1 309 693 8605
E: info@dustboss.com
W: www.dustboss.com
DustBoss® suppression systems deliver field-proven solutions for open-area dust issues, including source-point particle management and a family of mobile units. Proprietary technology delivers superior results and reliability, able to blanket up to 280,000 square feet with a single oscillating machine.

Dust Solutions Inc.

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E-Crane World Wide

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W: www.e-crane.com
Provides engineering, sales management and technical product support for the E-Crane fleet. The 'E' stands for equilibrium. A revolutionary hydraulic bulk material handler, the E-Crane uses the balance principle and is perfectly suited for loading and unloading ships and inland river barges, all while consuming up to 50% less energy.

E-Crane World Wide/E-Crane International USA

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Contact: Mr Mark W Osborne
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W: www.ecrane-usa.com
Equilibrium Cranes from 6 to 40 tons capacity, reach from 64 to 147 feet with project specific lowers such as fixed, gantry, rail or crawler for bulk material handling.

ECS Eurocargo Services AS

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Denmark
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E: ecs@eurocargoservices.dk
W: www.eurocargoservices.dk
Custom clearance
Evaluation of damages

Edge Innovate

30 Farlough Road
Newmills
Dungannon
Tyrone
BT71 4DT
Northern Ireland
Contact: Mr Lee Williamson
Job Title:Sales Manager
T: + 44 2887 740525
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E: lee@edgeinnovate.com
W: www.edgeinnovate.com
Edge Innovate are a blue sky thinking, imaginative and creative equipment manufacturing company. With our ethos of "Innovation at Work" EDGE persist in pushing the boundaries of design and manufacturing to produce hard working, quality machinery to fit any materials handling requirement from recycling, material handling to quarrying.

Elgin Engineering and Construction

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Job Title:Marketing Director
T: + 1 630-434-7200
F: + 1 630-434-7272
E: soros@elginindustries.com
W: www.elginindustries.com
An international consulting and engineering firm specialised in conceptual development, planning, feasibility studies, design engineering, project management, construction supervision, etc.

EMS-TECH Inc

699 Dundas Street West
Belleville
Ontario
K8N 4Z2
Canada
Contact: Ms Gail Carl
Job Title:Executive Assistant, Sales & Marketing
T: + 1 613 966 6611
F: + 1 613 966 6710
E: sales@ems-tech.net
W: www.ems-techinc.com
A multi-task, multi-discipline company specialising in design and supply of dry bulk material handling equipment, including custom designed conveyors, shiploaders, stackers and reclaimers, self-unloading ships, bulk elevators, receiving hoppers, storage/l

Enclosed Bulk Systems BV

Wijkermeer Weg 72
Beverwijk 1948 NX
The Netherlands
Contact: Mr Van der Zee
T: +31 85 877 4026
E: info@enclosedbulk.nl
W: www.enclosedbulk.com
EBS is specialized in the supply of environmental friendly enclosed conveyor belts.

Enco Engineering Inc

4410 13th Street
Wyandotte
MI 48192
USA
Contact: Ms Bobbi Lang
T: + 1 734 407 2400 x 202
F: + 1 734 676 3436
E: enco@encoeng.com
W: www.encoeng.com
Enco Engineering provides a broad spectrum of services ranging from conceptual studies through detailed engineering and supply of ship loaders and related bulk handling equipment.

Endress + Hauser Inc

2350 Endress Place
Greenwood IN 46143
USA
Contact: Mr Victor Wolowec
T: + 1 317 535 1410
F: + 1 317 353 1481
E: info@us.endress.com
W: www.us.endress.com
Processes control devices and measurement systems, which include level flow, pressure tank guaging, temperature and liquid analysis systems.

Engicon nv

Broelstraat 20
Harelbeke B-8530
Belgium
Contact: Mr Pieter Van Acker
Job Title:Sales & Marketing Director
T: + 32 56 73 21 21
F: + 32 56 73 40 40
E: sales@geldof.be
W: www.geldof.be
Specialised in the engineering, construction and erection of storage and handling installations for bulk goods. Fully equipped mechanical shiploaders; Silos; Tanks; Dust reducing hoppers and stackers; Belt, chain and bucket elevators, conveyors and screws. Large turnkey installations combining storage and handling; Environmental projects - flue gas cleaning, waste incineration plants, recycling plants.

EQUIPO LLC

Salahudeen Road
Dubai 64624
UAE
Contact: Mr Mohamad Yasar Aboobackar
Job Title:Operations & Sales Manager
T: + 971 506 408 626
F: + 971 426 822 17
E: yasararafat@gmail.com
W: www.equipo.ae

ESI Eurosilo BV

Newtonstraat 26-28
Purmerend
1446 VR
The Netherlands
Contact: Mr Jaap P J Ruijgrok
Job Title:Managing Director
T: + 31 299 630 730
F: + 31 229 630 737
E: esi@eurosilo.com
W: www.eurosilo.com
Large scale flat bottom storage silos with a Eurosilo stacking and reclaim system inside. Max.storage volume 100,000 m3 per unit.

Euromec Srl

Via Visano
78/80 Isorella
Brescia 25010
Italy
Contact: Mr Ricardo Segala
Job Title:Sales and Marketing
T: + 39 030 9958 151
F: + 39 030 995 2223
E: sales@euromecsrl.info
W: www.euromecsrl.com
EUROMEC, born from the merger of companies Eurohydromec and Isomec, has years of experience in the material handling field and the production of products such as lifting equipment, electrohydraulic and mechanical grabs and buckets.

Euro-tech Corporation

195 23rd. Street
Pittsburgh PA 15215
USA
Contact: Mr Richard W. Theobald
T: + 1 412 782 0600
F: + 1 412 782 6200
E: sales@eurotechcorporation.com
W: www.eurotechcorporation.com
Eurotech Corporation is a distributor of crane & excavator attachments. We service North and Central America. Our product range includes attachments of all types and in all size ranges including hydraulic, electro hydraulic, diesel hydraulic and mechanical grabs for bulk material handling.

Euro-Tramco BV

Spacelab 47 D
Amersfoort 3824MR
The Netherlands
Contact: Mr Hans Plekkenpol
T: + 31 33 4567033
F: + 31 33 4558149
E: hans@tramco-europe.com
W: www.tramcoinc.com
Manufactures chain, screw and bucket conveyors and 'Aerobelt' air-supported belt conveyor systems.

FAM Foerderanlagen Magdeburg

Sudenburger Wuhne 47
Magdeburg
D-39112
Germany
Contact: Mr Ulrich Schneider
Job Title:Director Sales and Marketing
T: + 49 391 6380 10 1 01
F: + 49 391 6380 10 1 99
E: sales@fam.de
W: www.fam.de
An independent company with its head office in Germany whose scope of services includes: consulting, planning, projecting, design, fabrication, erection, commissioning and plant service.

Figee Crane Services BV

PO Box 235
Zaandam 1500 EE
The Netherlands
Contact: Mr Marc Schinkel
Job Title:Business Unit Manager
T: + 31 75 6810 410
E: m.schinkels@kenz-figee.com
W: www.kenz-figee.com
Engineering, manufacturing, commissioning and service of a wide range of harbour cranes and lifting systems such as grab cranes, including floating Lemniscate cranes, single and double boom cranes and gantry grab cranes.

Flexco

2525 Wisconsin Avenue
Downers Grove IL 60515-4200
USA
Contact: Ms Kelly Clancy
Job Title:Public Relations Specialist
T: + 1 630 971 0150
F: + 1 630 971 1180
E: kclancy@flexco.com
W: www.flexco.com
Founded in 1907, this US-based company services the world's belt conveyors through subsidiaries in Mexico, England, Germany, Australia and South Africa. Perhaps best known for heavy-duty Flexco® bolt-or rivet-attached belt fasteners, the company has expanded into providing a wide range of accessory products to enhance belt conveyor performance.

Flexco Europe GmbH

Leidringer Strasse 40-42
Rosenfeld D-72348
Germany
Contact: Mr Walther Sülzle
Job Title:Managing Director
T: + 49 7428 94060
F: + 49 7428 9406260
E: europe@flexco.com
W: www.flexco.com
Manufacturer and distributor of mechanical belt fastening systems, installation tools, ceramic lagging, cleats and cleaners.

Flexoveyor Conveyor

3795 Paris St., Unit D
Denver
Colorado 80239
USA
Contact: Mr Bill Priday
T: + 1 303 375 0200
F: + 1 303 373 5149
E: billpriday@conveyind.com
W: www.flexoveyor.com
A leading manufacturer of material handling equipment for bagged material to include belt conveyors, bag palletizers, empty pallet dispenser and full pallet conveyors. Systems are complete with all required electrical controls, wiring and programming. All equipment is shipped as fully assembled as possible and is tested 100% prior to shipment.

FLSmidth Wadgassen GmbH

Karl-Koch-Strasse 1
Wadgassen
Saarland
66787
Germany
Contact: Mr Matthias Schmidt
Job Title:Sales Director EMENA
T: + 49 6834 470 0
F: + 49 6834 470 339
E: wadgassen@flsmidth.com
W: www.flsmidth.com
FLSmidth's bulk material handling systems are based on more than 70 years of experience in design, engineering, manufacturing and maintenance and are in use for the mining, processing, blending, storage and handling of any type of bulk material.

Ganz Danubius Trading Co Ltd

PO Box 1138
Budapest
H1325
Hungary
Contact: Mr Karol Bayus
Job Title:Director
T: + 36 1 350 5570
F: + 36 1 329 8041
E: gdtco@hu.inter.net
W: www.ganztrading.hu
Suppliers of mechanical shiploaders and unlaoders, level luffing harbour grab cranes, floating grab cranes and other bulk handling equipment.

Garwood Consulting Ltd

Garwood Lodge
Wentworth
Ely
Cambridgeshire
CB6 3QG
UK
Contact: Mr Barry Woodbine
T: + 44 780 102 4583
F: + 44 1353 777315
E: barry@garwoodconsulting.com
Consultancy and advice in every aspect of dry bulk materials handling for import and export plus storage and distribution including loading and discharge of ships, railcars and road trucks.

General Kinematics Corp.

5050 Rickert Rd.
Crystal Lake
IL 60014
USA
Contact: Mr Ron Fruit
Job Title:Regional Sales Manager
T: + 1 815 444 3561
F: + 1 815 455 2285
E: rfruit@gneralkinematics.com
W: www.generalkinematics.com
General Kinematics specializes in vibratory and rotary equipment and solutions for bulk processing of material in the foundry, recycling, scrap, mining, minerals, food, chemical, and wood industries. Custom engineered to your unique application.

Geométrica de México, S.A. de C.V.

Puerto Vallarta # 801
Colonia La Fé
San Nicolás de los Garza
N.L.,
66477
Mexico
Contact: Mr Fuad Dawabeh
T: + 52 81 8882 8300
F: + 52 81 8882 8301
E: sales.mexico@geometrica.com
W: www.geometrica.com/bulk-storage
Specialises in the design, fabrication and erection of bulk storage enclosures requiring large, column-free interiors. Geometrica structures may span over 300m, may be galvanised steel or aluminium. Geometrica domes are used over circular, square, rectangular, and even irregular areas.

Geometrica Inc

12300 Dundee Court
Suite 200
Cypress
Texas
77429
USA
Contact: Mr Francisco Castaño
Job Title:President
T: + 1 832 220 1200
F: + 1 832 482 0879
E: sales@geometrica.com
W: www.geometrica.com
Specializes in design, fabrication and erection of bulk storage enclosures requiring large, column-free interiors. Geometrica structures may span over 300m and may be galvanized steel or aluminium. Geometrica domes are used over circular, square, rectangular, and irregular piles.

Geroldinger GmbH & Co KG

Au-Strasse 9
Sigharting
A-4771
Austria
Contact: Mr Walter Geroldinger
Job Title:General Manager
T: + 43 7766 24370
F: + 43 7766 243724
E: office@geroldinger.com
W: www.geroldinger.com
Product range includes grain silos and bins, railcar loaders and unloaders, truck loaders and unloaders and hopper systems.

Golfetto Sangati S.r.l.

Via F.lli Bandiera, 3
Quinto di treviso tv italy
Quinto di Treviso
TREVISO TV
31055
Italy
Contact: Mrs Monica Giantin
T: + 39 0422 476700
F: + 39 0422 476800
E: info@golfettosangati.com
W: www.golfettosangati.com
Complete plants for bulk or bag handling, including pneumatic or mechanical shipunloaders (ranging from 50 to 1200 tons per hour), bulk or bag shiploaders, engineering of fully automated systems for grain handling.

Goodman Conveyor Company

U.S. Route 178 South
PO Box 866
Belton
South Carolina
29627
USA
Contact: Mr Carter Matthews
Job Title:VP Sales & Marketing
T: + 1 864 338 7793 x 102
F: + 1 864 338 8732
E: info@goodmanconveyor.com
W: www.goodmanconveyor.com
Belt conveyor idlers, screw conveyors, bucket elevators, drag conveyors.

Goodtech Solutions AS

Bjoernslettveien 2
Porsgrunn N-3917
Norway
Contact: Mr Knut Halvorsen
Job Title:Commercial Group Manager
T: + 47 35 93 05 50
F: + 47 35 93 05 60
E: knut.halvorsen@goodtech.no
W: www.portabulk.com or www.goodtech.no

Part of the Norwegian Goodtech Group, Goodtech Solutions' business network provides superior materials handling technology, services and systems, under the PORTABULK® brand, to a wide variety of user segments throughout the world.

Greystones Cargo Systems (Pty) Ltd

PO Box 22034
Glenashley
Durban 4022
South Africa
Contact: Mr Bruce Poucher
T: + 27 31 274 2600
F: + 27 31 569 2626
E: paul@cargo.greystones.co.za
W: www.greystones.co.za

Manufactures pneumatic and mechanical shiploading and unloading systems, belt conveyor systems and other bulk handling equipment.

Gulsan A.P.

Organize Sanayi Bolgesi 2 Cad. No: 18
Gaziantep 27180
Turkey
Contact: Ms Gülden Saka
Job Title:Marketing Manager
T: + 90 342 337 1180
F: + 90 342 337 2528
E: info@gulsan-group.com
W: www.gulsan-group.com

Guttridge Ltd

Wardentree Park
Pinchbeck
Spalding
Lincolnshire PE11 3UU
UK
Contact: Mr Bill Lewis
Job Title:Senior Engineer
T: + 44 1775 765300
F: + 44 1775 765301
E: sales@guttridge.co.uk
W: www.guttridge.co.uk

Manufactures a range of bulk conveying and elevating equipment, as well as storage facilities.

Guven Grab and Machine Ltd. Co

Nazim Hikmet Cad 536. sk. No: 9
Aske Köyu
Cayirova
Kocaeli 41420
Turkey
Contact: Mr Engin Demir
Job Title:Sales & Export Manager
T: + 90 262 743 8858
F: + 90 262 743 1141
E: info@guvengrab.com
W: www.guvengrab.com

Established in 1984, Guven Grab & Machine (Guven Kepce Makine) has its own manufacturing facilities. Its product range includes radio remote control grabs, electro hydraulic clamshell/orange peel grabs, mechanical clamshell orange peel touch down grabs and mechanical double wired grabs. It has supplied its units to countries all over the world.

Hanson Silo Company

11587 County Rd
8 SE
Lake Lillian MN 56253
USA
Contact: Mr Mike Hanson
Job Title:Director of Business Development
T: + 1 800 843 7456
E: hscinfo@hansonsilo.com
W: www.hansonsilo.com

Hanson Silo is the leader in Modular Precast Concrete Storage Systems.

Haskoning India Pvt Ltd

13th Floor, Maithili's Signet
Plot - 39/4, Sector 30A
Vashi
Navi Mumbai 400 705
India
Contact: Mr Hareld van den Brink
Job Title:Director of Business - India
T: + 91 22 4161 5004
E: hareld.van.den.brink@rhdvhv.com
W: www.royalhaskoningdhv.com

Hasler International SA

Z.I. De l'Abbaye
Pont-Evêque 38780
France
Contact: Mr Michel Jamey
Job Title:President & Sales Director
T: + 33 474 161151
F: + 33 474 161155
E: sales.fr@hasler-int.com
W: www.hasler-int.com

Henry International Diplomatic Marine

27502 Vilna Avenue
Santa Clarita
CA
91351
USA
Contact: Mr Jim Hill
Job Title:International Sales Manager
T: + 1 713 676 2400
F: + 1 713 673 5805
E: jhill@henry.com
W: www.henry.com

Products include:
RAM-NEK - Premium heavy duty hatch cover tape.
GULF-SEAL - Heavy duty hatch cover tape
MARITAPE-60 - Hatch cover tape
MARITAPE-40 - Hatch cover tape
KOAMING-AIDE - Coaming joint sealant
RAM-WRAP - Pipe repair system

Heyl & Patterson Inc

PO Box 36
Pittsburgh, PA 15230
USA
Contact: Mr Harry Edelman
Job Title:Executive Vice President
T: + 1 412 788 9810
F: + 1 412 788 9822
E: info@heylpatterson.com
W: www.heylpatterson.com

Since 1887 the company has designed and manufactured equipment for material handling industries. The line of equipment includes continuous barge unloaders, railcar dumpers, train positioners and railcar indexers. Heyl & Patterson's 'Cub' railcar mover, designed to move short strings of cars at slower speeds, is used by the grain industry for loading and unloading grain cars.

Horizon Conveyor Equipment

Unit 1, Hayseech Road
Halesowen
West Midlands B63 3PD
UK
Contact: Mr Alan Bowler
Job Title:Managing Director
T: + 44 121 550 2218
F: + 44 121 550 2243
E: info@horizonconveyors.co.uk
W: www.horizonconveyors.co.uk

Manufacturers of steel, plastic and aluminium and idler rollers, conveyor belt scrapers and conveyor components.

Hycontrol Limited

Larchwood House
Orchard Street
Redditch B98 7DP
UK
Contact: Mr Nigel Allen
Job Title:Marketing
T: + 44 1527 406800
F: + 44 1527 406810
E: nallen@hycontrol.com
W: www.hycontrol.com

Hycontrol manufacture a wide range of level measurement instrumentation and level switches. We measure most liquid and solid materials including, slurries, pastes, powders, grains, pellets and flakes. Measuring ranges up to 80m on a wide range of silos and tanks.

IBC International Handling AB

Hamnv. 1
Falkenberg
S-311 32
Sweden
Contact: Ms Maria Penca
Job Title:Marketing Manager
T: + 46 346 56910
F: + 46 346 56918
E: sales@ibc-international.se
W: www.ibc-international.se

IBC International Handling AB is a total supplier of services and equipment for handling dry bulk goods. We focus in particular on operational security, ergonomic thinking and environmental responsibility. Main products are FIBC filling and emptying stations with adjacent equipment.

IMASA

Palacio Valdes 1
Oviedo (Asturias) 33002
Spain
Contact: Mr Amancio Garcia
T: + 34 985 22 71 78
F: + 34 985 22 25 98
E: amancio.garcia@imasa.com
W: www.imasa.com

IMGS

Mazaya Tower AA1,
Jumeirah Lakes Towers
Suite 2906, Dubai
UAE
Contact: Mr Shahbaz Alikhan
Job Title:Director
T: + 97 144 458 335
F: + 97 144 458 337
E: shahbaz@imgs.ca
W: www.imgs.ca

Inspectorate America Corporation

12000 Aerospace Avenue
Suite 200
Houston
Texas 77034
USA
Contact: Mr Trace Griglione
Job Title:Operations Manager
T: + 1 504 392 7660
F: + 1 504 393 5248
E: trace.griglione@inspectorate.com
W: www.inspectorate.com

Interjute BV

PO Box 154
Hulst 4560 AD
The Netherlands
Contact: Mr Ed Wessels
Job Title:International Sales Manager
T: + 31 114 311208
F: + 31 114 311512
E: ewessels@interjute.nl
W: www.interjute.com

INTERJUTE is a global supplier of woven polypropylene bags and big bags with offices in the Netherlands, Spain, Romania and Brazil. Based on its 50 years' experience supplying flexible packaging materials, the company has achieved a leading position in the international bulk packaging sector offering quality, efficiency and competitive prices. We deliver from stock throughout Europe including Black Sea and Baltic ports but also to Africa.

Intersystems

9575 N 109th Ave
Omaha
Nebraska 68142
USA
Contact: Mr Ray Vrtiska
Job Title:VP Sales, Bulk Material Handling
T: + 1 402 330 1500
F: + 1 402 330 3350
E: bulkmatl@intersystems.net
W: www.intersystems.net

Intersystems manufacturers a complete line of enclosed belt and en-masse conveyors, bulk weighers, bucket elevators, samplers, probes, screeners, distributors, micro ingredient systems and bolted bin systems.

Italgru S.R.L

Statale Briantea, 4
Ambivere (BG), 24030
Italy
Contact: Mr Fabrizio Bonfanti
T: + 39 0 35 49 32 411
F: + 39 35 49 32 409
E: fabrizio.bonfanti@italgru.it
W: www.italgru.com

J & B Grabs B.V.

P O Box 176
De Meern
Utrecht 3454 ZK
The Netherlands
Contact: Mr Edgar Joustra
Job Title:Director
T: + 31 3066 21616
F: + 31 3066 63765
E: info@jb-grijpers.nl
W: www.jb-grabs.com

Designs, engineers and manufactures mechanical and hydraulic grabs for all kinds of bulk material.

Jansen & Heuning

Bulk Handling Systems
Duinkerkenstraat 11
Groningen 9723 BN
The Netherlands
Contact:
T: + 31 50 312 64 48
F: + 31 50 313 80 18
E: sales@jh.nl
W: www.jh.nl

Jem International & Express Scale Parts

6873 Martindale
Shawnee
Kansas 66218
USA
Contact: Mr James Mattson
T: + 1 913 441 4787 Ext 228
F: + 1 913 441 1711
E: info@jemesp.com
W: www.jemesp.com

Manufactures complete range of open-mouth bag filling equipment and bag closing conveyors. Also makes self contained bag plants comprising bag filling scales, bag closing conveyors, air compressor surge hoppers, control panels - all container installed and mounted.

Jenike & Johanson Inc.

400 Business Park Drive
Tyngsboro MA 01879
USA
Contact: Mr Brian Pittenger
Job Title:Director Business Development
T: + 1 978 649 3300
F: + 1 978 649 3399
E: mail13@jenike.com
W: www.jenike.com

Bulk solids handling engineers with nearly 50 years of field experience. Based on the scientific approach, the company will assist with handling needs, improving the reliability of clients' existing equipment and helping to choose new equipment. The quick response engineering team provide on-site consulting services in; Testing, Modelling, Functional design, Structural design, Equipment supply and Courses/seminars.

Jim Way Enterprise Co Ltd

No 17 Chang Tai Street
Lin Hai Industrial Park
Hsiao Kang Industrial
Kaohsiung 81266
Taiwan
Contact: Mr Danny Yang
Job Title:General Manager
T: + 886 7 8718126
F: + 886 7 8718128
E: jw@roller.com.tw
W: www.roller.com.tw

Professional manufacturer established in 1980. Specialize in fabrication of belt conveyor component parts, idler, pulley, belt cleaner, skirtings, impact & wear-resistant products. Has passed ISO 9001 certification, and have more than 22 years' experienc

Joy Mining Machinery

West Quay Road
Sunderland Enterprise Park East
Sunderland
Tyne & Wear SR5 2TD

UK
Contact: Mr Paul Bancroft
Job Title:Sales & Marketing Director
T: + 44 191 516 5353
F: + 44 191 516 5399
E: sales@continental-conveyor.co.uk
W: www.continental-conveyor.co.uk
Previously known as Continental Conveyor Ltd.

Kardesler Grab & Machine

Sultan Orhan Mah
Hasköy Sanayi Sitesi 11/B Blok No:24
Kocaeli / Gebze, KOCAELİ 41400
Turkey
Contact: Mr Huseyin Isikoglu
Job Title:Export Manager
T: + 90 262 6445018
F: + 90 262 6445017
E: kardesler@kardeslerkepce.com
W: www.kardeslerkepce.com and www.kardeslergrab.com
Established in Istanbul/Maltepe in 1985, KARDESLER GRAB AND MACHINE first produced grabs for sand. Now products are produced suitable for the needs of the modern age. The company considers quality service and customer satisfaction vital and happily serves clients both in Turkey and foreign countries. Today, to provide better service, clients are served out of its factory in Kocaeli/Gebze Haskoy.

Kinergy Corporation

7310 Grade Lane
Louisville
Kentucky 40219
USA
Contact: Mr Bill Ware
Job Title:Project Manager
T: + 1 502 366 5685
F: + 1 502 366 3701
E: bware@kinergy.com
W: www.kinergy.com
Manufacturer of vibratory machines for bulk solid material handling. Induced Vertical Flow units either discharge or densify materials placed in storage. Induced Conveying units use vibration to transport or process bulk solid materials.

King Bag & Manufacturing Co

1500 Spring Lawn Avenue
Cincinnati OH 45223
USA
Contact: Mr Mike Jennings
T: + 1 513 541 5440 ext 306
F: + 1 513 541 6555
E: mike@kingbag.com
W: www.kingbag.com
Manufactures FIBCs with 100 years of experience in the speciality bag business producing custom sewn products for customers around the world.

KIROW ARDELT GmbH

Heegermühler Straße 64
Eberswalde
Brandenburg 16225
Germany
Contact: Dr Wolfgang Melzer
Job Title:Managing Director
T: + 49 3334 62 2275
F: + 49 3334 62 2121
E: wolfgang.melzer@kranunion.de
W: www.ardelt.de
Specialist for bulk handling, founded 1902.
Range:
Double jib level luffing cranes; Double Jib level luffing cranes with integrated hopper; Single jib cranes; Balancer cranes; Mobile harbor cranes; Shipyard & Dock cranes.
Bulk handling performances upto 2.200 t/h.

KRANUNION GmbH

Spinnereistraße 13
Leipzig 04179
Germany
Contact: Ms Gabriela Schilk
Job Title:Marketing Department
T: + 49 341 49 53 212
F: + 49 341 49 53 125
E: gabriela.schilk@kranunion.de
W: www.kranunion.de
Kranunion is an association of three crane manufacturers specialised in lifting and transporting heavy loads. Kirow is the world market leader for railway cranes and slag pot carriers. Ardelt is the world market leader for double jib level luffing cranes. Kocks is the world market leader for Goliath cranes and innovator for STS container cranes.

Lachenmeier Monsun A/S

Grundtvigs Allé 176
Sønderborg 6400
Denmark
Contact: Mr Chrisitan Petersen
Job Title:Sales Director
T: + 45 74 42 24 64
F: + 45 74 43 04 04
E: mail@lachenmeier-monsun.com
W: www.lachenmeier-monsun.com

Laidig Systems Inc

14535 Dragoon Trail
Mishawaka
IN 46544
USA
Contact: Mr Mike Schuster
Job Title:Vice President
T: + 1 574 256 0204 x 236
F: + 1 574 256 5575
E: sales@laidig.com
W: www.laidig.com
Laidig Systems Inc, provides custom-engineered bulk storage and reclaim systems as well as silos and silo reclaimers for tough, hard to handle materials and whole grains. Such materials include soybean meal, other grain meals, whole grains, wood chips, sawdust, and recycled materials.

Langston Companies Inc.

PO Box 60
Memphis
Tennessee 38101-0060
USA
Contact: Mr Bob Langston
Job Title:President
T: + 1 901 774 4440
F: + 1 901 942 5402
E: blangston@langstonbag.com
W: www.langstonbag.com

Larox Flowsys Oy

Marssitie 1
PO Box 338
Lappeenranta FIN-53101
Finland
Contact: Ms Marjatta Kupias
Job Title:VP, Marketing
T: + 358 201 113 323
F: + 358 201 113 300
E: marjatta.kupias@larox.fi
W: www.larox.fi
Produces pinch valves and hose pumps for abrasive and aggressive conditions in various industries including mining, chemical, pulp and paper. For more information please contact the company in Finland or some of their representatives around the world.

Lawrence Industries, Inc.

10403 Arbor Trail
Fort Wayne
Indiana 46804
USA
Contact: Mr Kerry McAtee
Job Title:Sales Engineer
T: + 1 260 432 9693
F: + 1 260 432 6302
E: kmatee@lawrenceindustriesnow.com
W: www.lawrenceindustriesnow.com
Lawrence Industries, Inc. is a supplier of industrial lining materials that improve bulk material flow in silos, bins, and bunkers. TIVAR 88 is a primary material that is used to eliminate bridging, arching and ratholing. Lawrence Industries designs and fabricates.

Libran Engineering and Services

C-33, First Floor
Malviya Nagar
New Delhi 110 017
India
Contact: Mr Anil Seth
Job Title:Director
T: + 91 11 266 71658
E: libranengineering@gmail.com
W: www.libranengineering.com
Feasibility studies and development of conceptual layout includind tender preparation for grain terminal.

Librawerk Maschinenfabrik GmbH

Vossenkamp 1
Braunschweig
Lower Saxony D-38104
Germany
Contact: Mr Klein
T: + 49 531 370980
F: + 49 531 3709888
E: info@librawerk.de
W: www.librawerk.de
Fully automatic and semi-automatic bagging units for almost all kinds of bulk goods. Big bag filling machines with a weighing range of up to 2,000kg, with capacities from 5 to 60 bags/hour.

Liebherr Maritime Cranes

Dr. Hans Liebherr Str. 1
Nenzing A-6710
Austria
Contact: Mr Leopold Berthold
Job Title:Sales Director
T: + 43 50809 41725
F: + 43 50809 41447
E: mobile.harbour.crane@liebherr.com
W: www.liebherr.com
With over 35 years of experience in mobile harbour crane business, Liebherr offers today a range of 7 models (42 - 208 tonnes capacity), providing ideal solutions for the efficient handling of containers, bulk, general cargo and heavy lifts.

Listenow GmbH & Co.

Dieselstrasse 21
Rutesheim 71277
Germany
Contact: Mr Carsten Lohr
T: + 49 7152 50900
F: + 49 7152 509050
E: c.lohr@listenow.com
W: www.listenow.com
Loading equipment from 200-2000mm and length up to 24m, loading tubes - patented - PU flex, loading tubes of many materials, filter for loading equipment, electric rope winches, bellow expansion joints, collars, hoses, folding stairways, transport racks.

LogSys NV

Land Van Waaslaan 5
Haven 1213
Kallo B-9130
Belgium
Contact: Ms Sabine Berckmans
Job Title:Project Manager & Marketing/Sales
T: + 32 3 755 89 62
E: sberckmans@logsys.eu
W: www.logsys.eu
LGS.Stevedore is a Terminal Operating System for dry bulk, break bulk and multipurpose terminals, developed by LogSys. Next to LGS.Stevedore, Logsys also provides solutions for maintenance management, payroll management, customer portals, road transport management, ...

Macawber Engineering, Inc

1829 Clydesdale Street
Maryville, TN 37801-3796
USA
Contact: Mr John Bell
Job Title:Process Automation
T: + 1 800 433 2213
F: + 1 865 984 5286
E: macawber@macawber.com
W: www.macawberengineering.com
Specializing in low-velocity, dense-phase pneumatic conveying solutions and installations worldwide for over 30 years.

Mack Manufacturing Inc

PO Box 1559
7205 Bellingrath Road
Theodore
Alabama
36582
USA
Contact: Mr Matthew A. Davidson
Job Title:Vice President - Marketing
T: +1 251 653 9999
F: +1 251 653 1365
E: sales@MackMfg.com
W: www.mackmfg.com
A leader in designing and building heavy-duty high performance grapples and clamshell buckets since 1942. We are dedicated to supplying our customers with the right attachment for their application. Quality and reliability are trademarks of Mack grapples and buckets.

Mantsinen Group Ltd Oy

Valikankaantie 3
Ylamylly, FIN-80400
Finland
Contact: Ms Mia Mantsinen
Job Title: Sales and Marketing Director
T: + 358 20 755 1230
F: + 358 13 252 5555
E: jukka.hamalainen@mantsinen.com
W: www.mantsinen.com
Mantsinen Group manufactures highly efficient and precise hydraulic harbour cranes for bulk and general cargo operations. Mantsinen cranes can be tailored to best suit each application. Mantsinen HybriLift® energy saving system and wide range of attachments makes the cranes economical, efficient and universal tools for stevedoring companies and harbour operators.
Other equipment/expertise: Wood handling Log stackers, subcontracting.

Maquinas Condor SA

Av Dos Estados 1383
Porte Alegre
RS 90200-001
Brazil
Contact: Mr Carlos Roberto Fritsch
Job Title:Director
T: + 55 51 2104 3388
F: + 55 51 2104 3345
E: condor@maquinascondor.com.br
W: www.maquinascondor.com.br
Founded 1959. Engineers and manufactures complete systems for solid bulk materials handling ports and terminals. Equipment range includes pneumatic grain unloading, continuous shiploading, bulk stacking, reclaiming, belt coveyor, bucket elevator and mechanical conveyor. Operating from barges up to capesize ships, to 3000 tph. Shipunloaders and shiploaders operating successfully in ports around the world.

Martin Engineering

One Martin Place
Neponset
Illinois IL 61345
USA
Contact: Mr Greg Milroy
Job Title:Customer Service Manager
T: + 1 309 852 2384 ext 214
F: + 1 888 335 6811
E: info@martin-eng.com
W: www.martin-eng.com
Established in 1944, Martin is the leading developer, manufacturer and supplier of innovations to make the handling of bulk materials cleaner, safer and more productive. Martin offers technologies that boost flow, reduce dust and spillage, extend component life and reduce downtime, resulting in improved operations and profitability.

Martin Engineering GmbH

In der Rehbach 14
Walluf
D-65396

Germany
Contact: Mr Joachim Preiß
Job Title:Marketing Manager
T: + 49 61 23 978 221
F: + 49 61 23 75 5 33
E: julius.mueller@martin-eng.de
W: www.martin-eng.de
Conveyor belt cleaners, belt tracking systems, impact cradles, sealing systems , dust suppression systems, air cannons and vibrators, silo cleaning services , air supported conveying systems, inertial flow transfer chutes.

Martin Engineering South Africa

PO Box 12696
Leraatsfontein 1038
South Africa
Contact: Mr Hannes Kotze
Job Title:Managing Director
T: + 27 13 656 5135
F: + 27 13 656 5129
E: hannesk@martin-eng.co.za
W: www.martin-eng.co.za
Installation & Maintenance of belt cleaners, sealing systems, impact support, belt tracking, air-cannons, screen vibrators, silo cleaning, service contracts, Martin Engineering Service Group - MESG S Class air supported conveyors, Inertial Flow chutes.

Maschinen und Mühlenbau Erhard Muhr GmbH

Grafenstraße 27
Brannenburg
D-83098
Germany
Contact: Mr Roland Muhr
Job Title:Managing Director
T: + 49 8034 9072 26
F: + 49 8034 9072 526
E: info@muhr.com
W: www.muhr.com
MUHR offers a wide range of high quality Bulk Loading Systems (for open and closed, dust-free loading), Loading Spout Positioners, Pneumatical Docking Devices and even Railcar Dumping Systems for economical unloading of trains with open railcars.

Merrick Industries

10 Arthur Drive
Lynn Haven
FL 32444
USA
Contact: Mr Ron Selbe
Job Title:Sales Manager
T: + 1 850 265 3611
F: + 1 850 265 9768
E: info @merrick-inc.com
W: www.merrick-inc.com
Invented dynamic weighing in 1908 and has been operating continuously ever since. Offer carbon and stainless steel belt scales, weigh belt feeders, loss-in-weight feeders, volumetric feeders, flow meters and microprocessor controls. The company is focused on the dynamic weighing of powders, granules, pellets and liquids while in motion. Products are supplied worldwide and can be used in batching, continuous weighing and continuous feedrate control applications.

Metso Minerals Industries, Inc.

Bulk Materials Handling
4000 Town Center Boulevard
Suite 400
Canonsburg
PA
15317
USA
Contact: Mr Tom Lippencott
Job Title:VP Mining Capital Sales, USA & Canada
T: + 1 412 269 5137
F: + 1 412 269 5212
E: Tom.Lippencott@metso.com
W: www.metso.com
Products: Railcar and Barge Pullers, Railcar Dumpers and Positioners, Grab & Equilibrium Unloaders, En-Masse Conveyors, Ship Trimmers, Throwers, Railcar Indexers, Barge Haul Systems, Breasting Winches, Apron Feeders. Brand Names: Stephens-Adamson, McNally Wellman, PECO, Nolan HCM, MKT, Mead Morrison, McDowell Wellman, NICO

Midwest International Standard Products, Inc.

105 Stover Road/ PO Box 438
Charlevoix MI 49720
USA
Contact: Mr Walter Pair
Job Title:Director of Operations
T: + 1 231 547 4000
F: + 1 231 547 9453
E: sales@midwestinternational.com
W: www.midwestmagic.com
Founded in 1967 the company focuses on dust-free loading and stockpiling of dry bulk products. The Paragon Series and Heavy Duty Mining Series product lines have throughput capacities to 1400 STPH and 6000 STPH respectively and useful vertical travels to 45 feet and 100 feet. Chokefeeder dust-free shiploading systems are used by governments and industries in over 50 countries.

Mole•Master Services Corporation™

27815 State Route 7
Marietta
Ohio 45750
USA
Contact: Mr David Laing
Job Title:General Manager
T: + 1 740 374 6726
F: + 1 740 374 5908
E: contactus@molemaster.com
W: www.molemaster.com
Silo, bin, bunker and process vessel cleanout & unclogging services and equipment. Pipe cleaning, Vacuum services, Dry ice Blasting, Media Blasting, Silo structural inspection services and Equipment cleaning.

MRS Greifer GmbH

Talweg 15-17
Helmstadt-Bargen D-74921
Germany
Contact: Mrs Karin Greulich
Job Title:Export Manager
T: + 49 7263 912 915
F: + 49 7263 912 912
E: export@mrs-greifer.de
W: www.mrs-greifer.de
Approaching 40 years experience in producing all types of grabs. The company's product range extends from mechanical grabs, also radio-controlled, to hydraulic and electro-hydraulic grabs with motor drives. Besides excellent after-sales service, MRS provide spare parts from stock.

Mühlen Sohn GmbH & Co. KG

P.O. Box 1165
Blaustein D-89130
Germany
Contact: Mrs Karin Albrecht
Job Title:Sales Manager Fluitex
T: + 49 7304 801 33
F: + 49 7304 801 23
E: albrecht.karin@muehlen-sohn.de
W: www.muehlen-sohn.de
Mühlen Sohn GmbH & Co. KG is one of the leading suppliers of fluidising fabrics and looks back to a success story since 1880 which means over 130 years of weaving experience.
Fluitex® air slide fabrics for pneumatic loading and unloading systems, airslides for pneumatic conveying, storage and homogenising silos, discharging cones, fly ash handling systems.

Muller Beltex BV

Ambachtsweg 28A
Pijnacker 2641 KS
The Netherlands
Contact: Mr Frits Muller
T: + 31 15369 5444
F: + 31 15369 7864
E: info@mullerbeltex.com
W: www.mullerbeltex.com
Other Equipment: Elevators. Specialists in elevator components, buckets belts ATEX conform safety monitoring equipment. Design engineering and problem solving.
Elevator belt bolt hole punching up to 2000 mm width
Specialist in abrasion resistant polyurethane liners.

NAVCO (National Air Vibrator Co)

PO Box 40563
Houston, TX 77240-0563
USA
Contact: Mr. Trey Gros
Job Title:Marketing
T: + 1 832 467 3636
F: + 1 832 467 3800
E: trey@navco.us
W: www.navco.us
Manufacturer of high quality, industrial grade air vibrators and vibratory equipment. NAVCO is the leading expert in material flow solution using industrial vibrators and vibratory equipment.

Nectar Group Ltd

No 1 Ashton Gate
Ashton Road
Harold Hill
Romford
Essex RM3 8UF
UK
Contact: Mr Guy Wilkes
Job Title:Commercial Director
T: + 44 1708 386 555
F: + 44 1708 386 665
E: nectar.uk@nectargroup.net
W: www.nectargroup.net
Nectar is involved in handling bulk commodities such as cereals and fertilizers in ports and/or inland locations. Involvement ranges from positioning of mobile bagging machines for spot cargoes to long term projects including terminal management and storage and logistics solutions.

Negrini Srl

via E. Torricelli n.4
Castelfranco Emilia
Modena 41013
Italy
Contact: Mr Rossetti Alessandro
T: + 39 059 923110
F: + 39 059 920378
E: info@negrini.org
W: www.negrini.org
Negrini srl considers the attainment of client satisfaction our primary objective, through a continuous and effective process of study and collaboration with both clients and suppliers. Professionalism and versatility towards different customer demands: this is the business philosophy of Negrini srl.

Nemag BV

Deltastraat 15
PO Box 110
Zierikzee
4300 AC
The Netherlands
Contact: Mr Riny Stoutjesdijk
Job Title:Sales Manager
T: + 31 111 418 900
F: + 31 111 416 154
E: sales@nemag.com
W: www.nemag.com
NEMAG specializes in sales and manufacture of tailormade mechanical grabs. Also rope end fittings like the NEMAG Rope Pear Socket and NEMAG Quick Release Link. NEMAG is one of the leading grab manufacturers world wide.

NERAK GmbH Fördertechnik

Brigitta 5
Hambühren D-29313
Germany
Contact: Mr Edgar Bleeker
Job Title:Marketing
T: + 49 50 84 944 0
F: + 49 50 84 944 222
E: bleeker@nerak.de
W: www.nerak.com
Conveying on combined horizontal/vertical paths is our strength. The NERAK rubber block chain is the basis for the world wide success of NERAK conveyors: reliable, nearly maintenance free, without any lubrication and very silent, operating in various industries.

Neuero Industrietechnik GmbH

Neuerostrasse 1
Melle, D-49324
Germany
Contact: Eng Andreas Haeuser
Job Title:Sales & ProjectManager
T: + 49 5422 9503 26
F: + 49 5422 9503 50
E: ha@neuero.de
W: www.neuero.com
NEUERO offers a wide range of pneumatic conveyors and unloaders from 10tph to 1,000tph. Mechanical ship unloaders up to 1,200tph and solution systems for loading ships to 3,000tph. Product varies from grain to alumina and biomass. Special unloading systems with rotating feeder for non free flowing materials like biomass or feedstuff. Environmental friendly and operation safe.

Nilfisk-CFM SpA

Via Porrettana 1991
Zocca
Modena 41059
Italy
Contact: Dr Leonardo Bianco
Job Title:Marketing Manager
T: + 39 059 973 00 31
F: + 39 059 973 00 99
E: info@nilfisk-cfm.com
W: http://www.cfm.it/
CFM SpA is world leader in the production of industrial vacuums, pneumatic conveyors, centralized vacuum systems and high power vacuums (Spirovac).

NKM Noell Special Cranes GmbH

Postbus 638
Hoofddorp 2130AP
The Netherlands
Contact: Mr Enno Kramer
Job Title:Director Product Unit Offshore Cranes
T: + 31 20 655 0030
F: + 31 20 655 0040
E: enno.kramer@nkmnoell.com
W: www.nkmnoellspecialcranes.com
Leading manufacturer of lemniscates cranes and special equipment for the bulk industry. Turn key project capability; design, manufacturing and erection in-house. Our maintenance division provides added value service for refit, modernisation and redesign for increased performance.

Nordströms Konstruktionsbyrå

Storgatan 58
Umeå SE-903 30
Sweden
Contact: Mr Peter Vedin
Job Title:Marketing
T: + 46 90 1136 4500
F: + 46 90 1330 69
E: arletun@nordstroems.se
W: www.nordstroems.se
The company, established 1981, is a supplier of turnkey plants and custom-made equipment for general dry bulk solids and aggregate material handling. The product portfolio includes belt and worm conveyors; telescopic loading chutes; weighing scales; silos, bins and hoppers; feeders and valves. Machines are parametrically adjusted to meet individual client's needs on terms of specifications and capacities.

Nordstrong Equipment Ltd

400 Ambassador Drive
Mississauga
Ontario L5T 2J3
Canada
Contact: Mr Bill Van Duyn
Job Title:Sales Manager
T: + 1 289 562 6402
F: + 1 289 562 6445
E: wmvanduyn@nordstrongequipment.com
W: www.nordstrongequipment.com
Provides range of material

handling equipment including belt, drag, screw and pipe conveyors and bucket elevators.

Orthos Projects Ltd.

Fernie Road
Market Harborough
Leicestershire LE16 7PH
UK
Contact: Mr Nick Hall
Job Title:Director
T: + 44 1858 462806
F: + 44 1858 464403
E: nick.hall@orthosprojects.com
W: www.eandfservices.com; www.orthosprojects.com
Orthos Projects, specialists in bulk materials handling, have taken over the operation of E&F services. Their Dockside Mobile Loaders have gained a technological lead in eliminating spillage and controlling dusty products from Ports operations. Their range of Filters eliminate pollution.

ORTS GmbH Maschinenfabrik

Schwartauer Strasse 99
Sereetz D-23611
Germany
Contact: Herr Sigvard Orts
T: + 49 451 3988515
F: + 49 451 392374
E: soj@orts-gmbh.de
W: www.orts-grabs.de
Whole range of grabs for all kind of bulk materials, dredging and scrap handling: mechanical single,- 2- and 4-rope grabs, electro- hydraulic grabs, radio controlled diesel- hydraulic grabs, repair and overhauling of grabs. All "Made in Germany".

Page Macrae Engineering

61 Aerodrome Road
Mount Maunganui
Bay of Plenty 3116
New Zealand
Contact: Mr Bruce Ennis
Job Title:Cargo Handling Equipment Manager
T: + 64 7 575 5079 Ext 810
F: + 64 7 574 8594
E: brucee@page-macrae.co.nz
W: www.page-macrae.co.nz
With over 50 years of engineering experience behind it, Page Macrae Engineering is regarded as Australasia's leading manufacturer of ship cargo handling equipment. They have commanded a reputation for delivering high quality equipment that is robust, low maintenance and highly productive, regardless of conditions and loads.

PAM Poul Andersen Maskinfabrik A/S

Vejlevangen 5
Kerteminde DK - 5300
Denmark
Contact: Mr Erik Andersen
Job Title:Director
T: + 45 65 32 12 41
F: + 45 65 32 43 53
E: pam@pam.dk
W: www.pam.dk
PAM is a privately owned family company which was founded in 1935. PAM produces pneumatic conveying units. Mobile suction units 100-150 t/h or suction blowing units 100-120 t/h, with diesel engine or electric motor.

Paul Hedfeld GmbH

Hundeicker Strasse 20
Gevelsberg 58285
Germany
Contact: Mr Burkhard Hedfeld
T: + 49 2332 6371
F: + 49 2332 61167
E: hedfeld@hedfeld.com
W: www.hedfeld.com
The company has produced complete installations for over 60 years for the transport of bulk goods such as bucket elevators, screw- and chain conveyors. The delivery of spare parts used in these conveyors was and is the basis of the current business.

Pavan Group Srl

Via Monte Grappa, 8
Galliera Veneta (PD), 35015
Italy
Contact: Ms Monica Giantin
T: + 39 049 942 3111
F: + 39 049 942 3303
E: marketing02@pavan.com
W: www.pavan.com

PEBCO®

PO Box 7506
225 North 4th Street (42001)
Paducah, KY 42002-7506
USA
Contact: Mr David Finke
Job Title:VP, Sales and Marketing
T: + 1 270 442 1996
F: + 1 270 442 5214
E: sales@pebco.com
W: www.pebco.com
PEBCO® is recognized world-wide as the leading manufacturer of powder and dry bulk solids handling equipment. Products range from truck, train, and ship loading equipment to gates, valves, diverters, mass flow feeders, Cascade® and dustless loading chutes.

Peiner Smag Lifting Technologies GmbH

Windmühlenbergstrasse 20-22
Salzgitter D-38259
Germany
Contact: Mr Arnulf Köhnemann
T: + 49 5341 302 613
F: + 49 5341 302 424 or 606
E: arnulf.koehnemann@peiner-smag.com
W: www.peiner-smag.de
Manufacturer and supplier of a complete range of grabs, ie (electro-hydraulic) motor grabs, single-rope grabs, two- and four-rope grabs, hydraulic grabs as well as rotators (slewing units) and special grabs for all kinds of bulk materials for various applications and purposes.

Peterson Agricare & Bulk Logistics BV

Boompjes 270
Rotterdam 3011 XZ
The Netherlands
Contact: Mr Arno Maehlmann
T: + 31 10 282 3333
F: + 31 10 282 3282
E: info@peterson.nl
W: www.peterson.nl
Offers a wide range of logistic, inspection, laboratory and certification services in agribulk commodities, mineral bulk commodities, chemicals, biomass and biofuels. Complete supply chain covered from origin to destination.

Pfister Waagen Bilanciai GmbH

Linker Kreuthweg 9
Affing-Mühlhausen D-86444
Germany
Contact: Ms Susanne Geller-Dürr
Job Title:Marketing and Sales Manager
T: + 49 82 07 9 58 99 28
F: + 49 82 07 9 58 99 29
E: marketing@pfisterwaagen.de
W: www.pfisterwaagen.de
Truck weighbridges, railway scales, platform scales, crane scales, weighing data management software, load cells, load cell units, weighing indicators.

PHB Weserhütte, S.A.

Parque Científico y Tecnológico de Gijón
C/Luis Moya Blanco 82
Gijón
Asturias 33203
Spain
Contact: Dr Jose Ramón Prado
Job Title:Technical Commercial Director
T: + 34 985 13 41 71
F: + 34 985 13 42 22
E: joseramon.prado@pwh.es
W: www.pwh.es
PHB Weserhütte, has over 50 years' experience and its own "know how" in the area of materials handling. The company has vast experience in the development of Turnkey Projects in the sectors of energy, cement, ports, iron and steel, fertilisers, mining and industrial plants.

Phenix Rousies Industries

Rue de Maubeuge
Rousies 59131
France
Contact: Mr Frederic Lepretre
Job Title:Export Sales Manager
T: + 33 03 27 69 42 42
F: + 33 3 27 64 95 85
E: lepretre.export@silos-phenix.com
W: www.silos-phenix.com
Produces dust control covers for belt conveyor systems and grain storage silos fitted with integrated gantry and aeration systems.

Pirs SAS

ZI St Hermentaire
309, Avenue de l'Europe
Draguignan, Var 83300
France
Contact: Mr Fikri El Mourabet
Job Title:International Sales Manager
T: + 33 4 98 10 6767
F: + 33 4 98 10 6768
E: info@domepirs.com
W: www.domepirs.com
Specialists in the construction of reinforced concrete dome storage for bulk products. Storage capacity can reach up to 100,000 tons depending on the product. The company has built more than 100 domes worldwide and provide engineering, materials, supervision construction and turnkey projects.

Plantragg Developments

4 Wold View
Caistor
Lincoln
Lincolnshire
LN7 6UU
UK
Contact: Mr Bob Harrison
Job Title:Director
T: + 44 1472 852 498 or + 44 7973 832 741
F: + 44 1472 852 498
E: ptag.dev@talktalk.net
W: www.plantragg.co.uk
The company has 14 years experience with the removal of 'hung' cargoes from bulk carrier frames with their 'Vibrorig' patented device, ideally suited to be mounted on a telescopic handler, which in its own right is a very useful machine to be used on other duties. Ship Trimming Aid "Vibrorig" patented equipment to facilitate fantastic improvements to ship turnround and terminal throughput.

PLM Cranes B.V.

Sluisweg 21-25
Heijningen
4794 SW
The Netherlands
Contact: Mr Pieter Pulleman
Job Title:Managing Director
T: + 31 167 528510
F: + 31 167 524444
E: info@plmcranes.com
W: www.plmcranes.com
We build hydraulic and electric cranes from 50 to 2000 tm with a transhipment capacity up to approx. 2000 ton/hour. We are specialized in shipboard cranes, mobile cranes and harbour cranes for dredging, transhipping, hoisting and pile-driving.

Polymer Industries - Ultrapoly Division

2404 Center Street
Tacoma, WA 98409-7638
USA
Contact: Mr Bryan Olin
T: + 1 253 272 1217
F: + 1 253 272 1457
E: bryan.olin@polymerindustries.com
W: www.polymerindustries.com
Other equipment: wear and liner components.
UHMWPE and other olefins for impact, wear and flow applications.

Portpack UK Limited

Unit A2/G11 Enterprise Business Park
Wigwam Lane
Hucknall
Nottinghamshire NG15 7SZ
UK
Contact: Ms Sharon Henson
Job Title:General Manager
T: + 44 1159 680130
F: + 44 1159 641926
E: portpack@portpack.biz
W: www.portpack.biz
Portpack design and manufacture containerised Mobile Bagging Systems for the direct discharge of bulk carriers in the port of arrival, with materials weighed and bagged at dockside, filled sealed bags are loaded directly onto trucks for onward distribution or delivery.

Port-Trade ApS

Karetmagervej 9
Fredericia DK 7000
Denmark
Contact: Mr Peter J Muller
Job Title:Sales Manager
T: + 45 7628 0102
F: + 45 7628 0103
E: peter.muller@port-trade.com
W: www.port-trade.com
Sales and service in Scandinavia of harbour cranes, grabs, containerspreaders, loaders, reclaimers etc.

Powertex Inc

1 Lincoln Boulevard
Rouses Point
New York. NY12979
USA
Contact: Mr George Bombardier
Job Title:Vice President Sales and Marketing
T: + 1 518 297 4000
F: + 1 518 297 2634 / 2242
E: georgebombardier@powertex.com
W: www.powertex.com
Powertex is a market leader in the dry bulk container liner market, with its Sea Bulk container liner system for 20' and 40' ocean containers. Powertex assist clients through Project Management, with Logistics and with Loading and Discharge Equipment - supplying equipment specifically designed for the use of bulk container liners.

Precia-Molen Nederland BV

Franse Akker 1
Breda 4824 AL
The Netherlands
Contact: Mr Frédéric Felten
Job Title:Export Manager
T: + 31 76 524 2510
F: + 31 76 522 8039
E: export@preciamolen.nl
W: www.preciamolen.nl
For almost 150 years Precia Molen is specialized in industrial weighing equipment such as weighbridges, hopperscales, baggingscales, platformscales, truckdumpers etc.

Premier Tech Chronos B.V.

Meerheide 40
Eersel
Noord Brabant 5521 DZ
The Netherlands
Contact: Mr Ingo Jonas
Job Title:General Manager
T: + 31 497 514 988
F: + 31 497 514 953
E: info-eu@ptchronos.com
W: www.ptchronos.com
PREMIER TECH CHRONOS (PTC) is recognized worldwide for its innovative and customized packaging, material handling and bulk processing solutions. We are driven by innovation: we developed several state-of-the-art technologies which are still in the lead to

Premier Tech Chronos GmbH

Löhestrasse 18
Hennef 53773
Germany
Contact: Mr Robert Oster
Job Title:Geschäftsführer
T: + 49 2242 9335 0

F: + 49 2242 9335 186
E: info-eu@ptchronos.com
W: www.ptchronos.com
PREMIER TECH CHRONOS (PTC) is recognized worldwide for its innovative and customized packaging, material handling and bulk processing solutions. We are driven by innovation: we developed several state-of-the-art technologies which are still in the lead today. Our prime objective is to meet your packaging needs in the most creative and efficient way.

Premier Tech Chronos Ltd

Unit 1, Centurion Business Centre
Blenheim Industrial Estate
Nottingham
Notts NG6 8WN
UK
Contact: Mr Peter Orm
Job Title:General Manager
T: + 44 115 935 1351
F: + 44 115 960 6941
E: info-eu@ptchronos.com
W: www.ptchronos.com
PREMIER TECH CHRONOS (PTC) is recognized worldwide for its innovative and customized packaging, material handling and bulk processing solutions. We are driven by innovation: we developed several state-of-the-art technologies which are still in the lead today. Our prime objective is to meet your packaging needs in the most creative and efficient way.

Premier Tech Chronos S.R.L.

Via G. Di Vittorio, 78
Lemignano Di Collechio
PG 43044
Italy
Contact: Mr Fabrizio Ferrari
Job Title:General Manager
T: + 39 521 29 60 11
F: + 39 521 29 60 51
E: info-eu@ptchronos.com
W: www.ptchronos.com
PREMIER TECH CHRONOS (PTC) is recognized worldwide for its innovative and customized packaging, material handling and bulk processing solutions. We are driven by innovation: we developed several state-of-the-art technologies which are still in the lead today. Our prime objective is to meet your packaging needs in the most creative and efficient way.

Primasonics International Limited

North Lakes Business Park
Flusco
Penrith
Cumbria
CA11 0JG
UK
Contact: Mr Donald Cameron
Job Title:Managing Director
T: + 44 17684 80372
F: + 44 17684 80374
E: sound@primasonics.com
W: www.primasonics.com; www.quattrosonics.com
Primasonics designs and manufactures a range of Audiosonic Acoustic Cleaners which are used to de-bond powders allowing free flow of material. Wherever ash, dust, powders or granular material is processed, stored, generated or transported.

Procon Engineering Limited

Vestry Estate
Otford Road
Sevenoaks
Kent TN14 5EL
UK
Contact: Mr Joe Naylor
Job Title:Sales Manager - Beltweighers
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Manufactures belt weighers for process control and trade use in the grain industries. Weighing systems for grain have been produced with capacities as low as 2t/h and as high as 2,000t/h. (In other materials the company has machines as high as 12,000t/h. Many single sites trade over GBP£100 million per annum over their Procon Inflo trade approved belt weighing systems.

PT. Bando Indonesia

Wisma Hayam Wuruk, 6th floor, Suite 600
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PT. Bando, established in 1987, is one of the leading automotive and industrial power transmission belt manufacturers in Indonesia. It has one main plant located in Tangerang and its marketing office located in Central Jakarta.

Quadrant Engineering Plastics Products

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With more than 40 years experience, Quadrant EPP's SystemTIVAR® Engineering designs, fabricates and installs lining systems worldwide for use in hoppers, chutes, bins, dump bodies, railcars, ships, etc., featuring industry-leading low coefficient of friction, abrasion-resistant TIVAR® 88 family of products.

R & S S.r.L.

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Design and build wide range of equipment for bulk handling material. Pneumatic ship unloaders, mechanical ship loaders (bulk and bags), grab loading hoppers (dust free) conveyor belt, bucket elevators and chain conveyors. Rotary valves, Screw conveyors, diverters, telescopic bellows.

Rapat Asia

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RBL-REI France

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Designs, builds and supplies continuous bulk handling belt conveyor systems and associated equipment, stackers up to 10,000 tph, reclaimers up to 15,000 tph and shiploaders up to 3,000 tph.

RDS Technology

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RDS specialises in the design and manufacture of electronic instrumentation including on-board weighing systems for loaders operating in grain and animal feed applications enhancing operational efficiency. The range includes the Weighlog a10, Weighlog 200 and Loadmaster iX series.

Redler® (Schenck Process Group)

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Schenck Process Group provides innovative solutions for the handling and storage of bulk materials using pneumatic and mechanical conveying technologies together with weighing, feeding and air filtration equipment to give a comprehensive package of products and services.

REMA TIP TOP GmbH

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World leader in high-quality conveyor maintenance, wear protection and corrosion prevention. Provides products, accessories, technical consultancy and customized problem solving solutions in over 170 countries. Equipment range – rubber linings for wear protection; rubber repair material for conveyor belts; pulley laggings; corrosion protection linings; coating and bonding systems.

RHC Deutschland GmbH

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RHC is a German company with engineering and manufacturing facilities in Europe and Asia.

River Consulting

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River Consulting delivers EPCM material handling experience, including project management, design/supply of conveying systems and engineering. With 30 years of experience, we provide proven solutions including blending, conveying, silo and stacking tubes automation and controls, and marine structures.

Robson Handling Technology

Geo. Robson & Co. (conveyors) Ltd.
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Design and Manufacture and Install Bulk Handling Systems including Belt, Screw and Chain Conveyors, Elevators, Hoppers, Vibros and Feeders. Steelwork and Supports. Individual units or Turn Key Projects.

Ronin GMS

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With knowledge and experience in the development of modern ports and (un)loading, transport and storage systems, high quality advice and comprehensive project management is provided in the field of grain and other dry bulk handling. Clients' objectives vary from increasing capacity, operational efficiency and handling speed to shifting from road to rail or inland water transport. From pre-investment studies and conceptual design to construction management, practical, sustainable and cost-effective engineering solutions are offered.

RTA Alesa Ltd.

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W: www.rta-alesa.com
Specialised in dry bulk materials handling system for port terminals and plant, travelling pneumatic ship unloaders >600 t/h, storage systems, truck/railcar loading unloading systems, all kind of pneumatic conveying system (incl. dense phase, dilute phase, airlifts, airslides, suction systems), belt and tube conveyors, bath plant & carbon recycling plant, which includes for crushers, electrolysis pot control system, engineering services for all project activities above including civil and structural.

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Designs, manufactures and installs bulk storage and general storage buildings from 3m span to 100m span. Supply structures for storage of all types of cargo, from coal and grain to salt. The structures are totally prefabricated and relocatable, are maintenance free and the fabric has a life expectancy of up to 25 years depending on usage.

RULMECA HOLDING S.P.A.

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The RULMECA Group specializes in the production of rollers, motorized pulleys and other components (such as stations, suspended garland sets and covers) for bulk material handling applications. It is composed of 10 manufacturing units, 7 sales companies and 2 representative offices and employs more than 1100 people + temporary workers.

SAMSON Materials Handling Ltd

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The core competencies lie in weighing sensors (load cells), display units (indicators) and complex process control (system controllers) for industrial use. Its customers primarily operate in the chemicals, pharmaceuticals, construction materials, food and other industries.

Schenck Process UK Ltd T/A Redler

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Scorpio Engineering Pvt. Ltd

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The company engineers and manufactures a complete range of grain handling equipment with turnkey engineering capability. Capacities of equipment range from a few tonnes per hour to about 500mt per hour. Key strengths are the ability to engineer, manufacture, install and commission complete grain terminals for ports and grain storage and handling systems for large grain processors.

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Design and build contractors involved with ports, self-unloaders and transshippers for bulk cargo. The firm provides turn-key logistics solutions for the transportation, storage and handling of bulk materials, prototype new developments including material handling systems for ship and open-sea transshipment.

S-E-G Instrument AB

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Sempertrans Marketing
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W: www.sempertrans.com
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Servo Berkel Prior

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Shanghai Janus Grab Co., Ltd.

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Develops high-tech grabs, such as motor hydraulic bulk grab, motor hydraulic orange peel grab, wireless remote control bulk grab and contractible single rope bulk grab. Also manufactures a variety of handing tools, loading and unloading equipment, steel structure frame and other mechanical products.

Shanghai Zhenhua Port Machinery Co (ZPMC) Ltd

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SMB International GmbH

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Discharge aids for storage silos.

Sotecma Inc Process Engineers

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Canadian company offering turnkey engineering and construction services in bulk handling and flat storage solutions at low cost. The type of structure used is a highly versatile alternative to conventional constructions. The storage shed can be dismantled and be relocated. For more details visit www.sotecma.com.

STAG AG

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Stas BV

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Stas is a manufacturer (production) of transport rollers, drive and tension drums and import bearings and bearing blocks.

Stewart Inspection and Analysis (Pty) Ltd

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Strudes Inc. is an Engineering Consulting Company, specializing in design for heavy industry in general and Cement Industry in particular. For markets and more information: www.strudes.ca.

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Suomen Viljava Ltd is Finland's biggest grain handling and storage company. We have stores at 21 locations in south and middle Finland. The total storage capacity is 1,4 million tonnes. Our services comply with ISO 9001 and GTP standards.

Supercargo, Lda

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Worldwide system supplier of hydraulic braking solutions of material handling.

Swire CTM Bulk Logistics

C Transport Maritime SAM
Gildo Pastor Centre
7 Rue du Gabian
Monaco
MC 98000
Monaco
Contact: Captain Giorgio Vallega
Job Title:Operation/Commercial Manager
T: + 377 9798 5981
F: + 377 9798 2306
E: gvallega@ctmmc.com
W: www.swirectmbl.com
Sums up the experience, know-how and networks of its parent companies in the dry bulk and logistics field, providing a full range of integrated services from the supplier to the end users, including specialised barge services, transshipment, river, coastal and ocean transportation by means of conventional bulkcarriers or self-unloading vessels and barge.

TAIM WESER, S.A.

Carretera de Castellón, km 6,3
Polígono Industrial La Cartuja
Zaragoza
50013
Spain
Contact: Mr Simon Whalley
Job Title:Sales Director
T: + 34 976 500 006
F: + 34 976 500 028
E: info@taimweser.com
W: www.taimweser.com
TAIM WESER is a solid industrial organization, present in 59 countries and able to guarantee, with over 100 years of experience, the development and execution of any project related to its lines of manufacture: bulk handling, lifting, waste treatment and renewable energies.

TBMA Europe BV

Delfweg 18
Noordwijkerhout
NL-2211 VM
The Netherlands
Contact: Mr E A J Houben
Job Title: Managing Director
T: + 31 252 37 50 68
F: + 31 252 37 54 36
E: info@tbma.com
W: www.tbma.com/engels/
Systems and Components for dry Solids Handling. Pneumatic and mechanical conveying, rotary valves, diverter valves, sampling equipment, bellow feeders, Big-Bag filling and discharging equipment, dosing feeders, silo discharge equipment etc.

TBS Shipping Services

612 Grassy Sprain
Yonkers
New York
10710
USA
Contact: Mr Gregg McNelis
T: + 1 914 961 1000
F: + 1 914 961 2286
W: www.tbsship.com/

Tebodin Consultants & Engineers

Postbus 433
Deventer
7400 AK
The Netherlands
Contact: Mr Bert Frowijn
Job Title:Branch Director
T: + 31 570 63 8900
F: + 31 570 63 6350
E: b.frowijn@tebodincce.nl
W: www.tebodincce.nl
Tebodin CCE is a successful team of technical consultants and engineers with international reputation in the field of design, engineering, tendering, and implementation of andustrial as well as utility projects. A structured and decisive project approach results in high efficiency.

techNaero aps

Blaabaervej 3
Haslev
DK-4690
Denmark
Contact: Mr Anders Larsen
Job Title:CEO
T: + 45 56314925
F: + 45 56314555
E: sales@techNaero.dk
W: www.techNaero.dk
Other Expertise: Pneumatic transport systems. Supply of complete, high quality, low cost, professional dust removal systems according to ATEX. Efficient round filters. Spotfilters to removal from transferpoints. Pit-intake filters for discharge from trucks, railcars and around crane hoppers. Complete projects for Pneumatic Transport.

Telestack Limited

Omagh
County Tyrone
BT79 0NZ
Northern Ireland
Contact: Mrs Samantha Thompson
Job Title:Marketing Co-Ordinator
T: + 44 28 82 25 11 00
F: + 44 28 82 25 22 11
E: salesenquiries@telestack.com
W: www.telestack.com
Telestack Limited specialize in the design, manufacture, installation and commissioning of MOBILE bulk material handling solutions for the Ports & Inland Terminals, including a range of ship-loaders / Ship Un-loaders, mobile truck un-loaders, link conveyors and hopper feeders.

Terex Port Solutions

Gottwald Port Technology GmbH
Forststrasse 16
Düsseldorf
D-40597
Germany
Contact: Mr Giuseppe Di Lisa
Job Title:Vice President Sales & Service
T: + 49 211 7102 3771
F: + 49 211 7102 3651
E: tps.info@terex.com
W: www.terexportsolutions.com
Offers a wide range of mobile harbour cranes including professional four-rope grab cranes with lifting capacities ranging to 120 tonnes and radii up to 56m. Comprehensive customer support services including spare parts stocks, field service, full service contracts and a 24-hour call-out.

Teta Mühendislik A. .

Çankırı Yolu 7.km Aselsan Karşısı
Akyurt
Ankara
06950
Turkey
Contact: Mr Talat Isik
Job Title:General Manager
T: + 90 312 8475361
F: + 90 312 8475399
E: teta@tetamuh.com.tr
W: www.tetamuh.com.tr
Provides engineering, representation, manufacturing and erection of industrial equipment and plants for storage, handling and weighing, as well as bagging and loading of wide ranging bulk products.

The Grab Specialist B.V.

Draaibrugweg 1
Almere
1332AA
The Netherlands
Contact: Mr Emiel Bleyenberg
Job Title:Director
T: + 31 365 32 88 22
F: + 31 365 49 99 22
E: info@tgs-grabs.nl
W: www.tgs-grabs.nl
The Grab Specialist B.V. design, develop and manufacture grabs for the dry bulk cargo-, dredging- and recycling industry. A service-oriented company, complying with the highest standards of after-sales and spare part supply service to secure productivity in your operations.

Thermo Fisher Scientific

501 - 90th Avenue NW
Minneapolis
MN
55433
USA
Contact: Ms Paula Frisk
Job Title:Product Manager/Marketing
T: + 1 800 445 3503
F: + 1 763 783 2525
E: Sales.bulk.us@thermofisher.com
W: www.thermoscientific.com/bulkweighing
Thermo Scientific's Bulk Weighing & Monitoring product line includes conveyor belt scales, weighbelt feeders, impact weighers, sampling systems, numerous level indication devices, flow/no flow indicators, speed switches.

ThyssenKrupp Canada

1177-11th Avenue SW
Suite 500
Calgary
Alberta
2TR 1K9
Canada
Contact: Mr Steve Harrington
Job Title:Vice President Marketing
T: + 1 403 209 4431
F: + 1 403 245 5625
E: infocanada@thyssenkrupp.com
W: www.krupp.ca
Involved in the design and supply of turnkey mining and bulk materials handling projects. The product line of equipment encompasses shiploaders/ship unloaders, conveying systems, crushing systems, stackers, storage and reclamation systems.

ThyssenKrupp Industrial Solutions AG

Business Unit Materials Handling
Ernst-Heckel-Strasse 1
St Ingbert-Rohrbach
Saarland
D-66386
Germany
Contact: Dr W Ye
Job Title:Vice President Sales
T: + 49 6894 599 0
F: + 49 6894 599 468
E: info-mh@thyssenkrupp.com
W: www.thyssenkrupp-resource-technologies.com
Besides individual items of machinery as listed above, ThyssenKrupp Resource Technologies design and supply complete material handling plants turn-key.to the fertilizer industry (for handling of urea and phosphates etc.), the cement and mining industry, coal handling systems for power stations as well as complete port handling solutions.

ThyssenKrupp Robins, Inc.

7730 E. Belleview Ave
Suite #404
Greenwood Village
Colorado
80111-5820
USA
Contact: Mr Bill Halley
Job Title:Mechanical Engineer
T: + 1 303 770 0808
F: + 1 303 770 4522
E: bill.halley@thyssenkrupp.com
W: www.krupprobins.com
Located in Denver, Colorado the company ahs been involved for many years in the design and supply of turnkey, environmentally sensitive mining and material handling projects. The product line of equipment includes: conveying systems; crushing systems; stackers; shiploaders and ship unloaders; storage and reclamation design and supply.

Tideworks Technology - Europe

Maaswijkweg 7
Spijkenisse 3203 LG
The Netherlands
Contact: Mr Rik Verspeek
Job Title:Business Manager
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F: + 31 181 668660
E: info@tideworks.com
W: www.tideworks.com

Timars Svets & Smide AB

Industrivagen 12
Falkenberg
S-311 33
Sweden
Contact: Mr Peter Stenbeck
T: + 46 346 82100
F: + 46 346 82800
E: info@timars.se
W: www.timars.se
Sweden based company specialising in bag handling equipment. The company builds filling as well as discharge machines for big sacks and also design complete production lines with equipment and education.

TMSA Tecnologia em Movimentação S/A

Bernardino Silveira Pastoriza, 710
Bairro Sarandi
Porto Alegre
RS
91160-310
Brazil
Contact: Ms Zulmira Gorete
Job Title:Marketing
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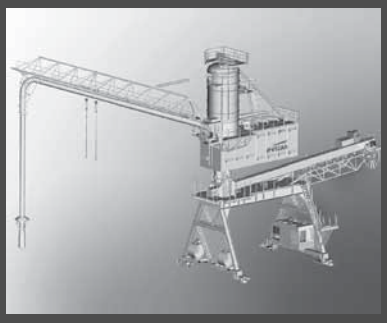
F: + 55 51 2131 3330
E: marketing@tmsa.ind.br
W: www.tmsa.ind.br
TMSA: one of the main suppliers in South American market for bulk solids material handling, especially in port terminals and industrial applications. Offers unique heavy duty, high capacity cleaning/screening machine, ship-loaders and dust control systems. Manufacturing with large highly integrated engineering under ISO 9001:2000 Certification.

VIGAN

Pneumatic or Mechanical
Ship Loaders & Unloaders
Port Equipment - Turnkey Projects

NIV: up to 800 tons/hour
Average efficiency 75%-80%

All types of grain



A win-win solution
between customer expertise and VIGAN know-how

VIGAN Engineering S.A. Rue de l'Industrie, 16 ▸ 1400 Nivelles (Belgium)
Tél.: +32 67 89 50 41 ▸ Fax : +32 67 89 50 60 ▸ www.vigan.com ▸ info@vigan.com

Tramco Europe Limited
Mandham Business Park
Hull Road
Hull
HU12 8DZ
UK
Contact: Mr Dave Fanthorpe
Job Title:General Manager
T: + 44 1482 782 666/ + 44 7813 800251
F: + 44 1482 793 920
E: David@t ramcoeurope.karoo.co.uk
W: www.tramcoinc.com

Tramco, Inc
1020 East 19th Street
Wichita
KS
67214
USA
Contact: Mr Steve Cloud
Job Title:President
T: + 1 316 264 4604
F: + 1 316 264 7965
E: sales@tramcoinc.com
W: www.tramcoinc.com
TRAMCO has been involved in the design, application, engineering and manufacture of the worlds most complete line of chain conveyors, enclosed belt conveyors, specially designed conveyors and conveyor conversions since 1967. TRAMCO's philosophy is to produce high quality, reliable equipment that meets specific customer needs.

Translift Port Equipment Services Inc
Building 3
SRF Area
Subic Bay
Zambales
Freeport Zone 2222
Philippines
Contact: Mr John Wellington
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F: + 63 47 252 6336
E: translift@transliftsubic.com

Triodetic
10 Didak St
Arnprior
Ontario
K7S 0C3
Canada
Contact: Mr Tim Staniszewski
Job Title:Sales and Marketing Manager
T: + 1 613 623 3434 ext 2234
F: + 1 613 622 4003
E: info@triodetic.com
W: www.triodetic.com
Designs, manufactures and installs unique enclosed storage systems for all kinds of bulk materials, including the high capacity Space Frame domes and barrel vaults.

Triple Point Technology
22 Frith Street
Mayfield West
NSW
2304
Australia
Contact: Mr Steve Maxwell
Job Title:GVice President, Mining, APAC Sales
T: + 61 2 4908 2222
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E: info@tpt.com
W: www.tpt.com

Tsubakimoto Bulk Systems Corporation
4-1
Terauchi 2-Chome
Toyonaka
Osaka
561-0872
Japan
Contact: Mr Y Horii
Job Title:Manager, Overseas Operations
T: + 81 6 6862 2329
F: + 81 6 6862 8516
E: sales@tsubaki-bulk.com
W: http://tsubakimoto.com/tbs/
Produces bulk handling systems equipment, bucket, flow and pan conveyors.

TTS HuaHai Ships Equipment
18th Floor
3255 Zhou Jia Zui Road
Shanghai
200093
China
Contact: Mr Lian Zhou Yang
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T: + 86 21 6539 8257
F: + 86 21 6539 7400
E: info@tts-huahai.com

Ulrich Brehme GmbH
Otto-Hahn-Str. 1
Hattorf am Harz
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Germany
Contact: Mr Bodo Altgeld-Wichmann
Job Title:Marketing Manager
T: + 49 5584 94210 0
F: + 49 5584 94210 99
E: info@brehme-ubo.com
W: www.brehme-ubo.com

V D D B (Pty) Ltd
PO Box 16985
Lyttelton
Gauteng
0140
South Africa
Contact: Mr Leonard van der Dussen
T: + 27 12 664 2300
F: + 27 12 644 2902
E: admin@vddb.co.za
W: www.vddb.co.za
Services are delivered to a variety of projects for mining and industrial clients and range from performing a particular task such as providing a bill of quantities to taking charge of a comprehensive cost structuring, capital estimating and project cost management service through to final accounts and close-out.

Veenstra Machinefabriek B.V.
De Holwert 10
KC Coevorden
7741
The Netherlands
Contact: Mr Paul Kuiper
T: + 31 524 599 333
F: + 31 524 599 330
E: mach@veenstra-coevorden.nl
W: www.veenstra-coevorden.nl

Verachtert Nederland B.V.
De Bloemendaal 8
Hertogenbosch
North Brabant
5221EC
The Netherlands
Contact: Mr Robbert Boersma
Job Title:Sales Manager
T: + 31 73 640 41 11
F: + 31 73 641 97 40
E: info@veraned.nl
W: www.veraned.nl/en
In 60 years Verachtert has developed into the market leader of Work Tools for all types of diggers and wheel loaders, and offers solutions for the specific wishes of the customer. Verachtert products represent quality and productivity.

Verstegen Grijpers BV
PO Box 1014
Nieuwegein
3430 BA
The Netherlands
Contact: Mr Eric Visser
Job Title:Managing Director
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F: + 31 3060 60657
E: info@verstegen.net
W: www.verstegen.net
Manufactures and supplies wide range of grabs for all bulk commodities.

Vibrafloor
Les Pièces Bourgeoises
Givry
71640
France
Contact: Mr Jean-Claude Poncet
Job Title:President
T: + 33 3 85 44 06 78
F: + 33 3 85 44 06 79
E: jc.poncet@vibrafloor.com
W: www.vibrafloor.com
VIBRAFLOOR, the modular vibrating floor, is used in various bulk industries, inside silos, ships and railway cars as a versatile reclaimer using powered gravity.

Vigan
Rue de L'Industrie 16
Nivelles
B-1400
Belgium
Contact: Mr Nicolas Dechamps
Job Title:Managing Director
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F: + 32 67 89 50 60
E: info@vigan.com
W: www.vigan.com
VIGAN equipment are suited for most of materials in bulk such as cereals, oilseeds, alumina, chemicals and wood pellets. As a solution provider, VIGAN can manage your bulk handling projects from initial design up to full erection under "turnkey" condition

Webster Griffin Ltd
Brooklands Park
Farningham Road
Crowborough
East Sussex
TN6 2JD
UK
Contact: Mr Mark Wilson
Job Title:Managing Director
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F: + 44 1892 664340
E: info@webstergriffin.com
W: www.webstergriffin.com
Manufactures all types of bag and sack filling systems (including mobile systems), big bag/bulk bag filling systems, robot palletising systems for all types of grain, granular or powdered products.

Wieland Luftechnik GmbH
Wetterkreuz 12
Erlangen
91058
Germany
Contact: Mr Gerhard Borrmann
Job Title:Export Manager
T: + 49 9131 60 67 0
F: + 49 9131 60 67 97
E: info@wieland-luft.de
W: www.wieland-luft.de
Wieland Lufttechnik GmbH & Co.KG has manufactured industrial vacuum cleaning equipment for more than 50 years. Specialized in portable, stationary and truck- or trailer-mounted vacuum cleaning systems. See www.wieland-luft.com.

Windmöller & Hölscher KG
Münsterstr. 50
Lengerich
D-49525
Germany
Contact: Mrs Elisabeth Braumann
Job Title:Public Relations
T: + 49 5481 14 2929
F: + 49 5481 14 3355
E: elisabeth.braumann@wuh-group.de
W: www.wuh-group.com/
Windmöller & Hölscher - one of the leading machine manufacturers in the world for the flexible packaging industry and the global leader in bag making and bagging equipment.

Worley Parsons Canada (Westmar)
400-233 West First Street
North Vancouver
BC
V7M 1B3
Canada
Contact: Mr Richard Malinek
T: + 1 604 985 6488 ext 5218
F: + 1 604 985 2581
E: info@westmar.com
W: www.westmar.com
Provides consulting engineering services to clients worldwide. The diverse experience gained over thousands of projects, combined with a commitment to research results in maximum value for clients. The team of project management and design specialists work with clients to develop projects from concept to completion, providing services ranging from initial planning and economic evaluation studies through to detailed design, procurement, construction and commissioning.

	Ship & Barge Loaders	Pneumatic Ship & Barge Unloaders	Mechanical Ship & Barge Unloaders	Conveyors	FIBCs, Bags & Bag Handling	Hoppers	Grabs	Dust Suppression	Sampling & Inspection	Weighing & Measuring	Grading & Sifting	Truck Loaders & Unloaders	Railcar Loaders & Unloaders	Storage Systems	Engineering Consultants	Other
4B BRAIME Elevator Components			✔	✔											✔	✔
A/S Cimbria	✔			✔		✔		✔			✔	✔		✔	✔	
AgGrowth International Inc.				✔		✔	✔	✔								
Agrico Sales, Inc.	✔			✔										✔		
Agromatic AG									✔	✔					✔	
Alcan Alesa Technologies Ltd	✔	✔		✔		✔						✔	✔	✔		
Alex Stewart Agriculture Ltd									✔	✔						
Alex Stewart International									✔							
Alfredo Brand P.																
Antar@Pressvess				✔		✔				✔				✔		
Anvil Attachments	✔					✔	✔									
Arlona Engineering			✔	✔	✔	✔	✔								✔	
Atlas Manufacturing Co. Inc							✔									
Aurecon	✔															
Aurecon Hatch	✔			✔			✔						✔		✔	
Ausenco	✔		✔	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Bayards Aluminium Constructions														✔		✔
BEHN + BATES Maschinenfabrik GmbH & Co. KG					✔											
Bergu International AB				✔										✔		
BGS Holland	✔				✔			✔				✔	✔	✔		
Birrus International Pty Ltd				✔												
BLUG Credeblug S.L.							✔									
Bosch Rexroth B.V.	✔	✔	✔	✔		✔										
Boyne Area Manufacturing (BAM)	✔	✔	✔	✔	✔	✔	✔	✔				✔	✔	✔	✔	✔
Brock Grain Systems														✔		
BRUKS Rockwood Incorporation																
BSI Inspectorate									✔	✔						
Bucket Mart Inc.	✔	✔	✔	✔		✔	✔			✔		✔	✔		✔	✔
Bühler AG, Grain Logistics	✔	✔	✔	✔		✔		✔	✔	✔	✔	✔	✔	✔	✔	
Bulk Lift International	✔				✔									✔		
Buttimer Bulk Engineering	✔		✔	✔		✔		✔	✔	✔		✔	✔	✔	✔	
BV Beco							✔									
C Spencer Ltd																
Cachapuz Bilanciai Group										✔		✔			✔	✔
Calim Grab Industry	✔					✔	✔									
Camar Mill Systems Ltd															✔	
Cambelt International Corp				✔										✔		
Cargotec Sweden Bulk Handling AB (Siwertell brand)		✔	✔	✔	✔										✔	✔
Caterpillar Belgium																
Caterpillar Inc												✔				
Cavotec Deutschland GmbH	✔			✔											✔	
Cavotec SA																✔

	Ship & Barge Loaders	Pneumatic Ship & Barge Unloaders	Mechanical Ship & Barge Unloaders	Conveyors	FIBCs, Bags & Bag Handling	Hoppers	Grabs	Dust Suppression	Sampling & Inspection	Weighing & Measuring	Grading & Sifting	Truck Loaders & Unloaders	Railcar Loaders & Unloaders	Storage Systems	Engineering Consultants	Other
CDM Systems, Inc				✔												
Cesur Packaging Corporation					✔											
CFS Handling srl.							✔									
Chief Industries UK Ltd.				✔										✔		
Chief Industries, Inc.																
China Huadian Engineering Co., Ltd.(CHEC)	✔		✔	✔										✔		
China Sonangol International (S) Pte Ltd															✔	
Christianson Systems Inc.		✔		✔								✔	✔			
Cimbria Bulk Equipment	✔			✔				✔				✔	✔			
Clariant Corporation																✔
Claudius Peters Technologies S.A.S				✔										✔		
Cleveland Cascades Ltd	✔							✔				✔	✔	✔		
COBRA Europe SA				✔												
Cofely Experts BV	✔	✔														
Condepols S.A.					✔											
Conductix-Wampfler AG	✔	✔	✔	✔								✔				✔
Conductix-Wampfler Americas	✔	✔	✔	✔								✔				✔
Conservatek Industries, Inc.														✔		
Continental Construction (Memphis)	✔	✔	✔	✔		✔		✔				✔	✔	✔		
Continental Conveyor & Equipment Co Inc				✔												
ContiTech Transportbandsysteme GmbH				✔												
Coperion GmbH																
CPS Projects (Pty) Ltd	✔						✔					✔				
CST Covers														✔		
CST Storage						✔								✔		
Dbis (Software and Automation) Ltd										✔				✔	✔	
DCL, Incorporated	✔			✔	✔			✔				✔	✔	✔		
De Regt Conveyor Systems				✔												
Dearborn MidWest Conveyor Co.	✔			✔		✔		✔				✔	✔	✔	✔	✔
Demag Cranes & Components GmbH			✔													✔
DeMarco Industrial Vacuum Corporation	✔	✔			✔							✔	✔			
Dinnissen BV				✔	✔	✔					✔					
DMN-WESTINGHOUSE					✔					✔						
Dome Corp of North America								✔						✔		
Dome Technology														✔	✔	
DOMTEC International LLC														✔		
Donaldson Filtration Deutschland GmbH								✔								
Doosan Benelux SA			✔										✔			
Dos Santos International, LLC	✔		✔	✔											✔	
DSH Systems Ltd.	✔							✔				✔	✔			
Dust Control Technology				✔		✔		✔								

	Ship & Barge Loaders	Pneumatic Ship & Barge Unloaders	Mechanical Ship & Barge Unloaders	Conveyors	FIBCs, Bags & Bag Handling	Hoppers	Grabs	Dust Suppression	Sampling & Inspection	Weighing & Measuring	Grading & Sifting	Truck Loaders & Unloaders	Railcar Loaders & Unloaders	Storage Systems	Engineering Consultants	Other
Dust Solutions Inc.								✔								
E-Crane World Wide	✔		✔				✔									
E-Crane World Wide / E-Crane International USA	✔		✔			✔	✔								✔	
ECS Eurocargo Services AS									✔	✔						
Edge Innovate																
Elgin Engineering and Construction															✔	
EMS-TECH Inc	✔		✔	✔		✔		✔						✔	✔	✔
Enclosed Bulk Systems BV				✔												
Enco Engineering Inc	✔			✔		✔								✔	✔	
Endress + Hauser Inc										✔						
Engicon nv	✔			✔		✔						✔	✔	✔		
EQUIPO LLC							✔									
ESI Eurosilo BV														✔	✔	
Euromec Srl							✔									
Euro-tech Corporation							✔									
Euro-Tramco BV			✔	✔												
FAM Foerderanlagen Magdeburg	✔		✔	✔		✔						✔	✔	✔		
Figee Crane Services BV	✔		✔			✔		✔							✔	
Flexco				✔												
Flexco Europe GmbH				✔												
Flexoveyor Conveyor				✔								✔	✔			
FLSmidth Wadgassen GmbH	✔	✔	✔	✔		✔			✔	✔		✔	✔	✔	✔	
Ganz Danubius Trading Co Ltd	✔		✔				✔									
Garwood Consulting Ltd	✔		✔	✔		✔		✔				✔	✔	✔	✔	
General Kinematics Corp.				✔						✔						
Geométrica de México, S.A. de C.V.														✔		
Geometrica Inc								✔						✔		
Geroldinger GmbH & Co KG				✔	✔	✔						✔	✔	✔		
Golfetto Sangati S.r.l.	✔	✔	✔	✔						✔	✔			✔		
Goodman Conveyor Company				✔												
Goodtech Solutions AS				✔	✔	✔	✔	✔		✔		✔	✔	✔	✔	
Greystones Cargo Systems (Pty) Ltd	✔	✔		✔												
Gulsan A.p.					✔											
Guttridge Ltd			✔	✔	✔									✔		
Guven Grab and Machine Ltd. Co							✔									
Hanson Silo Company														✔		
Haskoning India Pvt Ltd																
Hasler International SA										✔						
Henry International Diplomatic Marine																✔
Heyl & Patterson Inc			✔				✔					✔	✔		✔	
Horizon Conveyor Equipment				✔												
Hycontrol Limited									✔	✔						
IBC International Handling AB				✔	✔	✔				✔					✔	

	Ship & Barge Loaders	Pneumatic Ship & Barge Unloaders	Mechanical Ship & Barge Unloaders	Conveyors	FIBCs, Bags & Bag Handling	Hoppers	Grabs	Dust Suppression	Sampling & Inspection	Weighing & Measuring	Grading & Sifting	Truck Loaders & Unloaders	Railcar Loaders & Unloaders	Storage Systems	Engineering Consultants	Other
IMASA																
IMGS																
Inspectorate America Corporation									✔							
Interjute BV					✔											
Intersystems				✔					✔	✔				✔		✔
Italgru S.r.l																
J & B Grabs b.v.							✔									
Jansen & Heuning																
Jem International & Express Scale Parts				✔	✔	✔				✔						
Jenike & Johanson Inc.						✔		✔						✔	✔	
Jim Way Enterprise Co Ltd				✔												
Joy Mining Machinery				✔												
Kardesler Grab & Machine						✔	✔									
Kinergy Corporation				✔		✔					✔		✔			
King Bag & Manufacturing Co					✔									✔		
KIROW ARDELT GmbH	✔		✔													
KRANUNION GmbH																
Lachenmeier Monsun A/S				✔				✔				✔		✔		
Laidig Systems Inc						✔						✔		✔		
Langston Companies Inc.					✔											
Larox Flowsys Oy																✔
Lawrence Industries, Inc.						✔								✔	✔	✔
Libran Engineering and Services	✔	✔	✔	✔	✔			✔				✔	✔	✔	✔	
Librawerk Maschinenfabrik GmbH					✔					✔						
Liebherr Maritime Cranes	✔		✔													
Listenow GmbH & Co.	✔				✔							✔	✔			
LogSys NV										✔						✔
Macawber Engineering, Inc				✔												
Mack Manufacturing Inc							✔									
Mantsinen Group Ltd Oy	✔		✔				✔					✔	✔			✔
Maquinas Condor SA	✔	✔	✔	✔			✔	✔								
Martin Engineering				✔				✔					✔			
Martin Engineering GmbH	✔			✔				✔	✔						✔	
Martin Engineering South Africa				✔												
Maschinen und Mühlenbau Erhard Muhr GmbH	✔											✔	✔			
Merrick Industries										✔						
Metso Minerals Industries, Inc.	✔		✔	✔			✔						✔	✔	✔	
Midwest International Standard Products, Inc.	✔			✔				✔				✔	✔			
Mole•Master Services Corporation™						✔								✔		
MRS Greifer GmbH							✔									
Mühlen Sohn GmbH & Co. KG		✔										✔	✔	✔		
Muller Beltex BV				✔											✔	✔
NAVCO (National Air Vibrator Co)																✔

	Ship & Barge Loaders	Pneumatic Ship & Barge Unloaders	Mechanical Ship & Barge Unloaders	Conveyors	FIBCs, Bags & Bag Handling	Hoppers	Grabs	Dust Suppression	Sampling & Inspection	Weighing & Measuring	Grading & Sifting	Truck Loaders & Unloaders	Railcar Loaders & Unloaders	Storage Systems	Engineering Consultants	Other
Nectar Group Ltd		✔	✔	✔	✔	✔	✔			✔		✔	✔	✔	✔	
Negrini Srl							✔									
Nemag BV			✔				✔	✔								
NERAK GmbH Fördertechnik				✔												
Neuero Industrietechnik GmbH	✔	✔	✔	✔								✔	✔			
Nilfisk-CFM SpA		✔		✔		✔										
NKM Noell Special Cranes GmbH	✔		✔												✔	✔
Nordströms Konstruktionsbyrä	✔			✔		✔			✔			✔	✔	✔		
Nordstrong Equipment Ltd				✔												
Orthos Projects Ltd.			✔	✔		✔		✔		✔				✔		
ORTS GmbH Maschinenfabrik							✔									
PAGE MACRAE ENGINEERING						✔	✔	✔				✔				
PAM Poul Andersen Maskinfabrik A/S		✔		✔												
Paul Hedfeld GmbH				✔												
Pavan Group Srl																
PEBCO®	✔							✔		✔		✔	✔			
PEINER SMAG Lifting Technologies GmbH							✔									
Peterson Agricare & Bulk Logistics BV									✔							
Pfister Waagen Bilanciai GmbH										✔						
PHB Weserhütte, S.A.	✔		✔	✔		✔						✔	✔	✔	✔	
Phenix Rousies Industries				✔				✔						✔		
Pirs SAS														✔		
Plantragg Developments			✔													
PLM Cranes B.V.							✔									
Polymer Industries - Ultrapoly Division																✔
Portpack UK Limited					✔											
Port-Trade ApS	✔						✔							✔		
Powertex Inc					✔											✔
Precia-Molen Nederland BV					✔	✔				✔						
Premier Tech Chronos b.v.				✔	✔	✔				✔						
Premier Tech Chronos GmbH				✔	✔	✔				✔						
Premier Tech Chronos Ltd				✔	✔	✔				✔						
Premier Tech Chronos s.r.l.				✔	✔	✔				✔						
Primasonics International Limited				✔		✔		✔				✔	✔	✔		
Procon Engineering Limited										✔						
PT. Bando Indonesia				✔												
Quadrant Engineering Plastics Products						✔						✔	✔			
R & S S.r.L.	✔	✔		✔	✔	✔		✔		✔		✔	✔	✔	✔	✔
Rapat Asia																
Rapat Corporation																
Rapidpack Corporation																

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The conference focuses on dry bulk trade, shipping, logistics, ports, terminals and engineering.

Topics

• Outlook for the dry bulk trade and the implications for bulk carrier demand • Chinese steel market and prospects for seaborne iron ore trade • The European coal industry, coal production and prospects for imports • The Demand and Supply of the Dry Cargo Fleet • BIMCO's point of view on the dry bulk market. • General challenges from a shipowner's perspective • Big Data and Shipping • Industrial minerals logistics - a case study • The advantages of using offshore transhipment considering the current trends within the coal market • Latest developments at IMO • Bulk analytical logistical flows • Case study in relation to our recent coal terminal operation in Africa • Dry bulk terminal design: dynamic simulation software or rule of thumbs? • Simulation-integrated design of dry bulk terminals • Logistical issues with inventory tracking associated with solids flow • Dust suppression - modern techniques • Update on biomass handling at ports and power stations • Automatic Train Loading of Biomass - A case study • Design process of port equipment and innovations to make equipment more reliable, sturdy and efficient

Speakers

• Susan Oatway, Senior Consultant, Drewry Shipping Consultants Ltd • Jeffrey Landsberg, President, Commodore Research & Consultancy • RA Dr. Erich Schmitz - Managing Director - Verein der Kohlenimporteure e.V. • Jonathan Challacombe, Associate Professor in Maritime Studies & International Logistics Plymouth Business School • Peter Sand, Chief Shipping Analyst, BIMCO • Christian Ingerslev, Vice President, Head of Business Development Desk, NORDEN A/S • David Peel, European Manager, RightShip • Ulrich Koester, Managing Owner, Maritime Tecnet GmbH • Capt. Giordano Scotto d'Aniello, Commercial Director, Coeclerici S.P.A • Ian Adams, Executive Director, International Dry Bulk Terminals Group • David Trueman, DBIS • Han Ozturk, Managing Director, Nectar • Johan Pruisken, Director Advisory Group Heavy Industry & Logistics, Royal HaskoningDHV • Teus van Vianen, Delft University of Technology • Brian Pittenger, Director Business Development, Jenike & Johanson, Inc. • Micha de Jong, General Manager, Wuvio Chemicals • Professor Mike Bradley, Greenwich University • Ian Atkinson, Engineering Director, C Spencer Ltd • Fergal Buttimer, Director, Buttimer Group

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RBL-REI France				✔		✔						✔		✔		
RDS Technology										✔						
Redler® (Schenck Process Group)		✔	✔	✔				✔		✔		✔	✔	✔		
REMA TIP TOP GmbH				✔					✔					✔	✔	✔
RHC Deutschland GmbH	✔	✔	✔	✔		✔		✔	✔				✔	✔	✔	
River Consulting															✔	
Robson Handling Technology				✔		✔				✔		✔		✔	✔	
Ronin GMS									✔	✔	✔			✔		✔
Royal Haskoning DHV															✔	
RTA ALESA Ltd.	✔	✔		✔								✔	✔	✔		
Rubb Buildings Ltd														✔		
RULMECA HOLDING S.P.A.				✔												
SAMSON Materials Handling Ltd	✔		✔	✔		✔		✔				✔	✔	✔		
Sartorius Mechatronics T&H GmbH										✔						
Schenck Process UK Ltd T/A Redler				✔		✔				✔				✔		
Schouten Commodities BV																✔
Scorpio Engineering Pvt. Ltd	✔	✔		✔	✔	✔		✔		✔		✔	✔	✔	✔	
Seabulk Inc	✔			✔											✔	
S-E-G Instrument AB										✔						
Sempertrans France Belting Technology SAS				✔												
SENNEBOGEN Maschinenfabrik GmbH	✔				✔							✔	✔			
Servo Berkel Prior										✔						
SESCOTRANS (SAE)																
SEW-EURODRIVE GmbH & Co KG																✔
SGH Equipment Limited				✔	✔	✔		✔		✔	✔	✔		✔	✔	
SGS									✔							
SGS (Nederland) BV									✔							
SGS Australia Pty Ltd									✔							
SGS Austria Controll-Co GmbH									✔							
SGS Minerals Services									✔							
Shanghai Global Machinery. Co., Ltd (SGMC)							✔									
Shanghai Janus Grab Co., Ltd.						✔	✔									
Shanghai Qifan Co., Ltd.	✔						✔									
Shanghai Zhenhua Port Machinery Co (ZPMC) Ltd	✔		✔												✔	
Shanthi International		✔	✔	✔		✔	✔							✔		
SIBRE - Siegerland Bremsen GmbH																
SMB International GmbH	✔		✔	✔	✔										✔	
Sobemai by IRI nv	✔					✔	✔					✔	✔	✔		
Solimar Pneumatics														✔		
Sotecma Inc Process Engineers				✔								✔	✔	✔	✔	
STAG AG				✔												

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Stewart Inspection and Analysis (Pty) Ltd									✔							
Strudes Inc	✔	✔	✔	✔	✔	✔		✔	✔	✔		✔	✔	✔	✔	
Sub Con Ltd																
Suomen Viljava Oy														✔		
Supercargo, Lda									✔	✔				✔		
Superior Industries, Inc.	✔			✔		✔						✔	✔	✔	✔	✔
Svendborg Brakes A/S	✔		✔	✔									✔		✔	
Swire CTM Bulk Logistics																✔
TAIM WESER, S.A.	✔	✔	✔	✔										✔		
TBMA Europe BV	✔				✔				✔	✔		✔	✔		✔	
TBS Shipping Services																
Tebodin Consultants & Engineers															✔	
techNaero aps								✔								
Telestack Limited	✔		✔	✔		✔		✔		✔		✔	✔			
Terex Port Solutions	✔	✔	✔													
Teta Mühendislik A. .		✔	✔	✔	✔					✔				✔		
The Grab Specialist b.v.							✔									
Thermo Fisher Scientific									✔	✔						
ThyssenKrupp Canada	✔	✔	✔	✔												
ThyssenKrupp Industrial Solutions AG	✔		✔	✔		✔		✔	✔	✔		✔	✔	✔		
ThyssenKrupp Robins, Inc.	✔	✔	✔	✔												
Tideworks Technology - Europe																✔
Timars Svets & Smide AB					✔											
TMSA Tecnologia em Movimentação S/A	✔	✔	✔	✔		✔	✔	✔	✔			✔	✔	✔		✔
Tramco Europe Limited	✔		✔	✔												
Tramco, Inc				✔												
Translift Port Equipment Services Inc		✔		✔		✔										
Triodetic								✔						✔		
Triple Point Technology																✔
Tsubakimoto Bulk Systems Corporation				✔												
TTS HuaHai Ships Equipment																✔
Ulrich Brehme GmbH	✔			✔				✔	✔	✔		✔	✔		✔	
V D D B (Pty) Ltd																✔
Veenstra Machinefabriek B.V.	✔							✔								
Verachtert Nederland B.V.							✔									
Verstegen Grijpers BV							✔									
Vibrafloor																
Vigan	✔	✔	✔	✔								✔	✔	✔	✔	
Webster Griffin Ltd					✔											
Wieland Luftechnik GmbH																✔
Windmöller & Hölscher KG					✔											
Worley Parsons Canada (Westmar)	✔	✔	✔	✔		✔		✔				✔	✔	✔	✔	


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ALUMINA UNLOADER

Ausführung

Leistung:	400 t/h
Fördergüter:	Alumina
Abmessungen:	28 m Ausleger
Bauweise:	auf Schienen
Schiffsgrößen:	Handymax
Bemerkungen:	12 Tonnen Hilfswinde

Design

Capacity:	400 t/h
Products:	Alumina
Dimensions:	28 m Boom
Type:	on Rails
Ship size:	Handymax
Remarks:	12 ton Auxiliary Winch

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