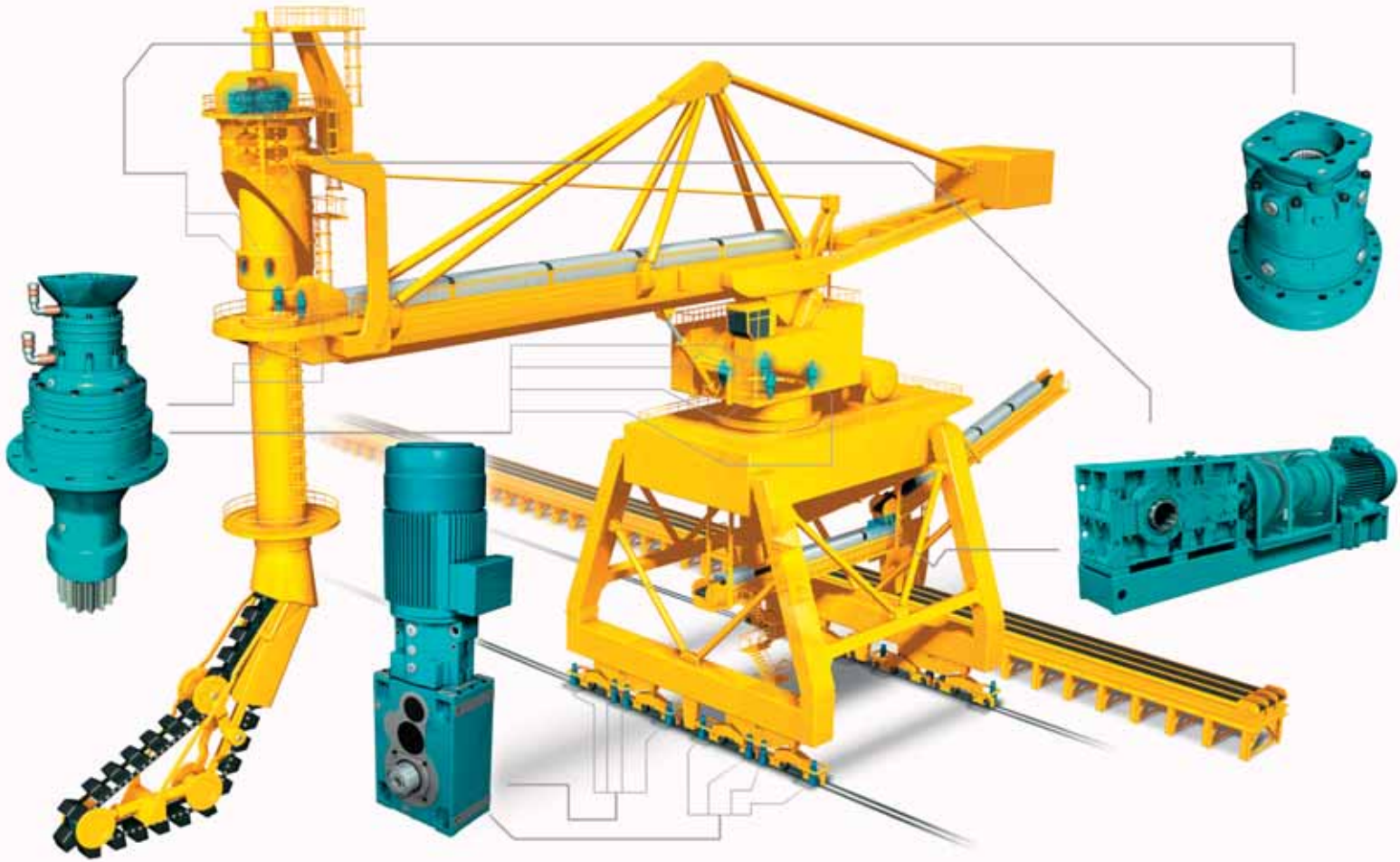




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FEATURES

- Bauxite & Alumina
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PIV Drives GmbH
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61352 Bad Homburg/Germany
T: +49 06172-102 0
F: +49 06172-102 381
E: sales@piv-drives.com
www.piv-drives.com www.brevini.de



PUBLISHERS

Jason Chinnock
jason@dc-int.com
Andrew Hucker-Brown
andrew@dc-int.com

EDITORIAL

Louise Dodds-Ely Editor
louise@dc-int.com
Jay Venter Deputy Editor
editorial@dc-int.com
Samantha Smith Directories
directories@dc-int.com
Stephanie Hodgkins Office Manager
accounts@dc-int.com

SALES

Lourens van Emmenis Sales Director
sales@dc-int.com
Matthew Currin Senior Sales Executive
sales2@dc-int.com

CORRESPONDENTS

Brazil **Patrick Knight**
Canada **Ray Dykes**
India **Kunal Bose**
Asia **David Hayes**
Europe **Barry Cross**
Malaysia **Wira Sulaiman**
Philippines **Fred Pundol**
South Africa **Iain McIntosh**
Thailand **David Turner**
UK **Maria Cappuccio**
UK **Michael King**
UK **Richard Scott**
USA **Colby Haines**
USA **Walter Mitchell**

ADMINISTRATIVE OFFICE

Business Publishing International
Corporate House, 11 Sinembe Crescent
La Lucia Ridge, South Africa, 4051
Tel: +27 31 583 4360
Fax: +27 31 566 4502
Email: info@dc-int.com

HEAD OFFICE

Trade Publishing International Limited
Clover House, 24 Drury Road,
Colchester, Essex CO2 7UX, UK
Tel: +44 (0)1206 562560
Fax: +44 (0)1206 562566
Email: info@dc-int.com
Website: www.dc-int.com
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GRAIN HANDLING DIRECTORY

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Grain trade pickup ahead

Growth-inducing features are identifiable in many dry bulk commodity trades, but grain has been a prominent exception during the past twelve months. This pattern is set to change. Expansion in seaborne volumes of minerals and other industrial bulk cargoes moving is expected to continue, but could be accompanied by an upturn in the grain sector over the period ahead.

Global economic developments are providing only limited support, however. It now seems likely that China's GDP growth rate in 2013 will not exceed last year's 7.8%, instead of the slight improvement predicted earlier. And the OECD's latest assessment of economic growth in the advanced countries group (mainly Europe, USA, Japan and Korea) points to a sluggish 1.2% average this year, marginally below last year's minimal advance.

GRAIN

Following a downturn in global wheat and coarse grains trade during crop year 2012/13 ending last month, a modest turnaround is foreseen. International Grains Council estimates, summarized below, show the volume edging upwards by 1% in the new 2013/14 year starting July, reaching 263mt (million tonnes).

Increased grain imports into a number of Asian countries, including China, is one positive influence envisaged. North African countries also may need more supplies. Conversely, movements into the Middle East and Europe may decline. However, prospects will remain highly tentative until summer 2013 domestic harvests in northern hemisphere importing areas are more certain. Unexpected weather changes at the end of the crop growing season could alter forecasts.

IRON ORE

Signs pointing to higher imports into China are the most positive aspect of the outlook for iron ore trade. A few other relatively minor additional volumes seem quite likely, but the European element is developing negatively amid weakness in steel production caused by the ongoing economic recession.

The latest forecast by Australia's BREE (Bureau of Resources and Energy Economics) published at the end of

last month provides an optimistic view. Global iron ore trade — including land movements, but mostly seaborne — is expected to grow by just over 5% in 2013, to 1,186mt, followed by faster expansion next year. Within this overall progress, China's imports are estimated to increase by 4% annually, reaching 805mt in 2014.

COAL

Among importing countries expected to contribute to continuing solid growth of world coal trade, the Asian area is the most prominent. But Europe's rising volumes, a somewhat unexpected trend, have been significant recently as well. However, prospects for individual countries within the European region this year are mixed.

Seaborne coal imports into the EU apparently rose to around 190mt in 2012, with sharply higher steam coal volumes a key feature. While coking coal imports have been adversely affected by steel production weakness, other users of imported coal purchased additional quantities. Steam coal's competitiveness for power generation is particularly noticeable, although Spain's large increase last year may be reversed in 2013.

MINOR BULKS

One element of the minor bulk trades group, traditionally described as a 'major bulk trade' but no longer justifying that label, is phosphate rock. In 2012 estimated global seaborne movements were about 30mt, slightly above the previous year's figure. Indian phosrock imports, comprising about one-third of the total, grew sharply last year and look set to increase further.

BULK CARRIER FLEET

Deadweight capacity growth in the Handysize (10–39,999dwt) bulk carrier sector has become minimal, as shown by table 2. This remarkable change contrasts starkly with other bulk carrier size groups where expansion, although slowing, is still rapid. Much lower Handysize newbuilding deliveries during 2013, coupled with substantial scrapping, could reduce the fleet's growth rate to under the 1% seen last year, which raised capacity to 85m dwt at year-end.

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

	2008/09	2009/10	2010/11	2011/12	2012/13*	2013/14*
Asia (excluding Japan)	45.2	50.1	55.5	57.9	56.1	61.0
Japan	23.8	25.4	24.7	23.0	23.8	24.0
Middle East	50.1	42.5	34.9	45.7	45.9	44.5
Africa	55.0	52.6	53.1	58.6	52.8	56.3
Others	75.4	69.8	74.5	84.4	82.3	76.9
world total	249.5	240.4	242.7	269.6	260.9	262.7

source: International Grains Council, 31 May 2013 *forecast July/June crop years

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

	2008	2009	2010	2011	2012	2013*
Newbuilding deliveries	3.0	5.0	8.4	9.3	9.8	6.5
Scrapping (sales)	1.7	5.6	2.7	5.3	8.1	6.0
Losses	0.0	0.2	0.0	0.2	0.1	0.0
Plus/minus adjustments	-0.1	0.5	0.0	-1.0	-0.8	0.0
World fleet at end of year	76.2	75.9	81.6	84.4	85.2	85.7
% change from previous year-end	+1.6	-0.6	+7.5	+3.5	+1.0	+0.6

source: Clarksons (historical data) & Bulk Shipping Analysis 2013 forecast *forecast

by Richard Scott, Bulk Shipping Analysis, Tel: +44 (0)12 7722 5784; Fax: +44 (0)12 7722 5784; e-mail: bulkshipan@aol.com



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Steelmaking raw materials trade contrasts

Rapidly rising steel production in China, accompanied by sharply declining output in Europe, provided striking contrasts among key importers of the industry's raw materials recently. Elsewhere, South Korea's steel production also fell, but volumes in Taiwan and India were higher and Japan saw a marginal increase.

Continued expansion in China is particularly beneficial for raw materials exporting countries, including Australia, Brazil and many other suppliers, as well as benefiting port operators and shipowners employing bulk carriers in these trades. Other importers, especially Japan and the European Union, remain key elements, but iron ore movements into China are the dominant factor, together with sizeable coking coal imports.

STEEL INDUSTRY TRENDS

Differing performances are underlined by figures for steel output during the first five months of 2013, compiled by the World Steel Association. In Europe, continued weakening is a prominent feature. Within the entire European Union crude steel production, at 69.9mt (million tonnes), was 4.2mt or 6% lower than seen in last year's same period.

South Korea also saw a large reduction of 5%, to 27.6mt in this year's January–May period. By contrast Taiwan, a smaller producer, experienced a robust 7% increase to 9.4mt. In China, where the industry operates on a vastly greater scale than in any of the other producing countries, steel production rose by 24mt or 8%, to reach 325.2mt.

This pattern may not be representative of percentage changes in the entire current year. The table below shows steel output estimates for 2013 as a whole, based on results for the first five months coupled with expectations for the remaining period. The group of countries shown accounts for about 95% of global seaborne iron ore trade and about 75% of seaborne coking coal trade.

Because of its role as a major coking coal (but not iron ore) importer, another significant country is India. Steel production at Indian mills developed positively in the first five months of 2013, growing by 3% to 33.3mt.

CHINA'S IMPORTS

Amid rising steel production in China over recent months, iron ore imports continued expanding solidly. In the January–May 2013 period, Chinese importers received iron ore volumes totalling 322.1mt, a 13.4mt or 4% rise compared with last year's same period.

Background events were not entirely favourable, however. Expectations of a gradual strengthening of the Chinese economy during the first half of this year have not been fulfilled. Despite government attempts to stimulate economic activity, growth appears to be slowing rather than accelerating, and there is much greater uncertainty about the outlook. A solid pick up in the second half is

looking unlikely, implying some adverse effects on steel demand and output.

Domestic iron ore mines in China, supplying a large proportion of the country's requirements, are another key influence. Production of this mainly inferior-quality material still appears to be on an upwards trend. But foreign supplies from Australia, Brazil, and various other sources clearly have remained highly competitive. Steel mills often prefer the higher specification ore available from these suppliers.

Over the period ahead slackening steel production may emerge, implying negative effects on iron ore usage. Conversely, support for iron ore import demand could be derived from low stocks and attractive delivered prices for foreign supplies, compared with domestic ore. Consequently a substantially increased import volume in 2013 as a whole, from last year's 744mt, could be seen. Higher coking coal imports (54mt in 2012) also are foreseeable.

OTHER KEY IMPORTERS

In the EU there seems to be growing confidence that the worst of the sovereign debt and banking crisis has passed, but recession persists. Amid continuing austerity measures economic recovery probably will be extremely slow, which does not suggest an encouraging outlook for the steel industry. Weakness in steel consuming industries now points to a sizeable reduction in steel output this year, as shown in the table.

A recent report published by Eurofer (European Steel Association), forecast a 2% reduction in EU steel demand during 2013, even after incorporating a turnaround to growth in the final quarter. This organization views the EU market situation over the balance of 2013 as likely to remain depressed.

Circumstances in Japan are brighter. Signs have emerged suggesting a revival of the Japanese economy following radical changes to fiscal and monetary policy introduced by the new government. While some scepticism has been expressed about how effective these will prove, beneficial results already have been seen.

Iron ore imports into Japan rose by 2% in the first five months of 2013, compared with the same period of last year, reaching 56.1mt. This strengthening reflects a modestly higher steel production trend which looks maintainable, benefiting from firmer domestic demand and also from buoyant exports of steel products. A recent survey published by the Japanese government highlighted improved domestic demand from the construction sector and related restocking.

An intriguing possibility has arisen that India could become a net importer of iron ore, as well as being a substantial coking coal importer. Indian iron ore exports have been declining rapidly in the past few years amid mine closures and high export tax. Reduced output has already caused Indian steel producers to turn towards foreign ore suppliers for limited quantities.

Richard Scott

CRUDE STEEL PRODUCTION (MILLION TONNES)

	Key raw materials importing countries					
	2009	2010	2011	2012	2013*	% change**
China	577.1	638.7	694.8	716.5	760.0	+6.0
Japan	87.5	109.6	107.6	107.2	109.0	+1.6
EU-27 group	139.3	172.8	177.7	168.6	162.0	-4.0
South Korea	48.6	58.9	68.5	69.1	68.0	-1.6
Taiwan	15.8	19.8	20.2	20.7	20.0	-3.4
Total	868.3	999.8	1,068.8	1,082.1	1,119.0	+3.4

source: World Steel Association, and Bulk Shipping Analysis 2013 forecasts * forecast ** % change 2013, compared with 2012

Bauxite & alumina trades



Emerging and developing nations rich in mineral resources nurse the ambition of adding sufficient value to natural resources before these leave their shores, writes *Kunal Bose*. Driven by this logical desire but which comes as a shocker to big natural resources importing nations like China, Japan and South Korea. Since 2009, Indonesia has had a law in place, which obliges mining groups to process minerals up to a point — like bauxite being refined into intermediate chemical alumina, feedstock for aluminium smelters. But it was only last year that Djakarta started pursuing the goal of value addition with seriousness by way of a 20% export tax on bauxite and also export restrictions on the mineral. China, which is always found to be managing its exim trade with great dexterity, imported unusually large 5.3mt (million tonnes) of bauxite from Indonesia during March and April of 2012 in a move to stockpile ahead of any export curbs. Denied the supply of good quality bauxite from its own mines, Chinese imports of the mineral were over 40mt in 2012 in which the share of Indonesia was as much as 28.4mt. The second biggest supplier to China was Australia with 9.5mt followed by India with over 1.3mt.

Whatever the quality of its bauxite and cost of its mining and refining, China remains relentless in stepping up production of the mineral by opening new mines and also expanding the ones in operation. This becomes evident from China's consumption of bauxite rising 28% to nearly 115mt in 2012 when imports fell by 5.4mt. According to the Chinese ministry of land and resources,

the country's proven bauxite reserves grew 210mt to 4.08bn tonnes in 2012, rising for three consecutive years at a CAGR of 4.75%.

"There is a lesson for India and for many other mineral resource rich countries in the way China goes about prospecting and exploration employing state-of-the art devices, including satellite reconnaissance. The low quality of its bauxite and also the high cost of its extraction are not proving deterrents for China's progress in bauxite mining. Bauxite in China is found almost entirely in Shanxi, Henan, Guizhou, Guangxi, Sichuan, Shandong and Yunan provinces," says RK Sharma, director general of Federation of Indian Mineral Industries. Resource nationalism manifested in growing degrees from Indonesia to Vietnam to India will explain China's relentless pursuit of self-reliance in bauxite and iron ore. An Alcoa official recently said in an interview with London-based *Metal Bulletin* that "what happened last year in Indonesia was really a wake-up call in China. It's not maybe so much that the industry expected a ban would be effected, but I think probably the industry was surprised that Indonesia actually did stop bauxite shipments for a few months."

Whatever the domestic production of bauxite, China is destined to remain a big importer of the mineral. The challenge for the country is to harness a very big percentage of alumina refinery capacity of 54mt, for which domestic bauxite supply will not be enough at least in the foreseeable future. In the first four



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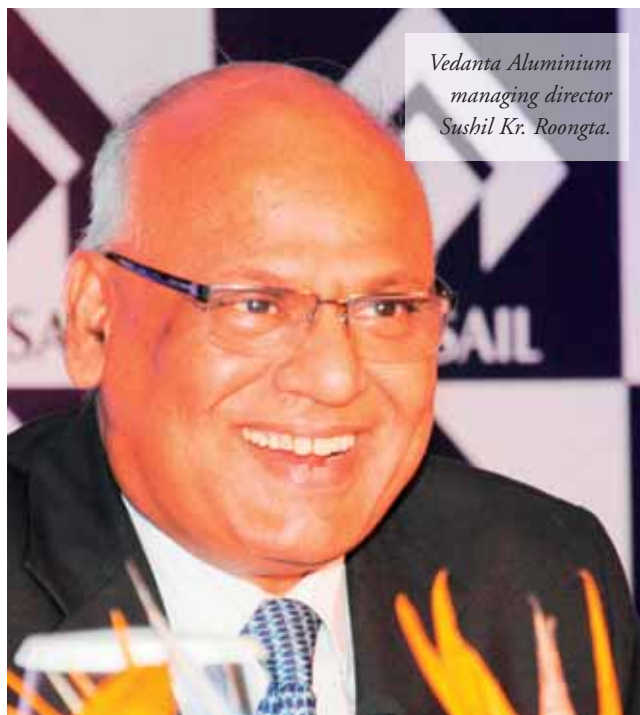
months of 2013, China's bauxite imports were up 14.62% to 20.65mt year-on-year with April accounting for 6.74mt when y-o-y rise was 29.72%. The average bauxite CIF (cost, insurance, freight) import prices for Chinese ports during April were \$51.21 a tonne, an increase of 18.74% from the same period last year. Indonesia's share of large April bauxite imports by China was 4.56mt. Explaining the phenomenon, *Shanghai Metal Market (SMM)* journal says in the absence of any clear indications as to whether Indonesia would opt for a blanket ban on unprocessed ore next year, Chinese alumina processors thought it wise to go for big imports for "fear of possible shortages in the future." Yet another factor that led to import spurt is the commissioning of new alumina capacity by Shandong Weiqiao Pioneering and Chongqing Bosai Minerals.

SMM further says Indonesian bauxite recommends itself to Chinese refineries for abundance of availability, good quality and low prices compared to other supply sources. In any case, large imports are justified on grounds that trihydrate bauxite found abroad is superior to Chinese monohydrate bauxite. What form Indonesian resource nationalism will finally take is still in grey area. The country's energy and mineral resources ministry has given indications that it will be ready to consider any suggestions relating to degrees of value addition to minerals, including bauxite. But mining companies not taking initiative in minerals processing beyond extraction might be barred from participating in export starting 2014, according to the ministry, which is promising reliable power supply and land for minerals downstream units.

Encouragingly for Indonesia, the world's leading aluminium producer United Co. Rusal of Russia has plans to build a refinery most likely in West Kalimantan where good quality bauxite is found in very large quantities. In its recent meeting with Indonesian trade minister, Rusal has indicated an investment of \$2bn to build a 1.8mt alumina refinery. Expect Rusal to secure tax concessions from the Indonesian government before it finally commits investment in the refinery. What it will also have to do is to sign binding agreements with local mining companies for feeding the proposed refinery with bauxite. Rusal has indicated that it will accord priority to local supply of alumina so that Indonesian imports, a strange phenomenon for a country with such plentiful bauxite deposits, are progressively curbed. The country's only smelter Inalum is now totally import dependent.

Incidentally, once before Rusal made attempts to build a refinery in West Kalimantan teaming up with government owned Aneka Tambang without success. "If Rusal sets its foot in Indonesia then expect other leading aluminium producers making attempts to build refineries there," says metals analyst Rohit Murthy. Aluminium leaders are all the time seeking greater integration cutting across country borders between downstream (smelting) and upstream activities like mining and refining. Like the Norwegian Norsk Hydro with presence throughout the aluminium value chain from bauxite mining to extruded and rolled products owns 91% of Alunorte refinery in Brazil with capacity of 6.3mt. Similarly, Alcoa owns a 4.2mt refinery in Australia. In a way, the world aluminium industry is ahead of steelmakers in integrated global operation.

Like Indonesia, India too is walking the path of discouraging bauxite exports without value addition. Prompted by the Federation of Indian Chambers of Commerce and Industry (FICCI), the Indian budget for 2013-14 introduced a 10% *ad valorem* export duty on the mineral. Was FICCI lobbying in response to China stepping up bauxite imports from India since early 2011? Chinese imports from India in 2012 doubled to



Vedanta Aluminium
managing director
Sushil Kr. Roongta.

1.3mt and arrival of India origin bauxite at Chinese ports in April last was an all time monthly high of 744,000 tonnes in a showing of attempts to beat Indian export duty.

Metals consulting firm CRU estimates the Indian export levy is adding about \$4 a tonne to bauxite cost. An industry official said the "government saw merit in FICCI demand in the context of difficulties in opening new bauxite mines and closure of a 1mt refinery of Vedanta Aluminium in Orissa since December." The last time India saw the opening of a large bauxite mine was nearly three decades ago at Orissa's Panchpatmali hills, says Vedanta Aluminium managing director Sushil Kr. Roongta. "Aren't we in a paradoxical situation that even while India has the world's fifth largest bauxite resource of 3bn tonnes, the country is constrained to realize its aluminium-making potential because of difficulties in opening new bauxite mines, thanks to regulatory issues and roadblocks created by NGOs," laments Roongta.

Murthy says, "like in iron ore China will continue to pursue acquisition of bauxite resources abroad from Mekong delta nations through Africa to South America. Acquisitions could be in the form of outright purchases of bauxite assets or by way of equity buying in mining companies. In the case of iron ore, China's medium-term target is to have at least half the imports coming from its owned overseas assets. A similar target for bauxite has not been spelt out. However, the world got an idea of how the Chinese mind is working when in 2008 the government-owned Chinalco wanted to invest \$19.5bn in Anglo-Australian Rio Tinto with a large aluminium portfolio that includes Alcan. It is another matter that Chinalco attempts met with a shock end."

Other Chinese enterprises, including public undertakings Minmetals and Chalco are all the time scouting for overseas bauxite resources. Chalco has revived its bid for rich bauxite deposits in Australia's Cape York Peninsula. Including Rio Tinto there are six other contenders for the asset for which interest has revived following Queensland government led by Liberal National Party dropped the condition of building an integrated alumina refinery in the downstream. Trading company Hongfan Industries with ownership of 42% in the 125,000-tonne Sichuan Qimingxing smelter is pursuing offtake possibility of up to 5mt

Upgrade for Canadian smelter

Engineering, procurement, construction, and project management specialist Bechtel is currently modernizing Rio Tinto Alcan's (RTA) 57-year-old Kitimat aluminium smelter in British Columbia, Canada. The modernization will create an environmentally superior, safer, and more productive smelter, elevating RTA's British Columbia operations entity to a world-class aluminium producer. Bechtel is responsible for engineering, procurement, and construction management of the project.

The modernization will employ the latest evolution in RTA's state-of-the-art Aluminum Pechiney (AP) Prebake technology. Production levels will be boosted to about 400,000 tonnes per year, and will reduce total environmental emissions by more than 40%, including some 500,000 tonnes of greenhouse gas emissions annually. The facility will have a design life of 35 to 50 years.

The modernized smelter will bring major economic benefits to Kitimat and the region, and as one of the most cost-effective smelters in the world, will be significantly less vulnerable to industry fluctuations. With the effort of more than 2,000 manual and non-manual personnel, the modernized smelter will produce first aluminum in Q1 of 2014, and will be in full production by Q3 of 2014.



of bauxite from Alufer's Bel Air project in Guinea. In the meantime, Alufer has brought its Bel Air project JORC compliant by linking it to a bauxite resource of 146mt with alumina content of 44.4% and 1.67% silica. Hongfan has struck long-term purchase agreements with some other bauxite groups.

Most standalone refineries and smelter cum refineries believe that the best way to find raw material (bauxite) security is by way of having captive mines. This has once again come to light as Dubai Aluminium (Dubal) and Abu Dhabi's Mubadala Development Company are acquiring the remaining portions of Guinea Aluminium Corporation (GAC) they don't already own. The move is seen as part of a grand strategy by UAE smelters Dubal and Emirates Aluminium Company (Emal) to secure long-term access to high quality bauxite in abundance. The Guinean government has approved the transfer of 33.3% holding each of BHP Billiton and Global Aluminium Corporation of the US in GAC to the two UAE enterprises in the hope that the proposed bauxite mining and alumina refinery project would as a result gain in pace. Dubal already owns 25% of GAC and Mubadala 8.33%. A spokesperson for Mubadala said, "upstream development is part of the UAE's aluminium strategy as we continue to build a global champion" in the industry.

Prolonged difficult times for commodities in general and its shift in focus from aluminium would explain BHP exit from GAC, which has mining concession covering 690km² in Guinea's prolific Boka bauxite region. For the GAC project, 19 bauxite bearing plateaus within the mining concession have been identified. Based on bauxite to be mined at Boka, GAC will have a refinery of 3.6mt capacity. Guinea wants an increasingly bigger percentage of bauxite mined to be processed into alumina in the country before exports. About 10% of mined Guinean bauxite is

value added to alumina.

The country is targeting 40% mined bauxite to be locally processed and GAC bringing into stream the alumina refinery following ownership restructuring will be a major step in that direction. In pursuit of the target, the Guinean government has signed an agreement with UC Rusal, the global leader in alumina and aluminium, which will translate into the Russian company developing Dian-Dian, the world's largest bauxite deposit, in phases. In the first phase, Rusal will open a bauxite mine with a 3mt capacity by 2015 end. During this period, Rusal will complete a feasibility study concerning lifting of mine capacity to 6mt as also for building a 1.2mt alumina refinery. In further steps, Rusal owning as many as 40 assets in 13 countries and five continents, will take Dian-Dian mining capacity to 12mt and alumina refining capacity to 2.4mt.

At the time of writing this article, Australian alumina spot prices were trading at \$325–331 a tonne, FOB (free on board) Australia, marking a fall of \$3 over May end. Significantly, in the wake of Norsk Hydro declaring a *force majeure* on June 12 following production disruptions caused by power outages at its 6.3mt Brazilian refinery Alunorte the differential between Atlantic and Australian alumina prices has substantially narrowed to about 50 cents a tonne against \$6.50 a tonne at June beginning. The alumina price outlook is to be seen in the context of some high cost smelters both in and outside China being forced out of production because of the white metal staying stubbornly well below \$2,000 a tonne. At current aluminium prices, around 25% smelter capacity is rendered unprofitable. No wonder from Chalco to Alcoa to Rusal, aluminium majors have announced varying degrees of capacity resting.

Brazilian imports of aluminium soar as demand continues to grow

No new aluminium smelter has been built in Brazil for 30 years, writes *Patrick Knight*. But with demand for the metal growing ever faster, imports are set to cost more than exports earn soon.

Because Brazil has not built any aluminium smelters for so long, to meet demand growing by about 7% a year, imports of the metal have soared.

Imports of primary aluminium, of scrap, and a growing share of finished products, mean the gap between what industry exports earn and imports cost, could fall to zero this year.

If it were not for the \$2.5 billion the export of bauxite and alumina now earns each year, the industry would already be in deficit.

Although some of the numerous taxes the industry has to pay for electricity have been reduced, cutting the price by 10–15%, the aluminium industry says that if a new smelter is to be built in Brazil, the cost of electricity needs to fall by about 30%.

With no new smelter planned for Brazil, the Rio Tinto company is adding insult to injury by proposing to build a 700,000 tonnes capacity smelter, to cost \$3.5 billions, in Brazil's tiny neighbour Paraguay.

Paraguay now sells most of its 50% share of the electricity generated at the huge Itaipu power station, on the Parana river, to Brazil. Only about 10% of the 12,000 Mws generated is used in Paraguay itself.

If the smelter went ahead, most of the Itaipu electricity Paraguay now sells to Brazil, and which is the country's main source of revenue, would be needed at the smelter.

While Brazil is the world's second-largest producer of bauxite, of which more than 40mt (million tonnes) is now mined each year, as well as the third largest producer of alumina, of which about 11mt is now produced, Paraguay produces none of either product. Both would have to be imported, probably from Brazil.

About 1.4mt of primary aluminium is now produced in Brazil each year, 200,000 tonnes less than six years ago. Several high cost smelters or elderly production lines have been shut down in the past few years.

New norms for the fuel efficiency of cars and trucks are gradually coming into force, while thousands of kilometres of long-distance transmission lines are being built to link new power stations in Amazonia with the places the electricity is needed.

The civil construction industry is going strong, while 80% of all the 25 billion cans sold in Brazil each year, are now made from aluminium.

As a result of all this activity, demand for the metal is now growing by about 7% a year. If this rate of growth continues, about 3.5mt of primary aluminium will be needed in Brazil by about 2025, more than twice as much as is used today.

This year Brazil will import about 300,000 tonnes of processed items, notably window frames and transmission cables. Only 70,000 tonnes of processed items were imported as recently as 2009.

More than 200,000 tonnes of primary aluminium will also be imported this year, again more than six times as much as in 2009, while 40,000 tonnes of scrap will come in, most coming



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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
2012	1,436	1,400	493,810	750,000	35,000	6,861	10,500	7,486
2011	1,440	1,440	486,827	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
2005	1,500	833	561,399	326,055	22,150	7,509	5,300	2,396

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

from neighbouring countries.

Apart from the high cost of electricity in Brazil, a main reason for the reluctance to invest is the fact that the world price of primary aluminium has been below the key \$2,000 a tonne mark for the past three years, which is close to the cost of production.

As a result investments have been few and far between.

The low price is mainly because China has increased its output of the metal six fold in the past 15 years.

But with virtually all the smelters in China now losing money, the news that the largest company there, Chalco, which like most smelters in China, is state owned, is to halt output a 300,000 tonnes capacity mill has changed the outlook for the better. The world aluminium price hardened on the news.

Primary aluminium and finished products are not the whole story for the aluminium complex in Brazil, which continues to be one of the world's leading suppliers of bauxite and alumina.

Despite the fact that companies such as Alcoa and Novelis are postponing making investments in new smelters, Brazil is a relatively calm part of the world.

For this reason, the largest companies are unlikely to pull out, even though they threaten to. They can be relied on to keep the largest and lowest cost smelters there going, even if they are more costly to run than those in the Middle East or Africa, where companies take advantage of the low cost of energy, but where security continues to be a problem.

However much the companies complain, usually because they want to persuade the Brazilian government to aid them, new bauxite mines are being opened and output at existing ones increased. More alumina is being made and exported each year as well.

Alcoa will mine about 4mt of bauxite this year from its 'Juruti' mine, adjacent to the main Amazon river, navigable for very large vessels at this point. Alcoa claims to be losing money at a mine which first opened in 2009, and where ideally, output needs to rise to about 12mt to achieve economies of scale.

Alcoa says it cannot afford to make the investments needed for this, claiming that demand for bauxite and the alumina made from it, is growing too slowly to justify the expense.

However, at the same time as Alcoa is holding back, the Votorantim company, which like all the others in the industry, has been adding processing capacity, rather than building new smelting capacity, plans to open a brand new bauxite and alumina project in the Amazon region, where most of Brazil's massive bauxite reserves are concentrated.

At the moment, the average car sold in Brazil, the majority

powered by engines of only one litre capacity, contains about 50kg of aluminium. With more than three million cars, buses and trucks now being sold in Brazil each year, the motor industry now uses about 150,000 tonnes a year.

The larger cars made in the United States and Europe use about 150kg of aluminium each.

New regulations aimed at increasing the efficiency of engines, both regarding the emission of carbon and also the amount of fuel they use, will oblige assemblers to use more aluminium from now on, to keep down weight.

The lighter the car, the less fuel it uses, so it already makes sense to pay a little more for a new car, and save on the cost of fuel over a year or two.

New regulations restricting the number of hours truck drivers may remain at the wheel and the frequency of rest breaks, aimed partly at cutting the horrific toll on the roads in Brazil, where 80,000 now die each year, will mean that up to 20% more trucks will be needed to carry the same amount of goods as before.

New restrictions regarding the maximum weight each goods vehicle can carry, plus its own weight to 75 tonnes, will have a similar effect.

To compensate for the new weight restriction, using more costly aluminium for bodywork, in preference to steel, means each truck is able to carry up to five tonnes more goods than if it had a steel bodywork.

Some industries, notably sugar, which moves about 650mt of cane from the fields to mills each year, has already begun to switch from steel to aluminium in their trucks, to allow them to carry more. Pulp mills which between them carry up to 40mt of wood from forests to mills, are doing the same.

Work has begun in Sao Paulo on building one of the world's first mass transit monorails. Because monorails run on rubber tyres, rather than on a steel track, the weight of carriages is critical. So aluminium, rather than steel, will be used for bodywork.

Twenty-five billion aluminium cans will be sold in Brazil this year, twice as many as a decade ago. Because restrictions regarding drinking and driving have been tightened, the sale of beer in bars and restaurants, where bottles are more popular than cans, has been falling steadily. Sales of canned beer in supermarkets, to be drunk at home, on the other hand, have been gaining ground.

Brazil world leader in the proportion of cans which are recycled and 98% of all cans are now recovered by an army of collectors.

ICS launches free guidance to shipowners

The International Chamber of Shipping (ICS) has published new guidance for shipowners on how shipping companies and crews can implement an effective 'safety culture'.

The new ICS Guidelines, being distributed free of charge throughout the industry, were launched at a reception in early June, sponsored by ICS, for Governments attending the IMO Symposium on the Future of Ship Safety in London.

ICS Secretary General, Peter Hinchliffe, explained: "Our brochure is intended to provide some basic advice to companies on the successful implementation of an effective safety culture. This covers the vital need for all concerned, at sea and ashore, to understand the relationship between unsafe acts and serious incidents that may result with loss of life. In particular our brochure emphasizes the need to change behaviour and to avoid negative attitudes and complacency."

The new ICS brochure explains that there are three essential components to developing a safety culture: commitment from the top, measuring performance, and then modifying behaviour. The brochure also stresses the importance of accident and 'near miss' reporting, and the establishment of a 'just culture' approach whereby shipping company personnel are encouraged to provide essential safety related information whenever something might have gone wrong, but without fear of punishment.

Hinchliffe added: "Repeated analysis demonstrates that serious accidents in shipping are nearly always due to a failure to follow established procedures. Our goal is to ensure that all company personnel believe in safety, think safety and are committed to safety. Hopefully our new brochure will contribute to this objective."

Contract awarded for alternative Panama Canal

Nicaragua has awarded a Chinese company a 100-year concession to build an alternative to the Panama Canal, in a step that looks set to have profound geopolitical ramifications.

The president of the country's national assembly, Rene Nuñez, announced the \$40bn (£26bn) project, which will reinforce Beijing's growing influence on global trade and weaken US dominance over the key shipping route between the Pacific and Atlantic oceans.

The name of the company and other details have yet to be released, but the opposition congressman Luis Callejas said the government planned to grant a 100-year lease to the Chinese operator.

The national assembly will soon debate two bills on the project, including an outline for an environmental impact assessment.

Nicaragua's president, Daniel Ortega, said recently that the new channel would be built through the waters of Lake Nicaragua. The new route will be a higher-capacity alternative to the 99-year-old Panama Canal, which is currently being widened at the cost of \$5.2bn.

Last year, the Nicaraguan government noted that the new canal should be able to allow passage for mega-container ships with a dead weight of up to 250,000 tonnes. This is more than double the size of the vessels that will be able to pass through the Panama Canal after its expansion, it said.

According to a bill submitted to congress last year, Nicaragua's canal will be 22 metres deep and 286km (178 miles) long — bigger than Panama and Suez in all dimensions.

Under the initial plans for the project, the government was expected to be the majority shareholder, with construction taking ten years and the first ship passing



The Panama Canal.

through the canal within six years. It is unclear if this is still the case.

Two former Colombian officials recently accused China of influencing the international court of justice to secure the territorial waters that Nicaragua needs for the project.

In an op-ed piece for the magazine *Semana*, Noemí Sanín, a former Colombian foreign secretary, and Miguel Ceballos, a former vice-minister of justice, said a Chinese judge had settled in Nicaragua's favour on a 13-year-old dispute over 75,000 square kilometres of sea.

They said this took place soon after Nicaraguan officials signed a memorandum of understanding last September with Wang Jing, the chairman of Xinwei Telecom and president of the newly established Hong Kong firm HK Nicaragua Canal Development Investment Company, to build and operate the canal. Nicaragua has accused Colombia and Costa Rica, which has a claim on territory likely to be used by the new canal, of trying to prevent the project going ahead.

International Chamber of Shipping appoints vice chairman

Singapore Shipping Association Honorary Secretary and International Committee Chairman Esben Poulsson has been elected as a vice chairman of the International Chamber of Shipping (ICS).

His election took place at the ICS's recent Annual General Meeting in Oslo. He joins three other vice chairmen for 2013–2015: John C Lyras (Greece), Karin Orsel (Netherlands) and Gerardo Borrromeo (Philippines).

The SSA is an active member of the ICS and Poulsson has, in the past, represented the ICS at a number of industry meetings in Asia. He sees his appointment as an opportunity for the Singapore voice to be heard internationally.

He said: "The SSA is committed to making a meaningful contribution to the working of the ICS and I hope that through my appointment, I can add value to this effort.

"Singapore has become a major international maritime centre

and so it is not only important for its voice to be heard internationally but for Singapore to help influence the growth and development of world shipping," he added.

The Singapore Shipping Association (SSA) represents more than 450 shipping companies and other businesses allied to the shipping industry. It is a national trade association formed in 1985 to serve and promote the interests of its members which comprise shipowners and operators, ship managers, ship agents and other ancillary companies such as shipbrokers, classification societies, marine insurers, bunker suppliers, maritime lawyers, and shipping bankers amongst others.

SSA works closely with the Maritime and Port Authority of Singapore to promote Singapore as a leading maritime centre, and also with the Asian Shipowners Forum and other fellow shipping associations in the region with the goal of speaking with a unified Asian voice.

ISS launches Advanced Cargo Information department for Canadian ports

Major maritime services provider Inchcape Shipping Services (ISS) has launched an Advanced Cargo Information (ACI) department for Canadian ports following new regulations and procedures for cargo and vessel reporting by the CBSA (Canada Border Services Agency).

Based in Montreal, Canada, the centralized ISS ACI department will offer expert guidance on all cargo and reporting requirements to shipowners or charterers with vessels arriving at Canadian ports.

Services provided by the new ACI department will include assistance in obtaining a carrier code, advance manifesting for all Canadian Ports and, if required, conveyance reporting and arrival messaging. Several major carriers have already

subscribed to the service.

New CBSA regulations and procedures include a new Conveyance Arrival Certification Message (CACM) introduced on 9 June 2013 for applicable marine conveyance arrivals, such as vessels arriving with cargo for discharge or with freight remaining on board. Marine carriers or their authorized service providers are now required to transmit a CACM message via an Electronic Data Interchange (EDI) method to the CBSA.

Says Jason Skorski, ISS General Manager, Eastern Canada: "With the CBSA's regulations and procedures now under way, the new ACI service will enable owners and charterers to meet all ACI needs simply and efficiently."

RINA approves new OSV rules and environment notations

International classification society RINA has launched new rules for Offshore Support Vessels, new environmental notations covering cargo handling and transshipment operations and a new guide on complete ship model calculation of passenger ships.

All these initiatives were approved at a meeting of RINA's technical committee held in Genoa in early June.

Of particular interest are the environmental notations relating to the impact of dry cargo handling systems. These respond to demands from transshipment and bulk port operators in sensitive areas which wish to demonstrate environmental responsibility and high standards of minimizing airborne pollution from cargo handling.

The following two new additional class notations may be granted:

❖ **GC CARGO HANDLING (Green and certified cargo handling systems):** to ships provided with systems for handling solid bulk cargo which may be source of sea or air pollution (e.g. those handling coal, iron ore, sulphur, etc.), designed, tested and installed according to Part F Ch 7 Sec 6 to minimize their environmental impact.

❖ **GREEN PLUS T: to transshipment units:**

❑ intended to operate at a fixed location;

❑ complying with the provisions for the assignment of the GREEN PLUS notation; and

❑ complying with the provisions for the assignment of the GC CARGO HANDLING (Green and certified cargo handling systems) notation.

RINA Services S.p.A. is the RINA Group's company active in ship classification, testing, inspection and certification services. RINA Group is a multi-national group which delivers verification, certification, conformity assessment, ship classification, environmental enhancement, product testing, site and vendor supervision, training and engineering consultancy across a wide range of industries and services.

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Bulker classification



ushering in the new era of the 'eco ship'

Historically low freight rates are increasing the pressure on vessel operators to reduce costs. This is creating new safety risks but also pushing ship design parameters and encouraging innovation, writes **Michael King**.

In a low freight environment it is not surprising that owners are seeking commercial advantage where they can find it. What is unusual is that one of the tactics being deployed to achieve this is the ordering of new ships, adding capacity to a market already devastated by an excess of vessels.

Owners with big pockets or access to capital markets are buying new ships for a number of reasons. Some are seeking a competitive advantage by reducing their fuel costs through the deployment of more efficient 'eco' designs. These designs typically incorporate more efficient hull lines, and machinery and propulsion systems that slash fuel requirements and help meet more stringent emissions regulations.

For other buyers the economies of scale generated by deploying larger ships and/or locking in forward freight costs is a strong 'pull'.

Both trends are only possible, of course, due to the record low newbuilding prices available at yards in China and elsewhere which are tempting owners even in a depressed market.

"ECO ships are more economical to operate," said Nick Brown, marine communications manager at Lloyd's Register. "No owner is going to a yard saying they would like to order designs from a few years ago. They are simply the ships available today. We expect to see demand for further economies continuing."

The change is forcing classification societies to focus less on traditional areas of expertise such as hull and mechanical certification and become more involved in verification in the

areas of operational and environmental performance, according to Howard Fireman, vice president of Operational and Environmental Performance at ABS.

"From a technology perspective, we see that the industry is now going through a period of significant but incremental change principally driven by increasing fuel costs and regulations," he said. "This is witnessed by new ships having progressively cleaner air emissions and higher energy efficiency, which impacts future commercial decisions.

"In the long term, this will require class societies to identify risk-based, more efficient, less intrusive, technology-driven and monitoring-based processes."

DNV is currently working on a number of major new bulk carrier designs which incorporate the latest 'ECO' technology. "We believe that it is likely that the era of cheap fuel is over in the short to medium term," said DNV Bulk Carrier Segment Director Michael Aasland. "Fuel efficiency is therefore here to stay, both in order to reduce costs of operation but also in order to make shipping an even more environmentally friendly mode of transport."

The common theme across DNV's new concept designs is the constant desire to reduce fuel consumption. This is achieved through the optimization of hull lines through extensive use of Computation Fluid Dynamic tools, and use of the latest engine technology and fuel efficiency devices.

'Oshima ECO-Ship 2020', for example, is an Open Hatch Bulk Carrier developed as a joint project by DNV and Oshima Shipbuilding and designed to emit 60% less CO₂ than standard designs. It features a wide twin skeg hull fitted with Oshima's 'Seaworthy' bow and air lubrication system, a waste heat recovery system and a twin screw redundant propulsion system.

It also boasts an LNG single-fuel solution designed with Rolls Royce and a lean-burn 4-stroke medium speed natural gas engine.

The idea behind the design and the use of LNG is to 'forward proof' vessels against more stringent environmental regulations expected to be introduced by 2020, not least those restricting heavy fuel usage in Emission Control Areas. Because LNG contains no sulphur and the LNG combustion process emits 90% less NO_x and eliminates almost all particulate emissions, DNV concluded this was the most efficient fuel. Moreover, DNV takes the view that cost of the system — expensive at present — is likely to fall significantly in the future.

The ship's design also assumes that slow steaming strategies are here to stay because fuel prices will remain high. The 'Oshima' has a design speed of just 14.5 knots to aid the reduction of fuel consumption. "Reduced design speed allows for a wide hull form and a twin screw propulsion system with high propulsive efficiency," said Aasland. "High propulsive efficiency along with low hull resistance and fuel consumption are the main features of the design."

However, while slowing ships down and using innovative fuel and fuel systems can help improve efficiency, a number of those contacted for this article by DCI expressed apprehension about some of the latest ECO ship designs, not least due to the potential danger posed by under-powered vessels. "There is a concern that lower engine power may result in safety issues if this is taken to extremes," admits Aasland.

Fireman said ABS was now working with IACS and other industry partners to finalize IMO recommendations for minimum powering. "This is intended to address the concern that decreases in fuel consumption can be achieved through the use of under-sized main engines," he added.

Classification societies also have mixed views on whether bulk carriers will continue to get larger. The attraction of bigger ships is easy to pinpoint: "Large ships have an advantage from an economy of scale point of view, which is not unimportant in these times of high fuel prices," said Aasland.

Vale's fleet of 'Valemax' very large ore carriers (VLOC) designed to carry ore from Brazil are up to 400,000dwt in size and have changed the dynamics of the iron ore trade.

"The Valemaxes are very special ships and they were ordered by Vale in order to render the company's iron ore exports to China more competitive compared to Australian exports," said Konstantinos Chatzitoliou, Manager for Bulk Carriers at Bureau Veritas. "This is the case usually for very big ships which are built for a specific job in mind. Their success depends on the success of this job. In the case of the Valemaxes, their competitive advantage was lost the moment they set to seas due to their ban from Chinese ports."

Chatzitoliou thinks it is unlikely more orders for VLOCs will be placed even though newbuilding prices have flat-lined in the past few months, at least until they are admitted to berth with full cargo holds at Chinese ports.

But he warns those that are tempted by low prices to

understand that structural stresses and dangers increase in line with the size of the ship. "The hull girder loads increase with size and also the ship becomes more prone to hydro-elastic phenomena like whipping and springing at ultra large dimensions," he said. "If whipping is not taken into consideration when designing ultra large ships, which can become very elastic, then there is a risk of catastrophic failure and hull girder collapse from extreme slamming loads.

"Springing on the other hand adds significant fatigue damage to certain details of the ship which are already prone to fatigue like hatch corners. Proper software tools and clear methodology are needed to examine accurately the hydro elastic effects on large vessels."

To this end, BV has developed a comprehensive methodology and advanced HOMER software in order to assess the hydro-elastic effects of whipping and springing on big ships. "Our calculations on recent ore carriers show that the additional stresses due to the ship's elasticity are not negligible and for this size of ship the traditional rigid approach is not sufficient," he said.

BV is currently studying the latest iron ore carrier designs and their ability to withstand the loads imposed by fast loading rates. The society is also offering ship owners the opportunity to have their ships examined for use with high speed single-pour loading techniques which can

reduce considerably the time spent at ports. Those that pass the exam can earn the additional class notation — SINGLEPASSLOADING.

"Heavy cargoes, grab loading and fast loading rates paint the picture of a very demanding service life," said Chatzitoliou. "Alternate loading conditions with heavy cargoes increase the hull girder loads. Fast loading rates of heavy cargo, which is a usual practice in many ports, can damage the ship with sometimes severe results. Most of the times this is due to local strength problems and the inability of the ballast pumps to de-ballast the ship compared to the faster shiploaders."

Dino Cervetto, Head of Technical Services at RINA Services, believes the technology is already available to build bigger bulkers safely, although he admits the market does not need these vessels at present.

"Perhaps there will be demand for more if and when Vale is able to berth their ships in China," he told DCI. "If that does happen, then the big issue is to be sure what the loads on the structure are. Each new design will need a sea keeping load analysis associated with spectral fatigue analyses to get that right, and a full structural analysis. It is a lot of work but it can be done and the tools we have are really reliable to support a skilled and experienced engineering judgement of the results."

He also raised the issue of loading rates and the stresses these are placing on bulk carrier structures. "Ports are loading faster and faster and we as class cannot control or even influence that," he said. "We see two main issues, local impact on the structure and the capacity of the ballast system to cope with the loading speeds and also maintain stresses within the loading conditions."



*Michael Aasland,
DNV Bulk Carrier
Segment Director.*

Jammed roads highlight the urgent need for improved infrastructure in Brazil.



taking cargo off busy roads

Chaos on Brazil's clogged roads highlights urgent need for more rail and barge

The year 2013 is proving a disastrous one for logistics in Brazil, where a grains crop of 185mt (million tonnes), 20mt more than last year, is being harvested, writes *Patrick Knight*.

With roads clogged, ports jammed and railways overloaded, huge backlogs are building up and costs are soaring.

A 50km-long queue of trucks waiting to unload soya, corn and sugar blocked access to the port of Santos on a day at the end of May.

The port normally handles about 10,000 trucks each day. However, as result of restrictions at patios, the journey down the escarpment to Santos from Sao Paulo city took eight hours, rather than the usual 60 minutes.

During most of May as well, more than 100 ships were waiting to load grains and sugar at Santos. Some had been in the queue for two weeks, at a cost of about \$45,000 in demurrage per ship each day.

Desperate to get cargoes to destinations on time, many shippers are resorting to loading low value bulk cargoes into containers and sending them to Santos by rail.

Such cargoes then leave Brazil in container ships, rather than

bulk carriers, beating the queues and congestion by this means.

This unlikely solution is possible because the massive inflow of consumer goods from China and elsewhere, means hundreds of containers which would otherwise leave Santos empty, are available.

So, for the time being at least, shippers get cut-price rates for grains and sugar. Coffee worth \$5,000 a tonne has been carried in containers for years. But corn valued only \$250 a tonne? Sounds crazy, but such is Brazil.

The congestion is adding several days to the 4,000km round trip to bring soya and maize from centre west states such as Mato Grosso to the ports. As a result, the cost of getting a tonne of soya to Santos has shot to about \$150, 30% higher than last year.

This is eating into farmers' profits at a time when the price of grains is falling.

Last year, a smaller-than-expected soya crop allowed Brazil to export 20mt of corn, a crop which in many previous years was imported. Corn exports earned a record \$5 billion dollars in 2012.

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Just as much corn will be harvested this year as in 2012. But the extra 20mt of soya will clog ports at least until mid August. After that, a record US corn crop will hit the market, causing prices to fall. As a result, not more than about 12mt of corn will be shipped this year and farmers face large losses as a result.

Because access to the ports in the north and north east of the country is now so poor, most of what the extra being produced in those fast growing parts of the country, has no alternative but to travel south, the great majority by road.

To ease this situation, major investments need to be made in building and improving railways, which now carry only 24% of the goods moved round Brazil. Almost 80% of that is iron ore.

If just a few locks were built and rivers dredged, the rivers could easily handle several times the 10% of the total they now do as well.

With ever more soya and corn needed by China, analysts calculate that 110mt of soya, as well as 100mt of corn will have to be grown in Brazil by 2020, 40mt more than this year.

For the past 20 years, Brazil's complacent government has pared spending on infrastructure to only about 2% of GDP each year. This compares with the 6–7% of GDP which China spends on infrastructure.

The result has been that virtually no new rail track has been laid and nothing done to improve Brazil's extensive waterway network, while roads have crumbled.

Brazil is becoming ever more dependent on the earnings from exports of farm commodities, notably soya and sugar, as well as meats. This has caused the government to belatedly realize that something must be done to improve logistics, if the situation is not to breakdown completely.

There is some good news. Notably, improvements on the 2,000km BR-163 road, which links the capital of leading soy producing state Mato Grosso with the Amazon river port of Santarem, are allowing access to a brand new port being built on the Tapajos river, Miritituba.

Miritituba is 350km upstream from Santarem, on the Amazon, and which now handles about 2mt of grains a year. Fleets of barges are already being moved into position to carry up to two million more tonnes of soya and corn from Miritituba to Santarem. Some of the grain will continue downstream to the ports of Vila do Conde, Outeiro and Santana, a new port being built on the channel to the north of Marajo island, in the Amazon delta.

It takes two or three days less to transport a cargo from the Amazon region to China, which now buys 70% of the soya beans shipped from Brail each year, than it does from Santos or Paranagua.

In the past 15 years, the Brazilian economy has been boosted

by encouraging consumption, rather than investment.

One example of this is that 15,000 brand new cars come onto the roads each day, making already acute traffic congestion more severe.

Partly because of the horrific traffic toll, with 80,000 people killed on the roads each year, new legislation limiting the number of hours trucks can operate each day, has been introduced.

The downside of this new regulations is that journey times are taking up to 20% more than before, which is adding to costs.

Brazil is home to two of the world's most efficient and intensively used railways, both of them operated by the Vale iron ore company and used to carry 250mt of ore from mines to the coast each year. This shows it can be done when it is essential.

Because of this example, it might be thought that it would not take long for three badly needed new railways now being built to be completed, given the urgent need for them.

But the opposite is the case and Vale's efficient railways are very much the exception.

Work started on building the 'North–South' railway, which starts half way along Vale's 900km Carajas line, in 1987. This line will eventually run more than 2,200km south through tens of millions of hectares of arable land, to link with existing lines in Sao Paulo state, then on to Parana and Rio Grande states. This will allow the millions of tonnes of corn needed to feed the flocks of chickens and herds of pigs concentrated in this region, to get there more cheaply.

But 26 years after work began, only 250km of the North–South line is operational. It is used to carry about 2mt of soya to the port of Itaquai each year.

A further 850km of track has been laid by a state owned company. But it has now come to light that because the track bed was not laid properly and drainage was inadequate, many sleepers have already rotted and embankments have been eroded.

In addition, steel rails imported from China have been found to be of poor quality, and will have to be replaced.

Heads have rolled amidst allegations of widespread corruption, although nobody is behind bars. Most importantly, however, the line is still far from ready. Much of the faulty stretch will have to be completely re-laid, at an estimated, but certainly conservative cost of \$400 million.

Things are only slightly better on two east west lines, on which work started in 2007. The two 1,200km lines will eventually link the Atlantic ports of Pecem, Suape and Ilheus, with the North–South line itself. Both these lines run through important soy and corn producing regions on the way and will eventually allow new deposits of iron ore, as well as gypsum, to be opened up.



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When building these lines began, it was announced with a fanfare they would be completed in three or four years' time.

But as is usually the case, the work has got bogged down. Way leaves have not been obtained, planning permission from the ministry of the environment was now obtained, and funds have run out. Both lines will cost four or five times the initial estimates.

If these two were the only lines to be built, there might be some hope that progress might be made and that scarce resources, both financial and managerial, would be available.

But the government has now announced not only that Brazil's first high speed line to link the countries two major cities, Rio de Janeiro and Sao Paulo is to be built, probably at a cost of \$30 billion, a network of other high speed lines are to be built to link satellite cities to Sao Paulo as well.

As a result of this sudden enthusiasm for rail, scarce resources are likely to be thin on the ground. This is bad news for the transport of grains, which should be top priority.

A new generation of hydro-electric power stations are now being built on several of the very large rivers which rise on the central plateau where most grains are grown, before flowing down to the Amazon river, falling several hundred metres in the process.

Because of a long-standing dispute between the ministry of energy, responsible for building the power plants themselves, and the ministry of transport, responsible for navigation over who should pay, locks which would allow barges to transport grains and other goods down to the Amazon, navigable to the largest vessels, have not been built at the same time as the power stations.

The only river in Amazonia now navigable, is the Madeira, which runs close to Brazil's border with Bolivia. Four to five million tonnes of the soya grown in western Mato Grosso, and Rondonia, travel to the Amazon ports of Itacoatiara and Santarem along this route.

Ingram Barge Company leads the way in environmental stewardship

Ingram Barge Company (Ingram) has been a quality marine transporter on America's inland waterways since 1946, and has grown to become a pre-eminent carrier on America's inland waterways. Ingram owns nearly 4,700 barges; those barges are powered by an industry-leading towboat fleet, which includes approximately 150 towboats that are maintained at the highest level of standards. They transport a high volume of dry bulk commodities, including coal, aggregates, grain, fertilizer, ores, alloys, and steel products, as well as liquid bulk cargoes on over 4,500 miles of America's inland waterways system.

As a waterways transportation business, Ingram is a company that bases its livelihood directly on natural resources. It's always been in the company's best interests to engage in sustainable practices and to focus on the education of future generations about the importance of protecting and preserving the nation's waterways, from the smallest stream to the largest river. The US river system is an incredible resource that brings stability and prosperity to the global economy. Barge transportation not only supports the communities along the waterways; its economic impacts reach far beyond the river banks. Only a small portion of US waterways are being used to their fullest advantage — there remain many opportunities to harness the power of the rivers.

Remaining an industry leader in environmental stewardship is a commitment Ingram takes seriously. For its customers, this

But the volume using the Madeira, where no locks are needed, is limited. Again, the authorities cannot agree as to who is to pay for dredging a river whose flow varies greatly from month to month, so which silts up. Nor can agreement be reached as to who is to install buoys which would allow the river to be used at night, and allow it to carry twice as much as it now does.

Two 30-metre locks were built at a cost of \$750 million on the Tocantins river, adjacent to the Tucuruí power station, Brazil's largest, three years ago.

But several other locks must be built and rocks blasted from the river bed, if the waterway, which could easily carry tens of millions of tonnes of grains a year, is to be usable.

The Tucuruí locks would have cost only a fraction of what they did, had they been built at the same time as the power station, when thousands of workers were on site.

But the lessons have not been learned, and no other locks are now being built. If just 27 locks were built on rivers where power stations are being built or are planned, grains could be moved from farms to ports for a cost of only about \$30 per tonne. This is 20% of what it now costs to get a tonne of soya or corn to Santos or Paranaguá. Some soya even travels a further 1,000km south to the port of Rio Grande, an a costly option which is resorted to when Santos and Paranaguá are as congested as they have been this year.

Governments in Brazil have relied on stimulating consumption, as a way of achieving growth in the past few years. Only about 17% of Brazil's GDP is invested each year.

There is little chance of Brazil changing its profligate ways. But with industry unable to compete, it has become clear that the country will have to rely increasingly on the earnings from the commodities it can grow or mine.

To allow this to continue, much more is going to have to be spent on the infrastructure as a whole, and on railways and waterways in particular, than is now the case.



means moving more cargo over greater distances, using less energy and water, and creating less waste. For Ingram's

associates and the community, it means doing so in the safest manner as well.

As the largest carrier on the inland waterway system, Ingram feels responsibility to lead in environmental sustainability. The core values of Ingram Barge Company are: teamwork, family pride, customer satisfaction and zero harm. These values encompass Ingram's commitment to be a good environmental steward. Ingram's sustainability initiative, ENcompass, builds on Ingram's past performance and charts a continued course of improved environmental operations. Ingram has developed policies and operating practices that enhance the competitiveness of the company while simultaneously advancing the economic and social conditions in the communities where operating, and beyond. Ingram initiatives focus on improving environmental performance and the bottom line using this environmental compass.

Ingram's ENcompass strategy has been recognized by the US Environmental Protection Agency (EPA) and the US Coast Guard (USCG). In 2010, Ingram was named the first marine transportation partner in the EPA SmartWay programme. In 2011, Ingram received the EPA's Southeast Diesel Collaborative Award for emissions reduction innovation. In 2012, Ingram was awarded the USCG's William M. Benkert Marine Environment Protection Gold award. This biennial award recognizes outstanding marine environmental achievements that go beyond mere compliance of industry and regulatory standards.

CEO Craig Philip is very pleased with the progress the



The William M. Benkert award.



EPA's Southeast Diesel Collaborative Award.

company is making towards becoming known for its sustainable practice. "It gives me great pleasure and pride to know that Ingram has been recognized and accepted into the EPA's SmartWay Program as one of the first marine transportation companies," Philip said. "Ingram is proud to be on the cutting edge of developing new policies and procedures for marine transportation companies as they relate to the environmental issues at hand. Barge transportation is already the greenest and safest mode of bulk freight transport, and we will continue to lead the industry to take care of our environment."

Ingram leads the industry by achieving environmental goals four years early! Ingram posted an 11.8% increase in fuel efficiency while moving a loaded tonne mile 73 more miles per gallon of diesel versus industry standards. This exceeds original goals set for 2017.

Ingram has partnered with diverse stakeholders committed to environment improvements, such as America's Great Watershed Initiative, Great Rivers Partnership, The Nature Conservancy, Living Lands and Waters, and the Cumberland River Compact. Engaging stakeholders to provide awareness and understanding of Ingram's leadership and commitment to responsible navigation, communities and the environment is helping to build a better tomorrow. Ingram has innovatively bridged the chasm between goals and principles of sustainability through action and commitment, now and in the future.



Negotiating river transport risks



river: loaded convoys must be timed to match the window of deeper water or suffer substantial, unacceptable, delay. Those same tides also reshape sand banks, moving them bodily over a surprisingly short time, demanding constant vigilance from even the most seasoned navigator.

Wash presents a rather unique challenge. Whilst attempting to achieve the quickest passage, consideration must be given to the effects of wash. Perhaps one of the least appreciated but most important aspects of river navigation is the impact on river communities. As a convoy passes a settlement, wash inevitably finds its way ashore. Whilst a reduction in speed may be the only answer to reduce wash, some speed

Conundrum.

noun: a confusing and difficult problem (Oxford English Dictionary)

“The river was even narrower now, and seemed to curl back on itself before swinging round in a series of hairpin bends. It must have been a brave man who first sent the tugs down here, with their barges out front. It was like trying to squeeze a warehouse down a woodland path. At any moment we could have become jammed fast or torn in two. The Master said that these were some of the most difficult waterways he’d ever known.”

(Reprinted by kind permission from ‘Wild Coast’ by John Gimlette and available at www.profilebooks.com)

The great conundrum in river transport is neatly captured in this extract from travel writer John Gimlette’s experience aboard one of JP Knight’s push tugs on a four-river system in Suriname, South America, writes Richard Knight, JP Knight (Paranam) Ltd.

It is a simple enough question after all. ‘What is the most tonnage we can move at any one time in the largest propelled unit that still fits the least space available?’ The question becomes a conundrum because of the objective: to deliver that tonnage at the lowest cost in the safest manner with minimal or no environmental impact.

SO WHAT ARE THE LIMITING FACTORS?

On Suriname’s rivers, you can take your pick...

First and perhaps predictably, there’s depth of water — or rather the lack of it. This translates as under-keel clearance, sometimes as little as 30cm; roughly the length of this page. River levels inevitably reduce in the dry season with a knock-on consequence on the effective capacity of the barges.

Grounding is all but unavoidable, loaded barges take the brunt of the damage from the mine, but on the return passage the tug’s hull is usually deeper in the water than the empty barges and keel cooling systems become vulnerable.

Then there’s tide. These are not canals, nor are they the sea; the tidal ebb and flow runs at differing speeds in differing locations. Where one river meets the estuary, another cuts across it to drive the immense body of water at over four knots up or down the Suriname River. A bar lies at the exit of one

allows a single complete turn as opposed to the ‘back and fill’ manoeuvre favoured on the Mississippi using the tug’s flanking or forward rudders. The balance is therefore a delicate one, and of utmost importance, as those communities also operate minimal freeboard canoes ferrying dozens of school children on the same river sections. Additionally, the river bank divests itself of trees into the river as a naturally-occurring process. These are no ordinary trees. Mangrove, as any will tell you who have encountered these fibrous-rooted brick walls, pose a major threat. I have witnessed a rudder split in two by one such disarmingly slight, errant, root.

This brings me to height of eye and the view ahead. It is generally accepted that a minimum safe distance to see ‘ahead’ of and therefore over the barge convoy is two convoy lengths. Even this measure means that there is a blind spot — or shadow — of some 400 feet in the case of JP Knight’s operation. We operate one tug, known locally as the *Giraffe*, that has a wheelhouse as high as the tug is long. Naturally the vision forward is exceptional, but it is also rare in river transportation. On the Rhine, for example, wheelhouses are repeatedly ducking down to transit low bridges only to shoot up again once the obstacle is cleared. On our river system such compromise is not currently needed: but vision is nonetheless a major factor during night transits in the absence of any illuminated navigational beacons or shore lights. During darkness it is close to impossible to differentiate between the river, the bank and the sky unless searchlights are employed, though these tend to destroy perhaps a more valued quality; night vision.

Whilst an army may march on its stomach, in river transport it sails on its quota of sleep. River transport is as continual an activity as it is possible to imagine. This is how vast tonnages are amassed: by the inexorable accumulation of cargo day in day out. So I determined that a system of operation had to be devised that best delivered an acceptable pattern of work, audited to international standards, offering a safe operating environment to all crew members. This system, JP Knight’s safety management system, has been consistently audited by Lloyd’s Register to the International Safety Management Code since 1996 and was the first of its type in the world. It enshrined a work rhythm, written by the crews and officers themselves that ensured safe operations in any given circumstance. One and a half million nautical miles later, it still does.



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Valemax bulk carrier returns to Chinese ports

A Valemax bulk carrier belonging to the Brazilian company CVRD has entered a port on China's West Coast for the first time since the start of 2012. To prevent 'disloyal competition', the Chinese government banned all further calls from such vessels as of the end of January 2012. However, the 400,000dwt *Vale Malaysia* was allowed to recently make use of the port of Lianyungang, after having discharged a consignment of iron ore.

Barry Cross

Grain terminal opens in Odessa

The first phase development of a grain terminal at the port of Odessa, in Ukraine, has been inaugurated. It has silos that are able to store 72,400 tonnes of grain and is due to become operational later this year.

The new grain terminal is being constructed by the port itself in partnership with Brooklyn-Kiev, with both entities supplying the same finance. Once fully operational, the complex will be able to store 240,000 tonnes of grain and have an annual capacity of up to 3 million tonnes. It will become one of the most advanced of its kind in the Black Sea.

BC

Salalah plans dry bulk facilities

The port of Salalah in Oman is to redevelop its old general cargo terminal, part of which will be used as a limestone stockpile area and also for the handling of both coal and iron ore. This project is being taken forward by the Ministry of Transport and Communications, which is shortly to contract consultancy to provide the necessary design services.

BC

Coquimbo to build dry bulk terminal

The Chilean port of Coquimbo has announced a project to build a berth to handle the shipment of dry bulk commodities. Terminal Puerto Coquimbo (TPC), which has links to the Von Appen group, plans to build the facility to the north of the existing Berth 2 and will invest approximately \$86 million. TPC currently handles around 60,000 tonnes of bulk each month, mostly copper concentrate (40,000 tonnes) and iron (20,000 tonnes). The new facility, which will take around 23 months to complete, will have capacity to handle 32,400 tonnes daily.

BC

Guadalfeo to enter Port of Motril

The Guadalfeo sugar company is seeking a concession to operate a warehouse at the port of Motril. This will occupy an area of 6,547m² in the logistics area of the port. It will be used for the storage of both alcohol and molasses.

BC

Vizakhapatnam to build iron ore facility

The Indian government has approved a \$149 million project to build an iron ore handling facility at the port of Vizakhapatnam. The project, which will be taken forward as a public private partnership, will be developed into distinct phases, with the investment capital provided by the concessionaire.

Initially, work will consist of upgrading the existing mechanised iron ore handling facility in the outer harbour, costing approximately two thirds of the total investment. This will bring capacity up to 16.2mt (million tonnes) per year. As part of the second phase, a new mechanized facility will be built at the West Quay-1 berth in the inner Harbour, adding a further 6.8mt of annual capacity.

Phase 1 is due for completion by June 2015 and Phase 2 within two years of the commencement of operations.

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Coal loading trials continue at Otway terminal

A second vessel, the *Alpha Action*, has called at the Chilean Otway Terminal to take on board a consignment of coal, as part of a series of trials. The 270m-long bulk carrier was loaded using both shiploaders, the first time the terminal has deployed both on a single vessel. Altogether, 140,000 tonnes of coal were placed on board.

The terminal is located on Riesco Island in Chile's XII region.

BC

Uruguay seeks alternatives to move record soy harvest

The soy harvest in Uruguay has been so good that it has surpassed the capacity of ports to export it. This, in turn, is leading to higher transport costs as a function of greater demand. Producers are angry that the port of Nueva Palmira has not yet been sufficiently developed to handle enough bulk carriers, however the National Ports Administration (ANP) is discussing various options to prevent a repeat of last year's congestion problems when a similar record harvest generated a large number of complaints from both producers and shipping companies given the inadequacy of the logistics capacity to cope.

According to analysts, the need for consignments to queue awaiting a vessel is causing prices to rise and therefore leading to Uruguayan soya being less competitive in world markets.

The ANP is looking at deploying barges along the river Uruguay to bypass crowded roads and therefore get consignments to the dock as fast as possible. Furthermore, these would be able to undertake direct vessel-to-vessel transfer. Although barge costs are somewhat higher than those for road transport, barges remain competitive in the face of road haulage congestion.

Large vessels are also handicapped when calling at ports in Uruguay. The failure to dredge the Martin Garcia Canal means that many Panamax bulk carriers can only load up to 75% capacity, resulting in consignments being limited to 45,000 tonnes out of a possible 65,000 tonnes.

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TPP handles first Capesize vessel

Terminales Portuarias del Pacifico (TPP) has successfully completed the loading of its first Capesize vessel at the Mexican port of Lazaro Cárdenas. In total, 140,000 tonnes of iron ore, which had come from mines in the state of Michoacán and Guerrero, was put on board the *Great Hebei* en route to China. The entire loading period took a record 133 hours, equivalent to an average 23,000 tonnes per day. BC

Peru to develop Salaverry for mineral exports

Peru's Ministry of Transport and Communications has reached an agreement with the National Port Authority and port workers to support investment by Impala Perú of more than \$130 million in the construction of a new mineral terminal at the port of Salaverry. The terminal will also prompt construction of a linking road, warehouses and a covered conveyor network, which will

bring in minerals directly to the stockpile area. Copper, silver, zinc, iron ore and coal from the mining areas of La Libertad, Cajamarca and Lambayeque will all use the terminal. Although the project has yet to be given the go-ahead by Proinversión, it's estimated that in the first year alone up to two million tonnes of minerals will be exported. BC

Port of Duisburg and Port of Antwerp strengthen co-operation

The Port of Duisburg and the Port of Antwerp will work more closely in the future, in order to intensify rail and barge transport between the two regions and their hinterland. Duisburg and Antwerp already signed a Memorandum of Understanding in 1999. On 4 July, they renewed this memorandum and extended it. The intensified co-operation will go well beyond the current plans to extend intermodal rail freight transport. It will strive for the qualitative reinforcement of the logistic corridor between the ports by reducing transit times in general and by providing the Port of Antwerp with improved connections to the railway system for which Duisburg is a central hub in the West. The direct rail connection from Duisburg to Antwerp was set up by the duisport Group in 2006 under difficult competitive conditions with regard to road and inland waterway transport.

"With this extension we are making the environmentally friendly and sustainable handling of future transport volumes between our ports possible," said Erich Staake, Chief Executive Officer of Duisburger Hafen AG on the signing of the memorandum. "From our perspective the direct rail connection between our ports is essential, even though we still have to make a detour as the most direct connection, the Iron Rhine, is not operational". Marc Van Peel, Chairman of the Port of Antwerp, added: "Together we intend to commit ourselves to intermodal rail freight transport in particular and to develop the Antwerp–Duisburg axis as one of the most important logistic corridors in Europe. In this respect, Antwerp will also actively cooperate on further developing the Vienna–Duisburg–Antwerp shuttle, Vienna being an important gate to the Central- and East European rail markets."

After the initial start of the Duisburg–Antwerp rail shuttle in 2006, the number of trains was constantly increased. Today, container trains with approximately 90 standard containers (TEU) per train run between Duisburg and Antwerp on a round trip basis ten times per week. To underline the strategic importance of a frequent and reliable connection

with Duisburg, the Port of Antwerp has now decided to actively participate in this rail link. As a confirmation of this partnership an agreement is being signed between the two parties. "It is actually a significant first step towards the concrete realization of the Memorandum of Understanding. The extension of a high-frequency rail connection between the hubs will allow for a vast improvement in the rail-relations between Duisburg and Belgian ports and will open up other significant European rail-markets," emphasized the two port-representatives Staake and Van Peel.

The trains will be processed on logport I in Duisburg. Loading and unloading is actually done in Antwerp via the Antwerp MainHub. The most important sea port terminals can be reached from there by train. The connections are operated by the duisport agency GmbH, a subsidiary of Duisburger Hafen AG, and IFB Inter Ferry Boats VA/SA from Belgium.

Next to the partnership in the Duisburg–Antwerp rail connection the port of Antwerp will also be working closely together with the duisport Group to strengthen the rail link with Vienna. The rail connection between Duisburg and Vienna was first set up by the duisport Group as early as 2003. As Austrian shippers prefer to be able to make a port choice, the port of Antwerp is helping to further develop this strategic freight connection. "Improving the Vienna connection over Duisburg allows the partners duisport and IFB to obtain economies of scale and increase the frequency of this rail connection", states Eddy Bruyninckx, CEO of the Antwerp Port Authority. He emphasizes that the Port of Antwerp is willing to analyse all the opportunities improving the port's hinterland connectivity.

The two partners are also considering mutual investments in the ports. Joint advice on possible investment projects will be exchanged in future as part of this cooperation. In the past, the Port of Duisburg had already taken a stake in the container terminal Antwerp Gateway on the left bank of the river Scheldt.



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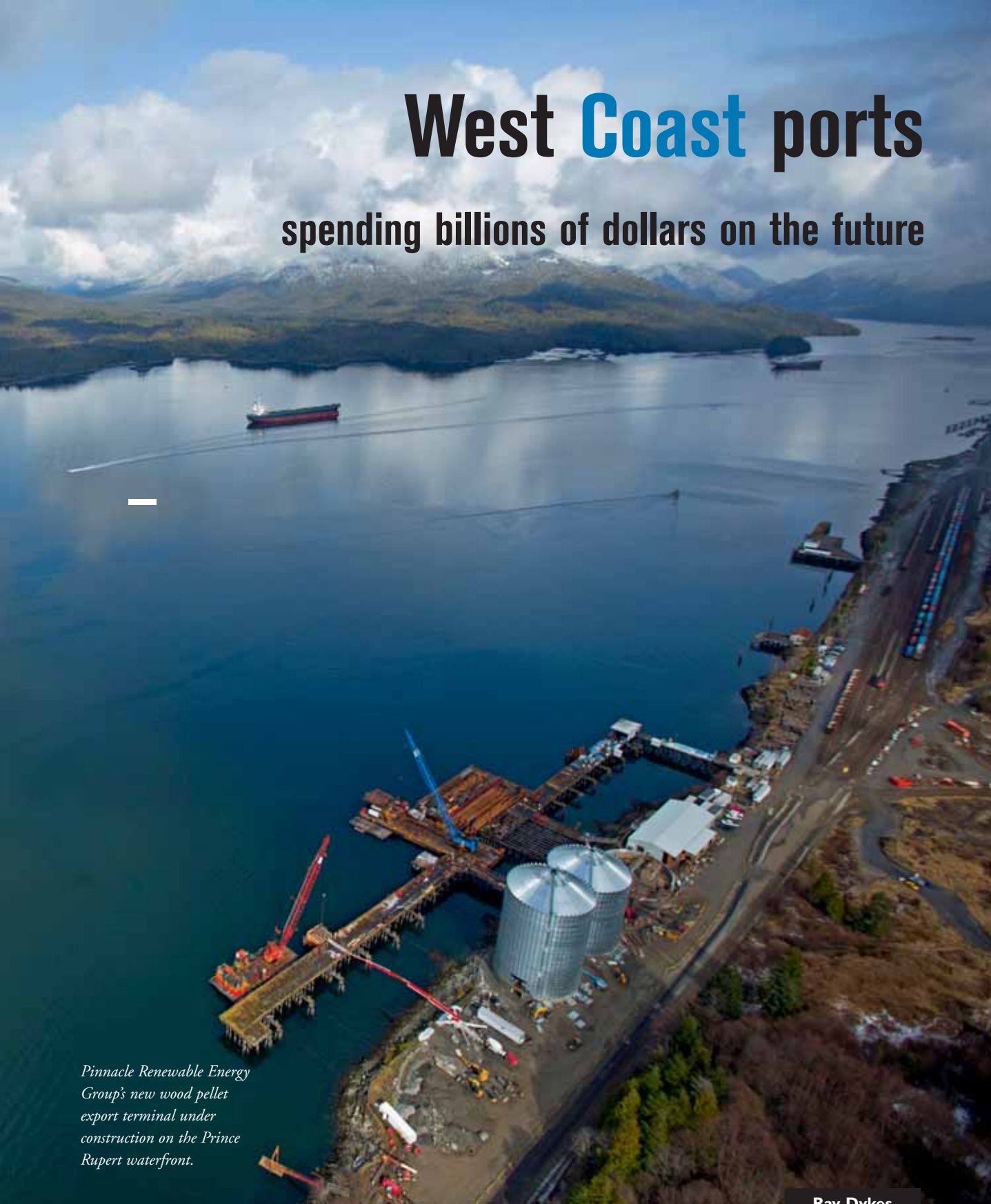
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West Coast ports

spending billions of dollars on the future



Pinnacle Renewable Energy Group's new wood pellet export terminal under construction on the Prince Rupert waterfront.

Ray Dykes

Ports up and down the North American West Coast are spending billions of dollars on infrastructure improvements readying for the future and its next generation vessels of sizes once thought impossible to handle.

With \$ billion plus budgets, the major ports in southern California, for example, are preparing for the challenge of an expanded Panama Canal and whatever threat to business that will bring.

At the Port of Los Angeles, a long-awaited milestone was reached with the completion of the decade long, \$370 million

Main Channel Deepening Project last April. The work by the US Army Corps of Engineers deepened the port's main channel and turning basins from 45 to 53 feet.

"This project has been our single-most important infrastructure project," said Port Executive Director, Geraldine Knatz, no doubt with an eye on statistics showing the container terminals that eagerly awaited the deeper channel to boost their competitiveness already bring in almost 75% of the port's business.

During the project, over 15 million cubic yards of dredge

materials was removed from the harbour bottom and spread throughout the port site, some of it being used to construct a 104-acre Cabrillo Shallow Water Habitat.

A year ago, Port of Los Angeles marketing manager, Marcel van Dijk said the port had “stepped up our game” and was pushing the advantages of LA over the canal route to eastern consumers. The nearby Port of Long Beach was also determined to fight to hold its market share, according to Director of Trade Development, Don Snyder.

This year, van Dijk says, “we are not there yet” amid flat growth figures from the Port of Los Angeles. He emphasizes that fuel costs are critical in global trade and predicts it will cost more dollars going through the Panama Canal to US East Coast ports than through Los Angeles with its fast and economical rail links to the Mid-West and beyond, particularly in the peak consumer season building up to Christmas.

“The verdict is not out yet on what is going to happen,” he adds, predicting that the expanded canal route will not see a bigger market share when it opens later this year or early in 2015.



Steel operations at the Port of Los Angeles.

A challenging world

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But, no world is without its challenges. The early December 2012 breach of the main causeway to our deep-sea Berth One dock by a Capesize vessel was one such challenge. Westshore quickly had the rebuild completed and the berth back fully operational. Now, a multi-year \$210 million equipment replacement project is planned to further enhance our efficiency and optimise operations.



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And then there's the intriguing talk of building a whole new canal route through Nicaragua. The West Coast marine industry is askance over news reports of an 11-year project to build a canal twice the length of that in Panama at over 100 miles long.

As the story goes, an agreement has been reached between the Nicaraguan Government and a Hong Kong-based infrastructure development firm for a 50-year concession that includes building a \$40 billion canal from the Pacific Ocean to the Caribbean Sea capable of handling the next generation super energy carriers, and container ships the size of Maersk's 18,000 TEU (20-foot equivalent unit) giant.

In Los Angeles, van Dijk says he's also heard of another plan in Colombia involving a new freight rail link from the Port of Cartagena on the East Coast to the Port of Buenaventura on the West negating the need for the Panama Canal and its expected higher fees. The offload in the East and reload onto ships on the West Coast bound for China and other Asian ports remains an idea only.

However, West Coast North American ports aren't sitting back and as one marketing executive said, “We will compete like crazy.”

In Canada, port and terminal upgrades seem to be the order of the day with billions of dollars of work set for the next decade led by Port Metro Vancouver in coal and petroleum handling infrastructure and equipment upgrades and the Port of Prince Rupert in coal and potential natural gas facilities that seem never ending.

Here's Dry Cargo International's annual



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Dry bulk key area of growth for Transmarine

Celebrating its 75th year, employee-owned Transmarine Navigation Corporation is a leading bulk cargo shipping agency in the United States. Headquartered in Long Beach, California, it has US offices on the US West Coast, the US Gulf and in Hawaii. Its dry bulk activity consists of its established market position, with grain exports from the Columbia River along with a rising volume of solid fuel, sulphur and other dry bulk commodities from US Gulf, California and Puget Sound ports.

Transmarine delivers value-creating agency service by employing a different model than its competitors: while some companies concentrate their expertise in the office and send entry-level personnel to vessels, Transmarine's boarding agents are trained veterans with an equity stake in the firm, placing experience and expertise aboard the vessel. These agents are backed by highly experienced operations managers and senior management.

The role of an agency divides into the routine and the exceptional. Routine agency tasks are not dramatic, but performing them poorly results in costly delays and blinding confusion for vessel owners and cargo interests; performing them with reliable consistency creates savings and clarity for the company's clients. However, it is in the exceptional issues when an agency's expertise and collective experience produce value for the client far beyond the cost of the service.

The agent needs to communicate constantly with the vessel operator and the cargo interests to report precise operational facts and also to illuminate possible complications to people in distant time zones who are perhaps unfamiliar with local practices. Empathy is essential. The agent has to communicate a situation and its nuances, provide advice with the aid of his experience and expertise, receive instruction, and act with promptness.

It is vital that an agency have a solid relationship with the people who work at the dry bulk terminals in the port, relationships that come from years of living and working in the same community, sharing similar concerns and interests. Agents also have to have a proper and courteous conduct when dealing with port authorities on behalf of principals. Operational knowledge, communications skills, clear and efficient accounting — these are all agency essentials. But

agency is a people business, where honesty and decency are the fundamentals.

Transmarine's clients form a roster of the world's most prestigious and recognizable companies in bulk shipping, commodities trading, grain houses, industrial conglomerates, oil companies (petcoke and sulphur), cement makers, and electricity generation utilities — from all continents.

Transmarine's coverage map includes every dry bulk port on the US West Coast along with the ports in Texas, Louisiana, the lower Mississippi River and Hawaii.

Transmarine is pre-eminent in the tanker market, but its dry bulk vessel volume is growing on all fronts: number of calls, amount of revenue and proportion of calls. Dry bulk is a key growth area for Transmarine. The company does not perform liner container work.

Competitors are well-known dry bulk agencies. All seem to have a regional concentration and try to expand their service offerings into other dry bulk regions of the country.

Transmarine's challenges relate to the competitive conditions of the ports and regions in which it operates, the environmental, labour and economic issues reported in the press. The poor condition of the dry bulk freight market makes cost control an ever higher priority and funds management a crucial factor in the survival of an agency. The agency that is highly disciplined with funding is performing a vital service for his principal and all other industry stakeholders.

Founded in 1938, Transmarine just became an ESOP (Employee Stock Ownership Plan) majority-owned company, as from 1 October 2012. The company believes it is the first shipping agency to achieve this. There are 75 employee/owners across offices in: California: Long Beach, San Francisco, Stockton, San Diego; Oregon: Portland; Washington: Seattle, Bellingham, Anacortes; Texas: Houston; Louisiana: New Orleans; and Hawaii: Honolulu.

Dry bulk contacts are: Peter Whittington, CEO; Jim Papp, President; Mark Hanson: VP Dry Cargo Marketing; Patrick Dunbar: Solid Fuels Marketing; Phil Brotherton: Breakbulk Marketing; Ivan Nikolic: California Dry Bulk Marketing; Scott Sullivan: Puget Sound Marketing; Tony Anderson: Columbia River Dry Cargo Marketing; Kyle Munson: Texas District Manager; and Paul Clancy: Louisiana District Manager.



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Corporate Headquarters
301 East Ocean Boulevard, Suite 590
Long Beach, CA 90802, USA
Telephone: (562) 432-6941
E: drycargo@transmarine.com
W: www.transmarine.com

review of how North America's major West Coast ports fared in 2012 and year to date (YTD) in 2013.

PORT OF LONG BEACH CA

One of the big spenders, the Port of Long Beach began a decade long, \$4.5 billion capital improvement programme in 2010. In the latest fiscal, which started July 1, 2013, the second busiest port in the United States has set aside \$788 million for capital spending to help boost its competitiveness by rebuilding and replacing outdated facilities and infrastructure.

Chief among these are the \$1.1 billion Gerald Desmond Bridge replacement now underway and with three more years of construction ahead, and the \$1.2 billion Middle Harbour container terminal modernization with combines two aging facilities into one in a multi-year project. The budget, which goes before the Long Beach City Council for approval in July, also includes \$73 million for environmental programs to improve air and water quality, as well as to protect wildlife.

As recovery continues to dominate thinking, total throughput in 2012 was up slightly at 59.1mt (million tonnes). Year-to-date figures through April had reached 21.1mt with container traffic leading the way at 2,073,394 TEUs and that was up over 17% on the same four months of 2012. Every container category was busier than a year earlier — loaded inbound was up 18.5% through April, loaded outbound up 11.8% and even empties were up 21.5%.

The port handles a wide range of cargoes, and the top imports in 2012 remained crude oil, electronics, plastics, furniture, and clothing while major exports included petroleum coke, bulk petroleum, chemicals, waste paper, and foods.

Container volumes were given a significant boost in 2012 when MSC and CMA CGM, the world's No.2 and 3 ranked container shipping lines, became financial partners at two of the port's container terminals. Long Beach also attracted the largest container ship ever to come to North America, with the call of the almost 14,000 TEU MSC *Beatrice*.

Possible new projects still in the environmental approval stage include a proposed new grain export facility at Pier T on Terminal Island. Currently making revisions after one public hearing, project principals Total Terminals International is expected to take its final Environmental Impact Report before the port board for approval by the end of the summer. The plan is to build a facility to transfer cattle feed grains known as 'dried distillers grains with solubles' from railcars to ocean shipping containers at up 2.5mt a year capacity.

On the green side, the Port of Long Beach is following mandated Californian regulations that require visiting container vessels to use shore power. Currently shore power hook ups are being built at all of the port's container terminals and by

2012 TOP WEST COAST PORTS

by total tonnes

Rank	Port	Million tonnes
1	Port Metro Vancouver	124.0
2	Long Beach	59.1
3	Los Angeles	56.0
4	Prince Rupert	22.2
5	Seattle	20.0
6	Tacoma	16.2
7	Portland	11.2

early next year more than half of all vessels will be able to plug in for their shore power needs while at berth.

The port launched a Green Ship Incentive Program in July 2012 to encourage vessel operators to bring their newest, cleanest-running ships to Long Beach. Since the programme began, the port has awarded over \$135,000 in incentive

The Port of Stockton celebrates its 80th anniversary by introducing its new all-water barge container service between Stockton and Oakland: "M-580 Marine Highway"



This new service demonstrates the port's ability to combine years of experience as a niche port with delivering additional advantages through innovative and expanding services for the San Joaquin Valley. The M-580 containers-on-barge service estimates three round trips per week, handling import and export traffic.

AS SIMPLE AS BOOKING TRUCKED CARGO

The process is the same. Steamship lines, NVOs, freight forwarders and customs brokers can quote your cargo costs inclusive of barge portion. Take advantage of this barge service for transporting overweight containers that can be loaded heavier than the 80,000-pound weight limit for trucks traveling between Stockton and Oakland on the highways. This could translate into a notable savings in ocean freight to the cargo owners. The port's direct transfer to/from rails, warehouses and open spaces further enhance cargo loading/discharging and staging alternatives.

The port is available to discuss this new all-water alternative to trucking. Please contact us.



Port of Stockton
CALIFORNIA

209.946.0246 portofstockton.com



payments to complying ship operators.

And the port says it has reduced diesel-related air emissions by 75% since 2005 when it began its Green Port Policy air quality improvement programmes.

PORT OF LOS ANGELES CA

The busiest container port in the USA, the Port of Los Angeles, is still licking its wounds after losing a major container service to rival Port of Long Beach. Worth about 500,000 TEUs a year, the Trans Pacific Service vacated Pier 400 at Los Angeles late in 2012 and the Maersk, CMA CGM, and MSC alliance took its business up the beach. The move hurt LA and total throughput dropped from 59.9mt in 2011 to 56mt in 2012.

And year to date through April the Port of Los Angeles was a shade over 15mt for a projected year end throughput that could drop below 50mt.

Containers are the port's main business and after a record 8.5 million TEUs in 2006 the total dropped to 6.7 million TEUs during the economic recession in 2009. Since then, LA climbed back to 8.1 million TEUs in 2012, but in the YTD through April, container movement had dipped 10.4% at 2,427,457 TEUs.

No wonder the port is about to go on a big spend with a \$1.1 billion budget in the 2013/14 fiscal year, including \$380 million in capital improvements to its container terminals. Major items include \$99 million for backland improvements at the TraPac Container Terminal to allow future automation and to bring on-dock rail to the facility — all of LA's container terminals will then have trains on the dock.

Another \$41.5 million is set aside for construction at the China Shipping Terminal, in work that includes 375 feet of expanded wharf and other backland improvements. Almost \$96 million will go to the installation of Alternative Maritime Power stations at major container terminals; another \$8.2 million is earmarked for the audit, design and construction for upgrades at liquid bulk oil handling facilities; and almost \$78 million will build a Berth 200 rail yard.

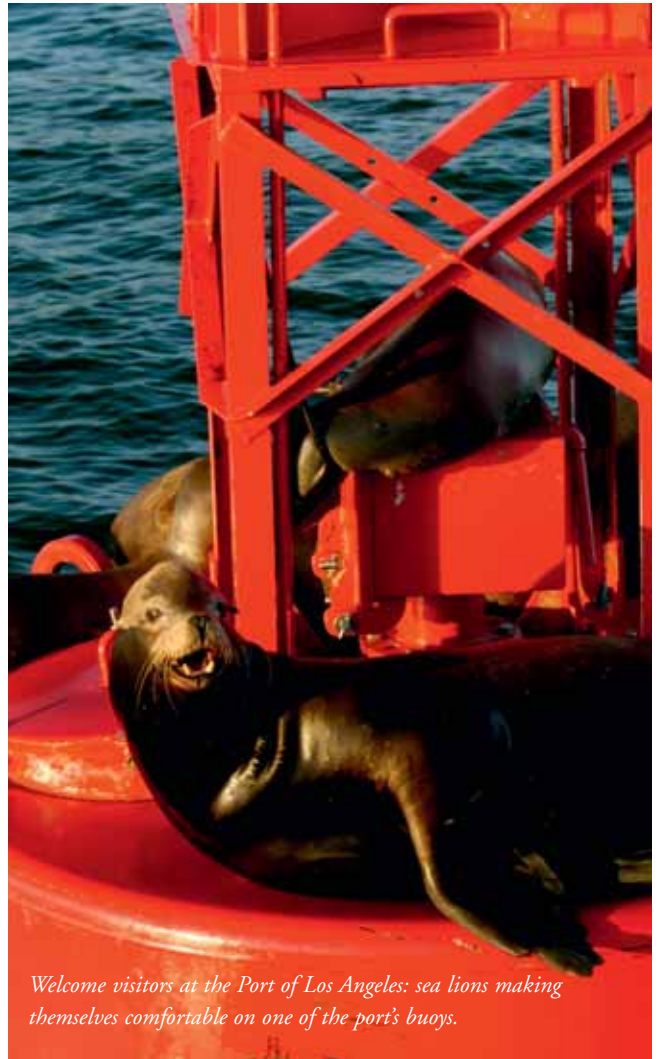
Other interesting work includes raising the height of eight container cranes by 26 feet at the China Shipping facility and seven others by 22 feet at TraPac to cater to 12,000 TEU vessels. Of the 85 cranes in the port's container terminals, nearly half are now Super Post-Panamax, the most modern available. And the port has also bought its first four ZPMC dual trolley cranes, which it expects to increase efficiency by 50%.

Yusen Terminals also has harbour commission approval to seek environmental approvals to deepen its berth depth from 45 to 53 feet and improve its facilities ready for next generation container vessels.

But, all isn't smooth sailing for the Port of Los Angeles where legal challenges have put a crimp in its green policies. In one US Supreme Court decision in June, the American Trucking Associations won a challenge against aspects of the port's Clean Truck Program — an imposed comprehensive licensing program on trucks hauling freight in and out of the port. In essence the court has ruled the port went too far in its stipulations that trucking companies were required to sign in order to qualify to haul cargo in and out of the port.

In another case, six trucking companies in two law suits have sued Los Angeles and the Port of Los Angeles Harbour Commission for abuse of powers in approving construction of a \$500 million Burlington Northern Santa-Fe 153-acre rail yard Southern California International Gateway Project near the port.

And not to be left out, the City of Long Beach is also seeking injunctions to prevent the rail yard project moving ahead,



Welcome visitors at the Port of Los Angeles: sea lions making themselves comfortable on one of the port's buoys.

asserting the project is detrimental to West Long Beach residents, adding that the project's impact on the health of nearby schools and homes 'is expected to be devastating'.

Not surprisingly, the Port of Los Angeles said it had "no comment" on matters before the courts.

PORT OF OAKLAND CA

With container traffic topping 2.3 million TEUs in 2012, the Port of Oakland had its best year ever, even if it was up only 0.1% on the total in 2011. In fact, Oakland has been edging up slowly after declines from 2007–2009. The container-only port bounced back in 2010 with a 13.9% lift to 2.3 million TEUs and in 2013 is up 1.3% through April.

As the fourth-busiest container port in the nation, Oakland has 10 terminals with 20 deep-sea berths and 35 container cranes, plus two intermodal rail facilities.

A major \$1.2 billion development of the Oakland Army Base is underway with substantial completion of rail access improvements and the Manifest Yard expected by June 2015, along with substantial completion of a Unit Train Support Yard. The total project has its own industrial development team led by Prologis, Inc. and the California Capital & Investment Group to create trade-related facilities focussed on enhancing and improving the port.

Meanwhile, Oakland is the first port on the West Coast to install a maritime visibility sensor. It has been located at the Ben E. Nutter Terminal used by the Evergreen Marine Corporation and will help seafarers safely navigate San Francisco Bay in foggy or low visibility conditions.

PORT OF PORTLAND OR

The major port of Oregon dropped overall tonnage by over 1mt in 2012 to 11,205,154 tonnes and that was down 8%, but still a far cry from the heftier totals above 11.8mt immediately before and after 2009 when shipments bottomed out at 9.3mt.

A union jurisdictional squabble over the handling of refrigerated containers — now settled by the courts — helped trim container movements to 183,203 TEUs in 2012 and that was a drop of 8% on the previous year. Mineral bulk, largely potash and soda ash dropped to 4.4mt was also down by 8% over 2011 totals. Grain has also been in a slow free fall and in 2012 topped 3.6mt, its lowest in almost a decade.

But, the Columbia River port is bouncing back with increasing auto volumes — Hyundai, Toyota and Honda imports and lately Ford exports to South Korea — at 284,138 units and the best totals in four years. Breakbulk was also up at 893,811 tonnes in 2012 but was languishing down almost 13% YTD through April 2013.

Infrastructure upgrades are expected to help in the recovery. The Kinder Morgan soda ash Terminal 4 facility is getting a new ship loader and conveyor section as part of a \$9.5 million upgrade which also includes removal of an outmoded structure and dredging this September alongside the dock to maintain at 40-foot operating depth. A pair of aged cranes will also be removed from nearby Terminal 6.

The port also recently announced plans by terminal operators to expand facilities at the Auto Warehousing Company facility at Terminal 6 (\$2.8 million in improvements) and the Columbia Grain facility at Terminal 5 (about \$40 million spending on new storage, cleaning, transporting and inventory management systems). A major \$11 million rail expansion at the port's largest industrial park, South Rivergate, was completed in June and is now fully operational improving efficiency and export capacity.

Meanwhile, the port is in the midst of annexing West Hayden Island, which will give it 300 acres for future marine terminal development. And it is also marketing available acreage at Terminals 2 and 4 for new liquid bulk, breakbulk and/or bulk customers.

PORT OF TACOMA WA

Responsible for almost \$50 billion in international and domestic trade, the port moved a total 16.2mt in 2012, including 1.7 million TEUs of cargo. Top exports were oil seeds and grains (\$2 billion), industrial machinery (\$1 billion), and cereals (\$636 million), while leading imports were industrial machinery (\$7.3 billion), vehicles and parts (\$6.4 billion) and electronics (\$5.7 billion).

It has been a year since Tacoma won the Grand Alliance from neighbouring Port of Seattle and a busy year it has been. The



Steel imports at the Port of Portland.

Grand Alliance — NYK, OOCL, Hapag-Lloyd and ZIM — has been the catalyst for impressive growth in Tacoma with year to date figures through May this year showing a 31% growth spurt at 758,071 TEUs. There was almost a balance of imports (up 45% at 281,145 TEUs) and exports (up 38% at 213,482 TEUs).

Without the boost from the Alliance, however, Tacoma's regular international volumes would be up a much more modest 3%. June numbers will probably be the last of the big gains for containers as July represents the anniversary benchmark month for the Alliance's move over from Seattle.

Auto imports (up 5.2% at 63,625 units), intermodal lifts (up 38% at 198,491), and log exports (up 53.7% at 207,500 tonnes) added to the good news through May. However, grain exports, which took a beating in 2012 dropping over 1mt because of a poor harvest for corn and soy beans in the Midwest and Great Plains, languished even further YTD at 1.2mt, down 49% over the same five months of 2012.

The port is adding a 100 gauge crane rail to its Pier 3 at Husky Terminal to accommodate larger cranes; is redesigning its Pier 4 to align better with Pier 3 and provide continuous berth space; and is preparing rail design improvements to serve future developments on the Blair-Hylebos Peninsula, the future site of Targa Sound Terminal's petroleum rail logistics facility. The port signed a lease in January with Targa for expansion of the former Kaiser Aluminum site and when operational by the end of the year the site will be the only petroleum handling facility actually on Port of Tacoma property although Targa and U.S. Oil have plants in the port area but on their own land.

On the environmental side, the Port of Tacoma has completed the Dick Gilmur Shoreline Restoration and Kayak Launch, and the Place of Circling Waters (a former gravel pit) habitat sites with public access. The port is also busy designing a 40 acre wetland habitat with stream and pond features by reconnecting more than a mile of Clear Creek to its former flood plain and wetlands.

Tacoma, Seattle and Port Metro Vancouver over the border in Canada have also joined together in a Northwest Ports Clean Air Strategy designed to reduce diesel emissions by 75% per ton of cargo by 2015 and 80% by 2020. Combined with projected cargo growth in the three ports, this will result in overall reductions of 70% by 2015 and 75% by 2020.

PORT OF SEATTLE WA

Seattle continues to be Washington State's busiest container terminal with total throughput for all cargoes of 20,046,323 tonnes in 2012. But, that figure was the lowest in the past three years and over 2.8mt down on its 2011 performance.

TEUs at 1,885,680 in 2012 were the lowest since 2009. Poor crops pushed grain exports to their worst total in a decade at 3,161,013 tonnes and petroleum settled at 620,587 tonnes, another dismal performance looking back over the past decade. Only molasses showed some spark at 74,831 tonnes and that was the best level of the decade.

The loss of the Grand Alliance container service to rival Port of Tacoma hasn't helped the statistics and the recent news that Moody's Investor Service had downgraded the port for its poor fiscal position, which it said was likely to get worse, was seen as yet another challenge.

"The global competition for our port-related jobs in Puget Sound is real," said Port Commissioner Bill Bryant late in June. "This is validation of that. It's not serious unless we ignore it. It's a wakeup call."

But, don't write off the Port of Seattle just yet. It has welcomed the United Arab Shipping Company (UASC) to its harbour since May joining with China Shipping Container Lines (CSCL) and bringing two 4,250 TEU ships to the service. CSCL will also upgrade their Asia Pacific vessels to that size bringing six in total to the port.

Last year, SSA Terminals added three more Super Post Panamax cranes to its fleet at Terminal 18 allowing it to handle the largest container vessels in the world. And Total Terminals International and Hanjin Shipping Co. recently signed a ten-year lease extension for Terminal 46, another of three facilities in the port that is 'big ship ready' with 50 foot channel depth to the

berths and Super Post Panamax cranes ready to handle the boxes.

The port is a major financial contributor in a project that removes an elevated highway along its waterfront and the world's largest tunnel boring machine *Bertha* will begin construction of the Alaskan Way Viaduct in its place this summer.

The Port of Seattle is a member of Green Marine, the largest voluntary environmental program for the maritime industry in North America, and was the first outside the Great Lakes ports to do so. The programme addresses nine key environmental issues such as noise, dust and light. Seattle is also in the Northwest Ports Clean Air Strategy with Tacoma and Port Metro Vancouver.

PORT METRO VANCOUVER BC

At 124mt in 2012, Port Metro Vancouver in British Columbia continued to be Canada's largest and most diversified port as well as being No. 1 in overall cargo volume on the West Coast of North America. And the pace is moving along in 2013 with YTD figures through March showing a 9% boost over the same three months of 2012 as the port gets back to pre-recession volumes.

Record container movements in 2012 topped 2.7 million TEUs and that was up 8% over the pace of 2011. Dry and liquid bulk shipments — largely coal, grain, potash and petroleum — reached a record 83.8mt. Breakbulk shipments jumped 4% to 16.7mt led by a 14% boost in raw log shipments at 8.4mt, while wood pulp climbed 3% to 1.4mt. Not to be outdone, automobile volumes were up 29% to 384,000 units in 2012. And cruise passenger numbers were up slightly at 820,000 with 60 cruise ships using shore power last year.

Port Metro Vancouver is the most diversified port in North



*Aerial view of the
Port of Seattle.*



Port Metro Vancouver BC has approved a capacity increase of Neptune Bulk Terminals to lift its coal handling by 6mt to 18.5mt a year.

America in terms of cargo sectors, trading partners and import-export balance. But, being No. 1 comes at a price. Environmentalists and other activists have been giving the port a hard time in recent months over plans to double the capacity of a Kinder Morgan oil pipeline through the Inner Harbour of Vancouver.

And there's been mounting opposition to anything coal with public angst over a recent proposal to barge coal down the Fraser River to Texada Island in the Strait of Georgia for transshipment onto ocean going vessels heading for Asia. The proponent, Fraser Surrey Docks, wants the business as its TEU count has dropped away of late as ships get too big for the up-river facility.

The port has approved a capacity increase of Neptune Bulk Terminals to lift its coal handling by 6mt to 18.5mt a year. There seems to be some fear that Vancouver might even become the major coal export port in all of North America — protestors have been warning cruise ship passengers of this possibility recently unaware that it's a title the port has already held for years.

Westshore Terminals, the busiest coal export facility in all of North America, and situated at Roberts Bank in the port's outer harbour, recently completed an \$110 million equipment upgrade project that took its capacity from 23.5 to 33mt a year. A further multi-year \$225 million investment in new equipment and replacing aging stacker-reclaimers and a shiploader has been announced for phased startup in 2014 and that will enhance efficiency even further.

The port has been more public and in the news than for many years. "Over the long term, we believe that our success and competitiveness will depend on our willingness to listen, to be open to new ideas and new approaches, and to work together to create a common vision," says Robin Silvester, Port Metro Vancouver CEO and President. The port shares its space with about 16 different municipalities and is constantly seeking ways to engage with them while improving the port and the region's long-term sustainability.

With over \$4 billion in port improvements and transport infrastructure upgrades under way or planned, Port Metro is involved on multiple fronts from road upgrades to rail

overpasses, while tenant terminal operators have a myriad of infrastructure and equipment projects stretching well into the future.

In a busy green calendar, Port Metro Vancouver is part of the Northwest Ports Clean Air Strategy with Seattle and Tacoma.

PORT OF PRINCE RUPERT BC

Prince Rupert moved a record 22.2mt of cargo in 2012 — a 15% increase over 2011 — and up seems to be the only place to go for the statistics. Overall profitability has also improved and President & CEO, Don Krusel, says "our zeal for competitiveness is undiminished," as the port is committed to becoming Canada's trade solution as it switches its focus on Asia-Pacific economies.

Excitement and growth dominate the Port of Prince Rupert these days as it braces for a burst of liquefied natural gas projects totalling over \$20 billion in investment if all go ahead. Two projects — Prince Rupert LNG and Pacific Northwest LNG — have a potential annual capacity of more than 30mt combined. The cause is being championed by the B.C. Provincial Government as a jobs catalyst and the future saviour of the provincial coffers.

The sole container mover, Fairview Terminal topped 500,000 TEUs for the first time in 2012 and retains its title as the fastest growing container terminal in North America. At 564,856 TEUs, Fairview increased 37% over its 2011 performance.

Bulk shipments through Ridley Terminals also had a good year in 2012 with steelmaking coal up 10% at 6.9mt and energy coal up 27% at 3.2mt.

Petroleum coke soared 75% to 1.4mt. In grains, wheat dipped 5% to 3.4mt and barley dropped 38% to 306,478 tonnes, while canola jumped 21% to just over 1mt. Raw logs dropped 36% to 324,270 tonnes despite the continuing recovery of the British Columbia forestry industry.

Cruise passenger numbers have been in decline since 2008 with the contraction of the Alaskan cruise market, but now even that appears to be on the rebound, says the port.

Work is underway on the \$90 million Ridley Island road and rail utility corridor which could see a potash export facility built and other marine uses, adding to the overall excitement about growth in the port.



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Pasha Stevedoring & Terminals writes new chapters in bulk handling



PACIFIC NORTHWEST

The Port of Grays Harbor, on the US Pacific Northwest coast, is a small port with a long history. Together with Grays Harbor personnel, AG Processing, Inc. and the local ILWU labour force, Pasha Stevedoring & Terminals (PST), a California-based operation, has helped the port recapture its past glory. In its heyday during the early part of the 19th century the port handled mostly forest products: longs, lumber, pulp and paper. Although forest products remain a part of the bulk cargo mix, dry agricultural products are now one of the leading exports. More than one-third of the soybean meal exported by the United States leaves from Grays Harbor, destined for ports in the Philippines, Malaysia, China and Australia.

NO TWO VESSELS ARE THE SAME

Vessel size and type of commodity influence loading techniques. When loading soybeans and corn, it is important that the product is relatively flat inside the hatch or it could shift during the voyage. In some cases two types of products are loaded into a single hatch. This requires a technique known as a Kobe

separation. The first product is poured into the hatch. A bulldozer is then lowered into the hatch to level the product. After removing the bulldozer tarps are placed over the product followed by plywood. The second product is then poured into the hatch. An interesting process to watch!





INCREASED EXPORT DEMANDS

Increased export demands led to the construction of a new storage export facility, which opened in April of 2012. AGP exported more than 1.2mt (million metric tonnes) of dry agricultural products last year, and over 700,000 metric tonnes of dry agricultural products have been exported through June of 2013. Vessel calls have averaged around 25–30 per year and an increase is expected this year as a result of the facility completion.

SOUTHERN CALIFORNIA

Partnering with Sims Adams Recycling in Los Angeles/Long Beach Harbors

Iron ore is a raw material that doesn't require any chemical processing and it's one of the cleanest bulk products around. It is the most essential ingredient in the production of steel. SA Recycling (SAR) is a joint venture between California scrap processor Adams Steel and the global leader in metals recycling, Sims Metal Management. In March 2013, the company exported its first 50,000-tonne shipment of iron ore, the first of its kind in the Port of Long Beach in over 40 years. Since then, SAR has exported an average of 53,000 tonnes of ore on each of seven vessels. PST, as stevedore, handles all the loading aspects of this cargo. PST's crane operators have been trained to drive the client's 80-tonne capacity Gottwald crane. Other equipment used by PST is a Caterpillar D-8 Dozer, which is needed throughout the operation to spread out the cargo in the holds (perhaps the most difficult part of

loading scrap steel, as it operated mostly by feel). On the vessel side PST averages 9,500 tonnes per shift when loading and can load a 55,000dwt vessel in three days.

BOOSTING THE ECONOMY

The iron ore is currently sourced by CML Metals from the mines in California and Utah. However, SAR plans to receive ore from Nevada as well. The iron ore is once again a viable commodity to export due to the continuous need by the Asian steel industries and the current market value. Many of the Southwestern mines previously closed have once again become viable businesses. SA Recycling expects to export over 1mt in 2013 and up to 2mt in 2014. Projections are even higher for 2015. Iron ore is a natural fit for SAR's facility in Long Beach and also allows the port to expand its core business with its leading trade partners. Nationwide, exports are on the rise which helps grow trade and increase jobs which strengthens the US economy.

DCi



Interval impactors move difficult bulk materials



PKL 150 on chute: by preventing build-up and blockages, the impactors contribute to greater process efficiency, helping to reduce maintenance and downtime.

The new PKL® Series Interval Impactors from Martin® Vibration Systems are designed to deliver the force needed to dislodge sticky materials from process vessels, chutes, pipes and storage bins. The very high acceleration generates individual blows similar to a hammer, while reducing noise, energy costs and the potential for bin damage or personal injury. Based on individual application requirements, the company can supply interval impactors providing from 120-1700 pounds of force to move material that resists the effects of rotary vibration.

“The PKL Series is very effective at moving sticky materials from a wide range of storage vessels,” commented Mike Lindbeck from MVS. “It also works well clearing dusty residues and breaking up accumulation, helping bulk material handlers avoid bridging and ‘ratholing’ that can strangle flow rates,” he said.

With variable impact frequency from 10 to 60 per minute, the PKL 2100 can be tuned to suit specific material characteristics and operating environments, minimizing noise, energy costs and equipment damage without the need for an external timer. The low operating frequency combined with the ‘air-against-spring’ design translates to very low energy usage, yet the new impactors deliver 30% more force than preceding designs.

The PKL Series Impactors can operate from supplied air pressure of 45-115 PSI, with a 5-micron filter, pressure regulator and lubricator. They are designed for a maximum operating temperature of 250°F (121°C), with high-temperature models capable of handling up to 320°F (160°C).

Options include stainless steel construction, ATEX certification and portable Vac-Mount™ units. Available in six different body sizes, the PKL Series is well suited for use on transfer pipes, cyclones, chutes, silos and hoppers. By effectively preventing build-up and blockages, the units contribute to greater process efficiency, while helping to reduce maintenance and downtime. All PKL Series Impactors are covered by a full three-year warranty when operated within recommended limits.

Martin Vibration Systems Solutions is an innovator and supplier of feeders, weigh systems and material handling products for a wide range of industries, including chemicals, food, pharmaceuticals and foundries. It supplies electric, hydraulic and pneumatic vibrators, vibratory feeders, hoppers, compaction tables and other components. MVS has built its reputation on developing quiet and efficient designs available. They are engineered and built to deliver precise energy transmission, long service life and low maintenance.



*PKL 2100 003:
The PKL Series
Interval
Impactors help
dislodge sticky
materials from
storage vessels.*

Green timber handling: four SENNEBOGEN 735 M-HDs work at Pfeifer Holz



Two of the SENNEBOGEN 735 M-HDs work at the Lauterbach location and help the Pfeifer Holz team to rationalize the logistics processes.

In an idyllic rural setting, at the Lauterbach location, Pfeifer Holz produces not only sawn timber of fir and pine, pressboard blocks, and wood pellets, it also operates an environmentally-friendly biomass combined heat and power plant directly on the plant facilities. With a fleet of four SENNEBOGEN type 735 M-HD timber handling machines, now also in two-shift operation in Lauterbach, up to 10m³ of round timber is moved per cycle.

The Lauterbach location, founded in 2009, belongs to the Pfeifer Group, which was founded by Barbara Pfeifer in 1948 in Imst/Austria. The firm started with a small saw, from this beginning the company developed into a group with 1,500 employees and eight locations in three countries. Pfeifer Holz guarantees quality products, continuity, and security of supply for customers, now in more than 75 countries.

TRADITION AND INNOVATION

On of the most tradition-rich and competitive enterprises in the European timber industry, Pfeifer Holz pursues the philosophy of innovation, but also the reliability and stability of a family-owned company with clear structures. These structures have also motivated the Lauterbach location to decide for an innovative and reliable product that can withstand the harsh day-to-day production. Thus, once again, here the choice was made for the 'Green Line' from SENNEBOGEN, the Bavarian specialist for materials handling devices and wood moving machines. The company had already had good experience with the SENNEBOGEN machines in the Kundl and Unterbernbach plants.

OPTIMIZATION OF WORK PROCESSES THANKS TO TRAILER SOLUTION

Herbert Stöckl, responsible

for the logistics and the purchasing of large machines, explains the idea behind the SENNEBOGEN timber logistics machines: "Each machine is equipped with a large trailer for round timber. Because we not only speak about innovation, but implement it in action, we decided for the trailer operation. This functions very effectively, with this equipment we save up to three additional trips. Instead of just one load in the grapple, now the machine handles three additional loads on the trailer and the machine only drives once for a total of four loads. The diesel savings are incredible and the work procedures can be designed significantly quieter due to shorter work paths."

SCHLÜTER BAUMASCHINEN ADVISES CUSTOMERS AND ENSURES OPTIMAL SERVICE

For the SENNEBOGEN machines, the key factors were not only the easy handling of the implements, but also the proximity to the responsible dealer, Schlüter Baumaschinen. With a broad service network and 22 plants in all of Germany, the family-owned company, which is headquartered in Erwitte, offers safety and service around the clock. The company, Bordt Baufahrzeuge in Stuttgart now has also been part of the Schlüter Group for one year. Trained service employees make every effort so that all

customers can work even more effectively, more efficiently, and thus more cost-effectively.

For example, to more effectively establish the new acquisition, all operators at Pfeifer were trained by the specialists from Schlüter Baumaschinen and Bordt Baufahrzeuge and instructed on the devices. Tricks and tips help personnel become more familiar with the device and to work more effectively.



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Cat® C Series knuckleboom loaders: fuel-efficiency and more lift

The new Cat® C Series knuckleboom loaders from Caterpillar Forest Products feature fuel-efficient power systems, upgraded hydraulics and significantly more lift at full reach than previous models.

The line includes the Cat 579C loader, best for big wood, clear cutting and severe delimiting applications, and the Cat 559C loader, ideal for working in pine, pulpwood and thinning.

“Like previous models, the new C Series models are fast and smooth with superior multifunction capability. In addition to that, the C Series is more efficient and productive,” said Blake Vaughn, Caterpillar Forest Products product performance engineer. “For example, in controlled lab tests the 559C was 22% more productive than the 559B burning the same amount of fuel.”

The larger loader also now has a right-side operator’s cab with a walk-up platform and enlarged doorway for safe access to the cab.

The C Series is powered by the 129.5kW (174hp) Cat C6.6 ACERT™ engine. In designing the engine to meet US Tier 4 Interim



emissions regulations, new technology was incorporated to ensure that changes would not reduce the life of the system, increase operating costs or reduce productive uptime. The automatic engine idle down feature and the variable speed engine fan that cools only as required, further reduce fuel consumption.

The 579C loader lifts 35% more at full reach, and the 559C lifts 25% more at full reach, compared to the previous models. “The boost in lift capacity is right where the operator can use it most — at full reach,” Vaughn said. “The lift capacity in the previous models was already strong throughout the rest of the range of motion, so with the increase in lift at full reach, it gives operators that much more capability.”

Three operating modes give loggers the flexibility to match hydraulic power to the job requirements, from thinning small pine to clear cutting big hardwoods. For normal loading operations, the Economy Mode provides fast cycle times and the most fuel economy. The Run Mode allows more hydraulic power for more demanding jobs and the Power Mode provides the most muscle for heavy duty delimiting, slashing and loading applications.

The C Series has an excavator-style Negicon piston pump hydraulic system, a robust, reliable system with a simple valve design and big spools to allow fluid to pass through easily. The increase in hydraulic line size also accelerates grapple opening and closing. “This hydraulic system is field proven. It’s been a reliable platform for Caterpillar in other knuckleboom loader models, other forestry machines and excavators,” Vaughn said. “This means more uptime, longer life and better performance.”



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Coperion supplies alumina feeding technology to Dubai Aluminium

Coperion GmbH, Weingarten/Germany, has successfully supplied and commissioned its automatically operating DURODENSE® pot feeding technology to Dubai Aluminium (DUBAL), United Arab Emirates. The system, to be used at the pot line I smelter at DUBAL, supplies primary and secondary alumina to 64 cells of the DUBAL D18 and D18+ reduction cell technology. It replaces the regular crane feeding operation, increasing its availability for other operations, saving labour and avoiding dust emissions to the environment. With this, Coperion strengthens DUBAL's undertaking to retrofit its older potlines to optimize energy consumption with higher efficiency and reduced Perfluorcarbonyl emissions being environmentally level with other advanced technologies. With this project, Coperion — a renowned specialist in the supply of bulk materials handling systems to the aluminium producing industry — has proven once again to be a competent partner for a technologically driven modernization project in the aluminium industry.

With DURODENSE®, Coperion offers a sustainable solution to supply aluminium oxide to the reduction process in aluminium smelters. It meets the requirements of new greenfield smelter projects and it has proved to be versatile and adaptable to the demanding requirements of brownfield smelter modernization projects. DURODENSE® is built with a modular system body, using round-shaped standard piping with internal product fluidization for the most gentle product transport. Due to such a slim design, the routing of the system is very flexible and as a consequence the installation at and the penetration through an existing pot room wall structure is facilitated. This is also advantageous, especially at the pot superstructure compared to other systems that require more space. With the utilization of standard couplings, the use of standard piping minimizes problems with sealing and thermal expansion.

The DURODENSE® system has its very high operating reliability due to the following:

- ❖ The main distribution pipe along the pot room is constantly filled to almost 100% with alumina. The whole system serves as an alumina buffer located close to the cells. Due to this, very high instantaneous filling rates into a cell hopper are possible. Even cell technologies with a strong fluctuating filling level in the cell hopper can be filled immediately;
- ❖ The system is equipped with a special air distribution system inside its fluidization elements. These devices ensure that in case of plug formation the air can't bypass the plug but is forced into the alumina plug and dissolves it. This is a clear advantage compared with other systems;
- ❖ The air consumption for the total system from silo to pot during normal operation is less than 0.6 to 0.7m³/min per pot



and very constant. This leads to a very low material velocity in the piping and avoids the risk of scaling. The low and constant air consumption causes a low impact on the gas balance of the pot room, a low impact on the gas treatment center (GTC) gas balance and a low impact on the roof emissions as well. This is a very important benefit especially for revamping projects with existing GTCs and related gas balances; and

- ❖ The system does not need any sensor or actor (gates, valves) at the pots. The system is completely self-regulating. This eliminates the investment cost for sensors, actors and related cabling and control boxes compared to other existing automatic systems.

All these features of the DURODENSE® pot feeding system provide clear benefits for new smelter projects as well as for modernization projects.

After the successful realization of the alumina and petcoke handling and storage facilities in the port of Qatalum and the bulk handling facilities in the courtyard areas of the Ma'aden smelter, Coperion now completes the material handling chain with the successful operation of the DURODENSE® pot feeding system in the DUBAL smelter.

SENNEBOGEN 830 M-T: ideal for logging camp duties



With only three people living per square kilometre, it's usually quiet in the large boreal forests of Saguenay-Lac-Saint-Jean, Canada. But there is a lot going on where the new SENNEBOGEN 830 M-T does its duty. Luc Gauthier, of Services Forestiers R.G.T. had a lot at stake when he was deciding on a new log-handler — about 1,500 metric tonnes per day, in fact.

This SENNEBOGEN 830 M-T, working at Services Forestiers R.G.T. for the Remabec Group, was designed specifically for logging work. Every SENNEBOGEN material handler is purpose-built for its application, but the 830 M-T introduces unique features found only on this one model. Engineered for both fast loading cycles and heavy trailer pulling, the 830 M-T is equipped with a specially reinforced undercarriage and with dual transfer cases delivering dedicated drive power to each axle.

HIGHEST RELIABILITY AND NEARBY SERVICE AND SUPPORT

Operating in a remote boreal forest area seven hours north of Quebec City, Gauthier was careful to look into SENNEBOGEN's service support as well as the capabilities of the equipment. He was pleased to find that SENNEBOGEN's Quebec distributor, Hydromec Inc., maintains a branch in the nearby town of Dolbeau. The new machine has been working there since the beginning of 2013, and co-operation is good, praises Gauthier.

From June to early spring each year, Services Forestiers R.G.T. runs its loading operations about 100 hours per week. Serviceability was a key factor when the camp's

management team was comparing machines.

"We've found that the components are well placed and it's easy to access them," Gauthier reports. "For me, the biggest point was the fact that there are no electronic components on the machine. SENNEBOGEN uses hydraulics that I think any mechanic would be able to handle. We know how to work on this machine to keep it running and considering where we are located, this is critical."

On the job, the 830 M-T has been proving that it can carry its weight in a demanding camp application. The results have been good: the fuel economy, its stability on the rubber tyres. It will do 2,500 to 3,000 hours per year, running on 12-hour shifts. Its lifting ability is excellent; you don't feel the weight of the wood. The capacity is good and the pulling power is very strong. I see lots of opportunity for it in trailer-pulling service. All of that went into our decision to buy the 830 M-T. And so far, if we needed another machine, it would be 'yes' to another SENNEBOGEN."



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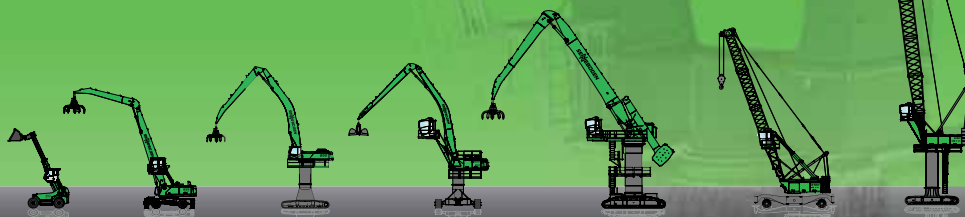
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SCHADE announces new patent for circular storage with two scraper booms

SCHADE Lagertechnik GmbH, one of the world's leading manufacturers of equipment for bulk material stockyards and blending beds, and part of the AUMUND Group of companies, has developed the patent for a technical solution the realization of which will cause a sensation in above all the bio-fuels and coal sector. Through employment of two booms the intake and reclaim capacity can be doubled without any difficulty according to SCHADE engineers. Circular storages, which offer the simple option of a covered area and — compared with longitudinal storages — result in a 50% smaller footprint whilst offering comparable storage capacity, can be realized by SCHADE with diameters of up to 150 metres.

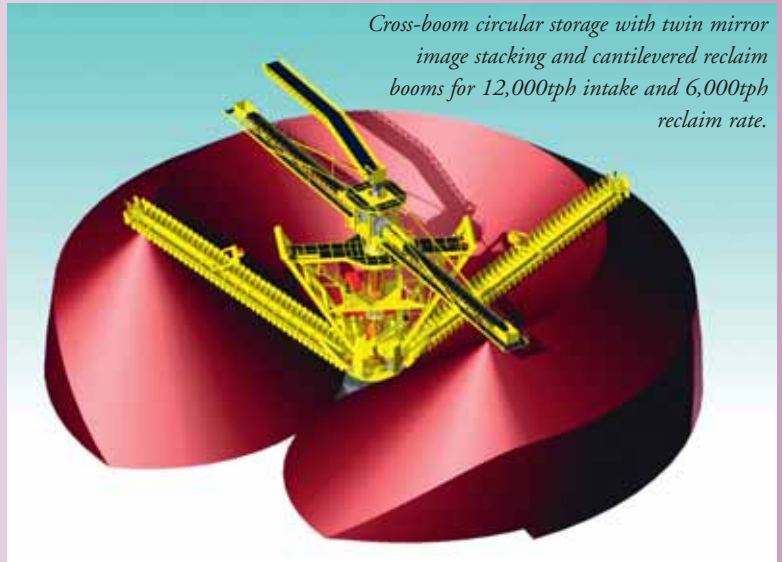
Subject of the patent is a circular store which, in contrast to the solutions employed hitherto, features not just one, but two raisable and lowerable scraper booms on the central column. These scraper booms are positioned symmetrically to the central column in the storage area and are interlinked in such a manner that they serve as a mutual counterbalance and thus the traditional counterbalance can be dispensed with. The stacker boom can be stored in the conventional design mode on the central column, centrally and slewable or, in the form of a symmetrical design, cast off the material to the opposite sides. Also in this latter case, as with the scraper booms, a counterbalance is not required.

With the invention comes the advantage that, on simultaneous employment of both booms, an almost double intake or reclaim capacity is achieved compared with conventional circular storages.

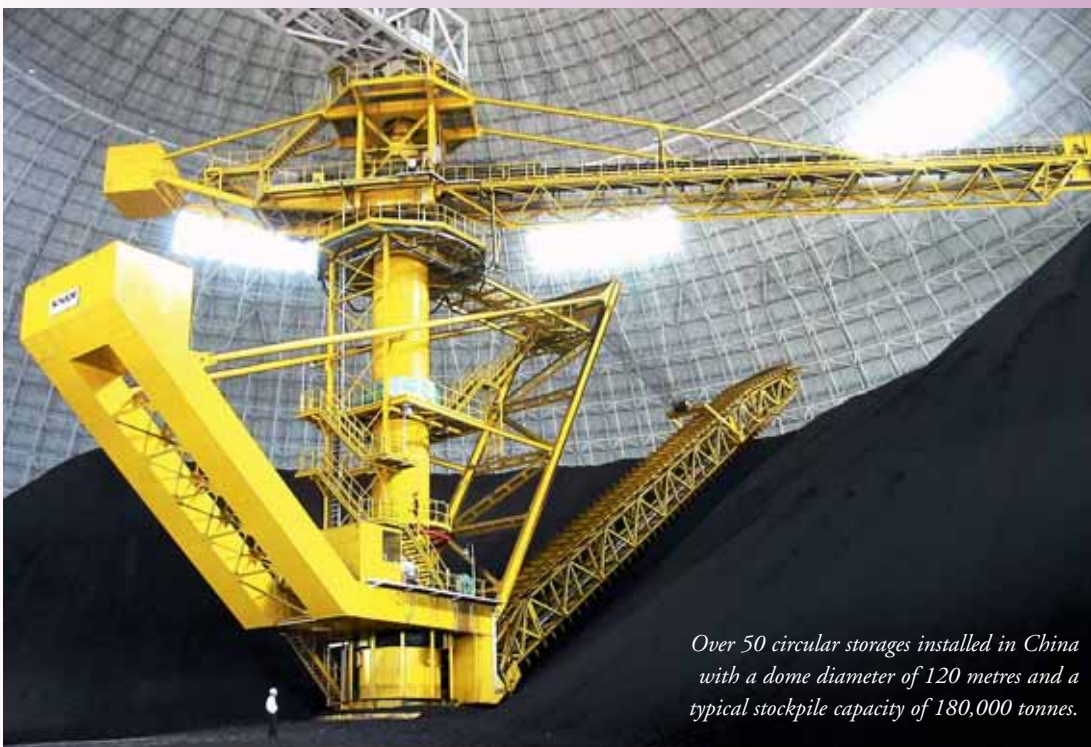
"Reclaim capacities of 5,000tph [tonnes per hour] to 6,000tph are no problem with this device under suitable conditions," reports SCHADE managing director Karl-Heinz Fiegenbaum. Particularly in the case of high performance and high capacities the new machine could present an alternative to solutions employed thus far, especially in the fields of bio-fuels, mining, power and ports and terminals.

Thanks to the high capacities achievable during simultaneous filling and discharging, the system can be employed for not just pure storage but also for transshipment as an interim buffer, thus enabling short residence times for loading and unloading of ships and railway wagons. The system accommodates ever higher demands according to availability and functions via employment of the two booms on a redundancy basis, i.e. if an operational stoppage occurs in one of the booms the unit opposite continues working. Similarly, the total weight of the machine is reduced as a result of the counterbalance being replaced by the additional stacker or scraper boom — as are foundation expenditure and space requirement for each tonne of bulk material moved. Depending on the dimensions of the circular storage, on complete filling, 50,000m³ (starting at a diameter of 90m) up to 450,000m³ material (at diameters of 150m) can be stored.

With the realization of the market-ready patent solution which is now being offered proactively in the marketplace, SCHADE once

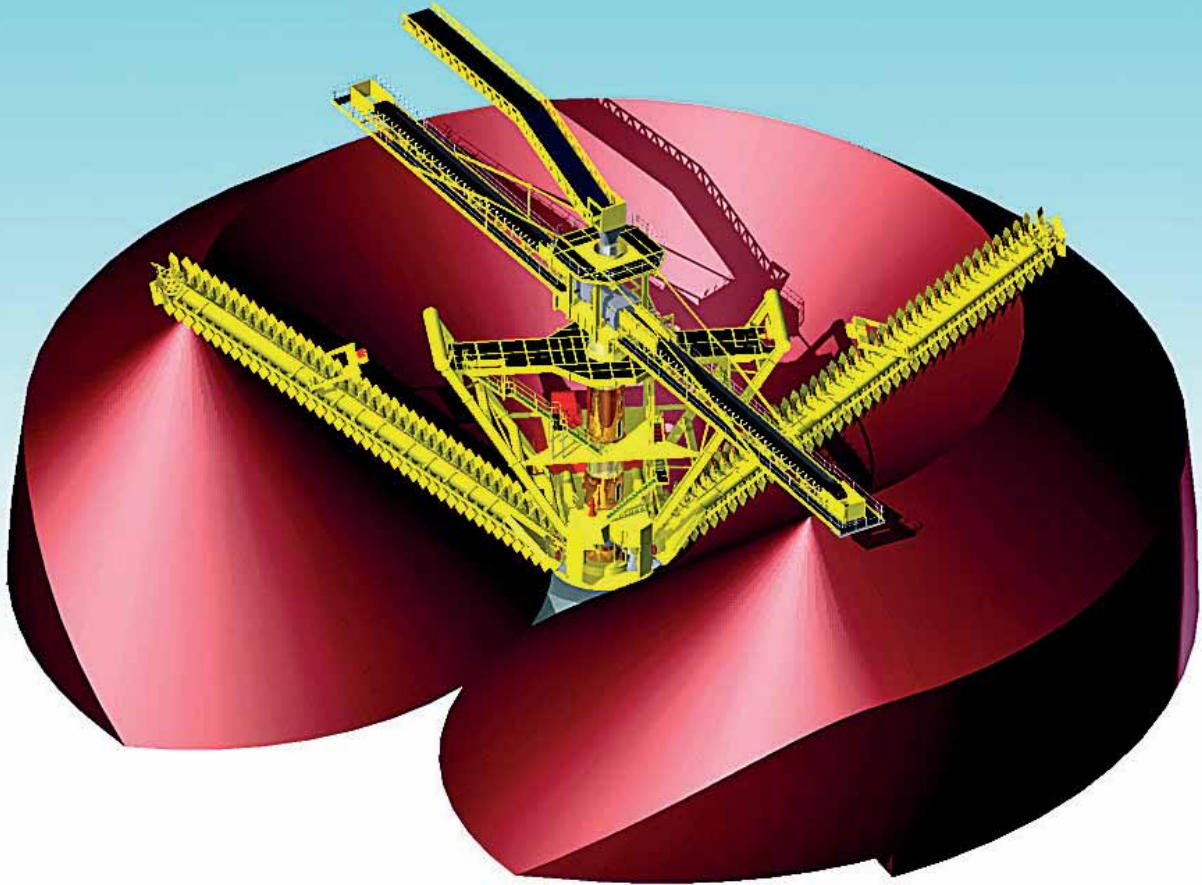


Cross-boom circular storage with twin mirror image stacking and cantilevered reclaim booms for 12,000tph intake and 6,000tph reclaim rate.



Over 50 circular storages installed in China with a dome diameter of 120 metres and a typical stockpile capacity of 180,000 tonnes.

again demonstrates its flair for innovative solutions: already in 1959 the company presented the world's first scraper reclaimer with double boom, eight years later SCHADE installed the first scraper reclaimer for a coal-fired power station. Amongst the more than 600 references worldwide, nine of the world's largest circular storages are to be found (Mai Liao, Taiwan) and one of the world's largest portal scrapers for coal (Dawson, Australia).



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“The E-Crane system has cut our unloading time in half, cut our maintenance time dramatically, simplified operation and reduced our costs.”

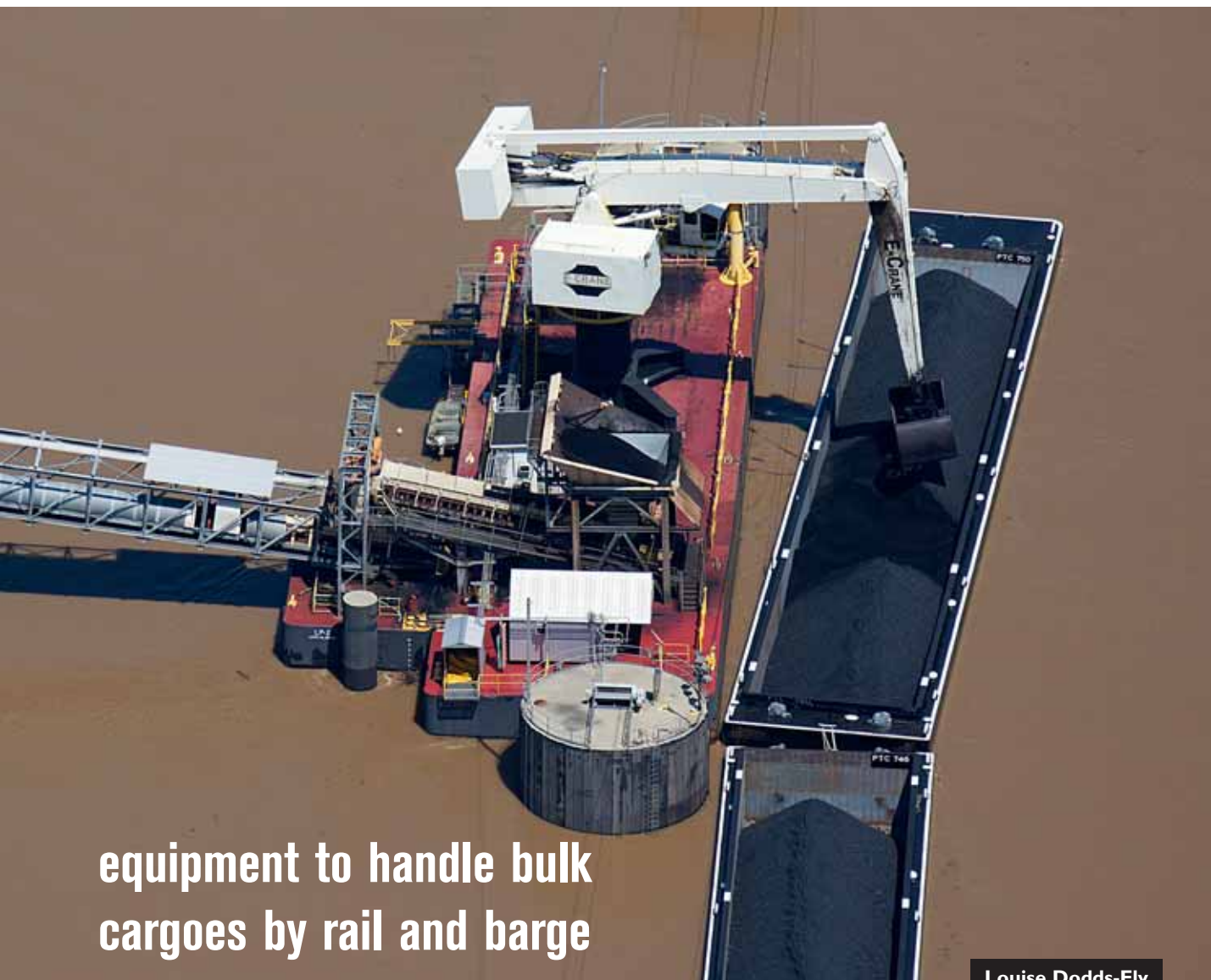
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Louise Dodds-Ely

E-Crane: a technology trendsetter

E-Crane Worldwide, a heavy equipment design and construction company based in Belgium, with subsidiary companies in The Netherlands and in the USA, has been providing reliable solutions to the recycling and bulk handling industries for the past 25 years. The company's equipment is used in a variety of settings, and its equilibrium cranes are widely used — uses include offloading cargo from barges.

Over 25 years ago, E-Crane developed its first balance crane. It is no wonder that today E-Crane has gained widespread support around the world as a reference in balance cranes, because its equilibrium balanced cranes were the very first of their kind. After 25 years of manufacturing, upgrading and modernizing, the E-Crane has evolved into what it is today.

Balance is one of the key factors for any crane in the industry. Over the years, E-Crane has perfected its fail-safe system which guarantees that the crane will always remain in a near perfectly balanced state throughout its entire operating range. The design of the E-Crane is based on an ingenious

parallelogram style boom that provides a direct mechanical connection between the counterweight and the load. Pivoting on its axis, the counterweight moves using hydraulic cylinders. This means that as the load is moved outward, the counterweight compensates by rotating backward. This design is what keeps the E-Crane balanced during its work cycle. Such balanced design has many benefits, including increased efficiency and lower operating costs. Also, thanks to a pivoting counterweight, the loads imposed on the wharf or surface do not result in any uplift, making the E-Crane a suitable solution for mounting on any type of surface or barge.

COMPETITIVE ON THE MARKET

E-Cranes are rapidly replacing conventional dock cranes as they are a more efficient solution and less costly to run and maintain. Instead of a host of levers to control the equipment, there are two joy sticks in the E-Crane operator's cab. Together with exceptional cab visibility they allow accurate positioning of the



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In terms of competition, the E-Crane is placed firmly between production line excavators (or material handlers) and large scale dedicated unloading structures. Even the smaller E-Cranes offer much more unloading capacity than the standard excavator. The larger E-Cranes can compete with dedicated systems in terms of production and come in at only a fraction of the installed cost with even less annual maintenance costs. The E-Crane product line is rated for barge offloading from 500tph (tonnes per hour) to 2,000tph.

CUSTOM DESIGNED UNDERCARRIAGES

E-Cranes can be mounted on a fixed pedestal lower, which takes up the smallest footprint, or a free standing pedestal which requires the least amount of local support. Travelling options include electrically driven rail undercarriages as well as diesel crawlers with electric plug in. The balanced design also provides great stability making it the perfect floating barge mount application. This versatility makes the E-Crane suitable for a huge range of bulk handling solutions. The E-Crane company also now offers its customers complete barge offloading solutions including hoppers, feeders, barge positioning systems, and even floating solutions mounted on deck barges. E-Crane has great expertise in barge offloading, and uses this to design the most efficient systems so that its customers can get as much out of their machines as possible.

CASE STUDY: LOWMAN

One of E-Crane's major successes in floating barge cranes can be found at the PowerSouth Lowman Power Plant on the Tombigbee River near Leroy, Alabama, USA. The centrepiece is a 2000 Series/Model 18264 PD-E E-Crane rated for 1,500tph for offloading coal or limestone.

Previously, Lowman used an old gantry rope crane to unload coal from barges. Since the company now uses a new FGD process which requires the handling of coal and limestone, it needed a faster, more efficient and more versatile barge unloading solution with a higher capacity. Together with E-Crane engineers, a complete and easy solution was determined: an E-Crane floating terminal consisting of a 2000 Series E-Crane, two barges (one for the E-Crane and one to support the conveyor), a hopper, a barge-haul system, and a barge-breasting

LOWMAN STATISTICS

Type	18264 PD-E
Location	LeRoy, Alabama, USA
Application	Offloading coal and limestone from barges
Mount	Barge mounted
Lift Capacity	30 US tons/27 metric tonnes
Reach	86.6ft/26.4m
Attachment	25yd ³ /19m ³ clamshell grab
Power Source	600hp/450kW electric motor

system. The 2000 Series E-Crane has 26.4 m (86.5ft) of outreach and a lift capacity of 27 metric tonnes (30 US tons) and is equipped with a 25-yard bucket which can unload 1,500 tonnes per hour.

E-Crane's hydraulically pivoting, mechanically linked boom design keeps the machine in near perfect balance throughout the working range. Having gravity work for you instead of against you reduces horsepower requirements and power consumption up to 50%. Five series of E-Cranes are available with outreaches up to 50m (165ft) and duty cycle capacities up to 39 metric tonnes (42.9 US tons). A central lubrication system and accessible hydraulics simplify maintenance. E-Cranes' positive grab control allows for precision grab positioning, while the push-down force ensures full grabs for every cycle. The modular machine design concept allows E-Crane engineers to tailor custom solutions for customers' needs.

The barge-haul system provides 'utility grade' unloading equipment and can move one or two loaded 35ft by 195ft jumbo barges with a capacity of 1,500 tonnes. The vector-opposed barge-haul system consists of two opposed winches — one forward, one trailing (upstream/downstream) — that work in tandem with a continuous 7/8-inch-diameter steel cable.

The control system uses dual vector drives, commanded by a PLC, to electrically co-ordinate both winches for maximum barge control. Winch motor speed is monitored continuously by the PLC to eliminate freewheeling or loss of payout control. The barge can be secured against drifting away from the river cell or dock face by a continuous barge-breasting cable. The system can be operated from inside the E-Crane cab or from a remote location.



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Continuous barge pneumatic unloaders have particularly proven their suitability for discharging products such as all types of cereals and oilseeds, raw materials for animal feeding, as well as many other free-flowing products like fertilizers, soda ash, alumina or emerging new commodities such as wood pellets.

PROVIMI DRESSES IN GREEN

In May 2013, VIGAN installed a pneumatic barge unloader at Provimi (part of Cargill Group) in Kaiseraugst, Switzerland. The machine was painted in green to blend in with the forest landscape, and the unloader was mounted on a floating bridge to avoid damaging the environment.

With an unloading capacity of 300mtph (metric tonnes per hour), the pneumatic unloader is equipped with a four-stage turbo blower directly driven by a main electrical motor of 250kW and controlled by frequency inverter (this speed variator enables a flexible unloading capacity from 150mtph to 300 mtph and optimizes power consumption at all times).

The machine's central tower includes high pressure jet-pulse type filter (filtering area of 112m²) on a slewing pedestal mounted on the stationary gantry.

The rotating boom of 15 metres length is completely hot-dipped galvanized, with a lighting system and floodlight for the illumination of the barge hold. The vertical and horizontal telescopic pipes are controlled by remote control boxes (push button and radio types) and VIGAN provided a special cutting

nozzle enabling the suction of less free-flowing material such as soybean meal.

PNEUMATIC UNLOADERS FOR BARGES: AN OUTSTANDING TRIPLE 'E' LABEL

With their numerous advantages compared to grabs or other mechanical devices, pneumatic unloaders have a well-established reputation.

Efficiency: fast and perfect hold cleaning

Speed is a major challenge when unloading barges and other vessels. Speed also refers to the hold cleaning. Mechanical grabs, for instance, offer a high unloading rate at the beginning of





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operations. However, towards the end, the final cleaning of the hold is time consuming, requiring considerable attention from the crane operator and the auxiliary workforce in the barge hold, in order to co-ordinate tasks to achieve maximum efficiency.

The remaining layer of product in the bottom and along the barge hold borders need to be gathered around the lifting up place by the grabs: it is usually quite time consuming (a real nightmare for the manager in charge of productivity targets) and also rather dangerous for the workers.

On the other hand, pneumatic unloaders behave as 'vacuum cleaners' and will efficiently suck the product particles down to the hold bottom. Thanks to the telescopic characteristics of the pipes and the rotating capability of the boom supporting the conveying line, the suction nozzle is also able to reach the hidden corners of the hold.

Most recent attempts with other mechanical continuous unloading systems have failed or have performed poorly when attempting to provide an efficient final cleaning of the barge hold.

A single worker can manage the whole barge unloading process, including when behaving as the driver of the auxiliary 'skid steer' equipment and for final brushing of the products around the suction nozzle.

For barges, it is quite common to achieve an average efficiency rate of up to 80% with a VIGAN pneumatic unloader in comparison to only 60–65 % with grabs for instance.

Environmentally friendly

As well as being painted green, the Provimi unloader is also extremely environmentally friendly:

- ❖ low noise thanks to the insulated machinery room with the turbo blower group and high-performance silencers;

- ❖ no dust around: negative pressure around the suction nozzle and filtering system with a guarantee of less than 10µg per cubic metre;
- ❖ slow movements of the boom with its suction pipes in order to minimize the risks of disturbing nearby wild animals: grab crane movements would have been disastrous; and
- ❖ no spillage which would have caused possible contamination of the river waters with high nitrogen particle for instance. Provimi's pneumatic equipment choice has perfectly integrated good environmental practices.

Energy — low power consumption

Most recent technological developments such as the installation of frequency inverters, direct drive of the turbo blowers, optimized design of the suction nozzle and in general of the whole pneumatic conveying system enable low power consumption. For barge unloading, power consumption is around 0.6–0.7kWh/t.

ADVANTAGES OF BARGE UNLOADERS

Efficient barge unloading is indeed a challenge and a must in most modern industries. Further to those advantages, pneumatic continuous unloaders:

- ❖ are very safe to operate: almost non-existent accident risk; and
- ❖ allow easy and low-cost maintenance.

For many years, the pneumatic unloading of barges has been chosen as the best technique by many large size agri-bulk companies all over the world.

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Vantec funnel bucket ideal for filling bulk containers, including railcars



The Vantec funnel bucket from Verachtert Netherlands is used for the efficient loading of loose dry bulk cargo. A funnel bucket is a shovel bucket with tilting mechanism and hydraulic discharge chute for filling of bulk trucks and/or railcars using a wheel loader.

Because the funnel bucket is highly flexible and can be deployed overall on any site, it eliminates the need for an expensive investment in a separate, permanent material transfer system of silos and conveyor belts at a fixed location.

The funnel bucket is developed entirely according to customer requirements and material to be handled. The funnel bucket can be supplied as a permanent loader attachment or as attachment with a quick change system. Using the funnel bucket brings many benefits. Using the hydraulically actuated chute gate mounted below the funnel bucket, the operator can control the transfer into the bulk container without spillage, and with minimal dust development.

If the bulk container is fully loaded then the excess material



can easily be dumped back onto the heap. The combination of tilting mechanism and ground bumpers ensures that the funnel bucket horizontally scoops the material, and then automatically tilts back into the vertical position for loading. The funnel bucket also saves on personnel costs, because it requires just one person to operate the wheel loader and fill the bulk container.

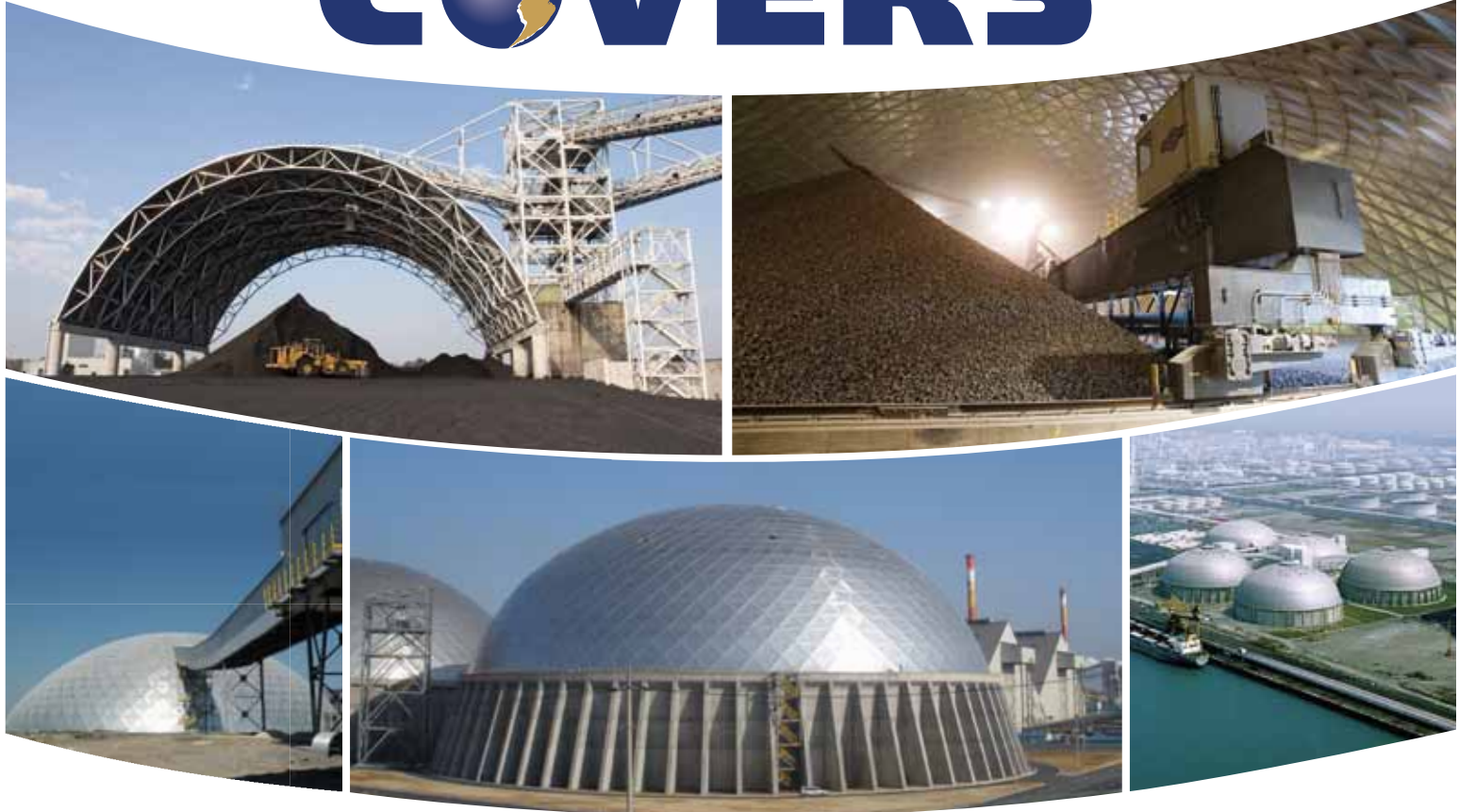
Because the controlled loading and unloading of the funnel bucket is extremely rapid (about 25 to 30 seconds for a volume of 4.5yd³), the Vantec funnel bucket is highly efficient, and pays for itself in no time. The funnel bucket is also available with a feature for filling bulk bags.

Verachtert is part of the Pon company, one of Holland's largest family businesses and the holding company of a group of companies operating in mobility-related industries in countries worldwide. With 60 years of experience in the trade, Dutch company Verachtert has earned

international recognition as a specialist in work tools for excavators, wheel loaders and cranes of all brands. From its home base in 's-Hertogenbosch (NL) the company engineers and sells products such as quick couplers, buckets, grabs, shears and hammers, which are widely recognized in the industry for quality and productivity. Its customer base includes international clients operating in earthmoving, road and water engineering, demolition, scrap metal processing, recycling, general industry and bulk handling. In many cases the products are designed and engineered to meet the customer's specific needs and wishes. All work tools are supplied inclusive of an extensive services package, covering expert advice in choosing the best tool for the job through to maintenance and repair services. Moreover, the company prides itself as a major European supplier of pre-owned worktools.

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Rail and barge integration – how can it be done: Bedeschi shows the way

The land and sea linkage in the dry bulk transportation link is of great importance to ensure uninterrupted offshore loading operations of the commodity, writes *Sanjeev Mathur, Bedeschi*. This can only be achieved with meticulous planning and in-depth knowledge of all aspects of bulk material handling. A typical coal export chain may involve the following independent segments:

- ❖ mining;
- ❖ inland rail transportation;
- ❖ unloading and receipt;
- ❖ stacking, blending and reclaiming;
- ❖ transportation to barge loader;
- ❖ loading onto barges;
- ❖ barge transportation; and
- ❖ offshore transshipment.

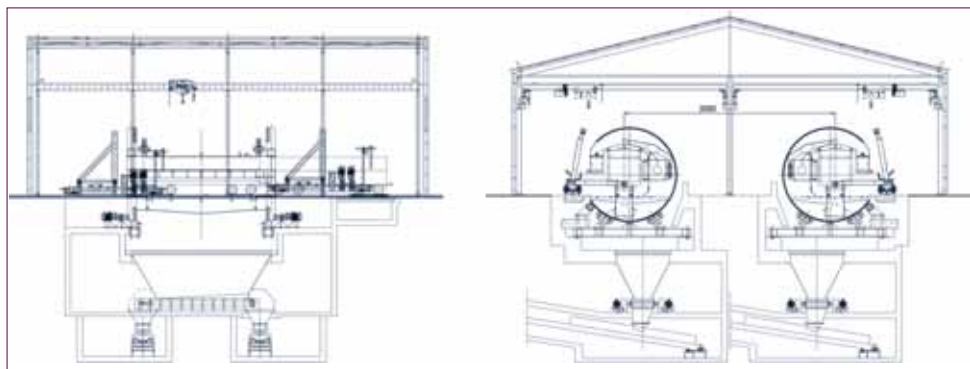
Bedeschi with its 103 years of experience in the field of cargo handling systems has the capability and experience of implementing such systems in various parts of the world handling diverse kinds cargo.

Basically, on the port side the operation involves extracting the coal from the large underground hoppers by way of variable belt-driven apron feeders. These then transfer the coal to the conveyor systems transporting the coal to the stockpile for temporary storage. Stackers covers all the equipment meant for preparation and storage of coal in piles or storage outdoor or indoor. Reclaimers are the equipment necessary to recover the material from the storage and convey it to the downstream process. Bedeschi manufactures various kinds of stackers and reclaimers depending on the major types of storages, viz.:

- i. longitudinal
- ii. circular
- iii. sidewall

Various kinds of stackers are manufactured by Bedeschi depending on the kind of stacking required, viz:

- i. travelling stacker
- ii. travelling and slewing stacker
- iii. circular slewing stacker
- iv. bridge stacker
- v. travelling and shuttling conveyor system



Similarly the type of reclaimer manufactured by Bedeschi can be generally characterized as bellow:

- i. frontal
 - a. frontal with rake
 - b. with lateral walls and buckets

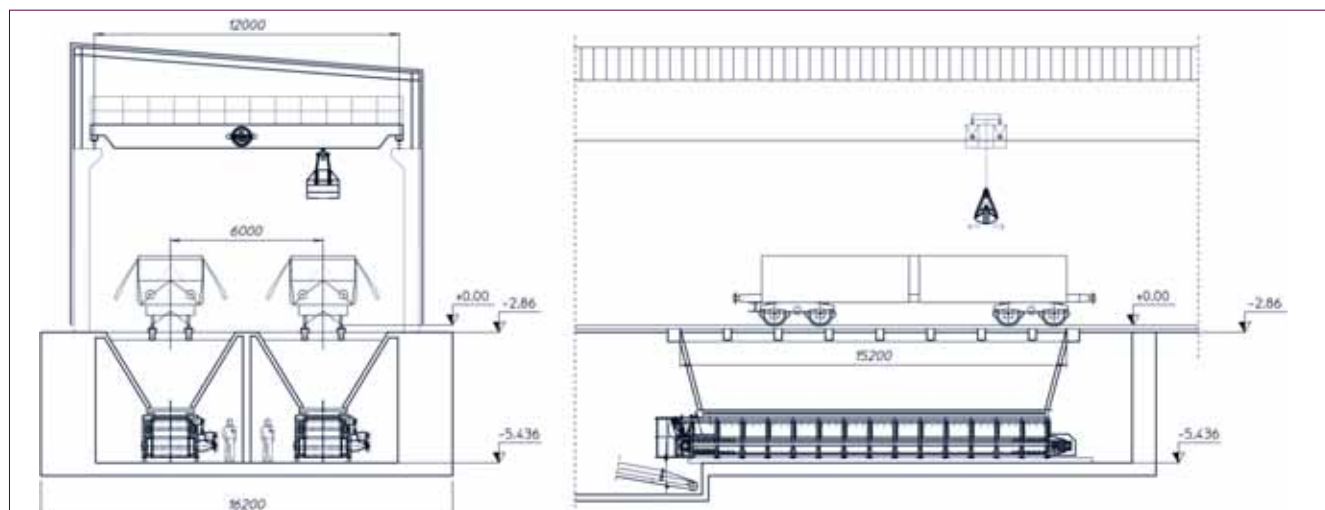


- ii. lateral
 - a. lateral cantilevered
 - b. portal
 - c. semi-portal

In addition to the above, Bedeschi also manufactures all kinds of circular stackers and reclaimers as well as high-capacity bucketwheel stacker/reclaimers.

Once the coal has been reclaimed from the stockpile, it is transported to the barge loading jetty to be connected to a barge loader. The barge loaders can also be of various kinds, viz:

- i. fixed type (with slewing and luffing capability)



ii. travelling type

Both the fixed type and travelling type of barge loaders can be of:

iii. retractable boom

iv. shuttle type boom

The main features of the barge loaders is that they should have sufficient outreach to be able to deliver cargo into all parts of the barges and also have luffing and slewing mechanism. Another important criterion is the capacity of the barge loader — Bedeschi has designed barge loaders up to 6,000tph (tonnes per hour) capacity for a project in Australia.

The barge loader and the reclaimer are electronically interlocked to control the flow rate. The reclamation process and the connected conveyor system stop the moment barge loading operation stops. Optional items like metal detection systems, online weighing scales and automatic sampling devices can also be installed on the barge loaders.

After the barges are loaded alongside the berths, they either transport and deliver the coal directly to their destination where they are unloaded on shore or they transport the coal to an offshore site where the coal is transferred onto ocean going vessels. This transfer of coal from the barges can either be done by using the ship's gear or by using a transshipment device like a floating crane or a floating transfer station. These floating transfer stations are equipped with shiploaders; Bedeschi is a



major manufacturer of shiploaders. Six shiploaders of various kinds supplied by Bedeschi are in operation in Indonesia alone, which are used to load coal into ocean going vessels of various sizes.

Bedeschi has successfully pursued the strategy of expanding beyond port and stockpile cargo handling facilities and, thanks to the support of Logmarin Advisors and Liebherr (when integrated solutions are required), can work with its valued clients to find the most efficient integrated cargo handling solutions for loading, unloading and storage dry bulk commodities at any stage of the supply chain.

Bedeschi, Logmarin and Liebherr (a major global maritime crane supplier), which are the individual constituents of the consortium Bulk Logistics Landmark (BLL), firmly believe that only state-of-the-art, integrated solutions are successful in the long term. Properly planning the whole project means improving operating efficiency, productivity

and cutting future maintenance time and costs: high-level engineering leads to profitability maximization.

Since each project has its own features, BLL works together with the client in order to provide cost-effective and reliable cargo handling solutions: by merging skills and expertise with its partners, Liebherr and Logmarin, Bedeschi provides dependable and complete projects to convey the dry bulk commodity to industry smoothly and efficiently.



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Bühler's Bargolink supplied to Vupik: efficient unloading and loading in Croatia

In January 2010 Vupik became a member of the Agrokor Group and a major investment cycle directed toward increasing the production and market competitiveness has been initiated, writes Vincent van der Wijk, product manager at Bühler. One of the actions initiated to increase the competitive position and secure the vision of becoming a leader in agriculture of the region has been the investment in the Bargolink.

Vupik's activities include viticulture, fruit-growing, cereal farming, vegetable-growing, pig farming, cattle farming, grain storage in silos, agricultural co-operative and wine tourism. Having over 7,000ha of top-grade arable land on the fertile banks of the Danube, Vupik has potential to yield top results in grain, oil crop and vegetable production.

To increase the competitive situation of Agrokor and Vupik and to reach the vision of becoming a leading agricultural production company, Bühler has received the order to produce and install the Bargolink as a part of the total overhaul and improvement of the storage and process facility in 2010.

Bühler could convince Vupik from the concept of the Bargolink which has been specially developed for the unloading of barges. To enable multi-use of components, the Bargolink for Vupik has been specially constructed with a loading spout facilitating the loading of barges.

Especially important for the decision have been the high unloading capacity of barges, low maintenance costs, economic use, and reduced energy costs. Moreover, environmental protection has been seen as superior in comparison to other unloading equipment. With the absence of rails on the quay, Bühler has supplied the stationary version of the Bargolink including a towing system to move barges. With this system the advantages of increased efficiency and easy handling connected with a travelling unloading system, and the limited investment and space requirements of a stationary system have been combined, resulting in the best of both systems.



The easy handling by remote control increases efficiency and saving time and reducing manpower per unloaded barge.

TECHNICAL DETAILS BARGOLINK

The Bargolink for Vupik has a loading and unloading capacity of 200tph (tonnes per hour) and is developed for barges up to 3,000dwt.

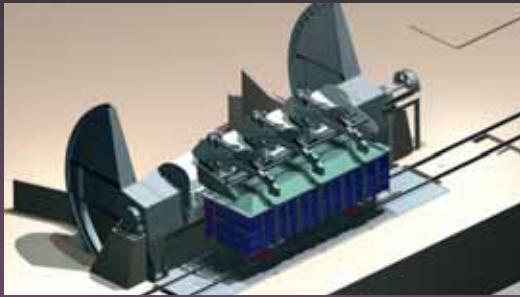
ABOUT BÜHLER

Bühler is a global technology leader which specializes in the supply of equipment, systems and services for the conversion of renewable resources derived from food and synthetic substances into top quality functional products and materials. Bühler operates in over 140 countries and has some 10,000 employees worldwide. In fiscal year 2012, the group generated sales revenue of CHF 2,409 million.

SCHADE wagon tippler for Russia

Kaluzhskiy Cement is building what will be one of the largest and most modern cement plants in Russia with a design production capacity of 3.5 million tonnes per year, writes *Matthew Jones* – SCHADE Lagertechnik (AUMUND Group). The plant design is based on best practice engineering and environmental standards in compliance with European and World Bank standards, due for commissioning in 2014.

Limestone will be sourced locally from the extensive deposits found throughout the Kaluga Oblast but other materials such as bauxite, iron ore, gypsum and slag will be imported by rail and road using the new intake facility designed specifically for this installation by the SCHADE engineers based out of their office at Bristol in the UK. SCHADE has developed a range of wagon tippler concepts including the standardized 'O' Frame and 'C' Frame designs, but, for this project, the SCHADE 'Pivot-Frame' system was chosen both for its flexibility in plant layout and the ability to combine the tippler with an automated wagon charger to move the wagons into and out from the tippler working zone. With the Pivot-Frame design the associated hopper may be placed beside the tippler giving access for road trucks



to discharge to a common feeder; another cost saving feature of this plant.

After examining the client's site survey SCHADE engineers immediately realized the rail track routing to and from the tippler would be potentially a major issue with level ground on the entry side but on the exit side the

ground fell away sharply potentially requiring many thousands of tonnes of back-filling to level the track. With some 'outside-the-box' thinking, SCHADE offered a novel solution with a wagon traverser to allow the wagons to enter and exit from the same side of the tippler location using parallel track avoiding the extensive backfill operation. This will be phase 2 of the project offering in addition to the clear benefit in track-work and civil engineering costs the parallel track system will allow the introduction of a second track hopper for bottom discharge wagons whilst using a common conveying system.

SCHADE offered the client a flexible solution tailored for its specific needs considering both the operational demands and site geography to arrive at an economical and efficient layout without sacrificing performance or reliability, delivering innovative dependable materials handling systems.

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OVET unveils new rail wagon loader



As from 1 July, OVET will have its new rail wagon loader available at its terminal in Vlissingen/Flushing. This new piece of equipment will allow OVET to load a train with 44 wagons (approximately 2,700 tonnes net), with a speed of up to 1,500tph (tonnes per hour) with bulk products.

The port has excellent rail connections, rail paths and shunting services. Different rail companies are present in the port. With these facilities, OVET is capable of expanding coal rail transport towards the European hinterland, mainly to supply the German power and steel industry.





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NEW: TRAIN LOADING STATION
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OVET B.V. offers a wide range of stevedoring services in the Netherlands. It handles bulk commodities, such as: coal, coke, pet coke, ores, minerals, biomass and scrap. The main activities of OVET are discharging, lightening, storing, distribution and screening of dry bulk cargo.

OVET operates at two deep water terminals, both with paved stockyards:

- ❖ **Vlissingen/Flushing** (Capesize) with a storage capacity of 315,000m² — 2,000,000 tonnes; and
- ❖ **Terneuzen** (Panamax) with a storage capacity of 160,000m² — 600,000 tonnes.

Using four floating cranes (3 × 25 tonnes and 1 × 36 tonnes lifting capacity) with a total capacity of 80,000 tonnes per day, OVET also has the flexibility to operate at anchorages, both in Terneuzen and in Vlissingen. To increase flexibility here, OVET has also recently invested in a new mobile crane for its Vlissingen terminal. This Multidocker CH85C, with a maximum reach of 27 metres, is capable of loading and discharging barges, coasters, even up to Handysize vessels.

The draught in Terneuzen is set to 12.50 metres freshwater, making the terminal suitable for Panamax vessels. In Vlissingen, the draught is 16.50 metres saltwater. Vlissingen has two

Capesize berthing facilities plus 1 Panamax berth.

With an annual handled tonnage, which exceeds 10 million tonnes, OVET plays a significant role in the dry bulk stevedoring market. Both ports offer excellent hinterland connections (inland waterways, rail and road) to Benelux, France and Germany and are perfectly situated for short sea shipping to Scandinavia, UK and Ireland.

At the terminal in Vlissingen, OVET operates a warehouse of 6,000m², which can be used for storing wood pellets, minerals and agricultural products. The warehouse contains six separate cells with a total capacity of 45,000m³.

Affiliated to OVET is OVET Shipping, which offers a reliable 24-hour shipping agency service throughout the River Scheldt area. The agency guarantees an efficient and effective handling of customers' vessels.

Another affiliate of OVET is OVET Screening, a company which is specialized in screening, crushing and blending activities. At both terminals OVET operates (mobile) screening and crushing installations. In 2012 investments were made in two new mobile screening installations for the Vlissingen terminal. With these machines, OVET is capable of screening dry bulk material up to 5 fractions with a input capacity up to 400tph.

Automated rail wagon loading system for fertilizer bags at Indian port terminal

INTRODUCTION

Frigate Teknologies is a diversified global conglomerate providing integrated design, engineering, procurement, construction and project management services in aviation, cement, energy, marine, mineral processing, steel and other associated downstream sectors, writes Anirban Bhattacharya, managing director.

The philosophy at Frigate is based around 'rational processes'. That is, a client's technical requirements, expectations, budget, time scale are analysed, and only then is the optimum, best-value solution proposed. Frigate prides itself on its flexibility, and being attuned to its customers' needs. The company is able to offer a full service, from consultancy to EPC contract, including the supply of critical spare parts.

Frigate strives to be a model company, applying best practice in all its operations. It partners with the best organizations in the field, bringing technologies and quality to its clients worldwide. It has an excellent track record for successful completion of projects within tight schedules, and its success

means that it often wins repeat orders.

PROJECT BACKGROUND

In 2012, the Indian office of a major European terminal operator approached Frigate. This terminal operator is one of the largest terminal operators handling fertilizer in the western coast of India.

Incidentally all such port facilities in India rely heavily on manual labour for the handling of packed 50kg bags. The involvement of manual labour is predominant across every unit operation. However the economies of scale tilts when one looks at the amount of manual labour required for pre-stacking of fertilizer bags on the platform, and thereafter again handling it for loading into railway wagons.

The principle need was to mechanize the handling of the filled bags (i.e., after the packing machine) for eventual loading of the railway wagons.

The challenge was to turn around a railway rake in eight to



Packing station.



Transverse conveyor.



Bus bar system.



Bag diverter on feed belt conveyor.



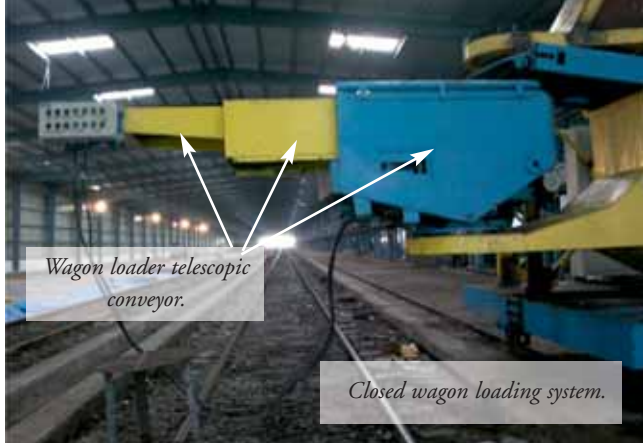
Open wagon loading system.



Closed wagon loading system.

Intermediate conveyor.

Feed conveyor.



Wagon loader telescopic conveyor.

Closed wagon loading system.



Closed wagon loading system. Wagon loader inside wagon.



Closed wagon loading system. Wagon loader inside wagon.



Closed wagon loading system. Wagon loader inside wagon.

nine hours against the current turn-around time of 20 to 24 hours. Needless to say that the existing system entailed huge demurrage charges from the railway authorities.

PROJECT OBJECTIVE

The client laid out a simple yet tough challenge. The goals thus set were:

- ❖ discharge of vessel in 3.5 days;
- ❖ achieve discharge rate of 10,000 metric tonnes per day on a consistent basis;
- ❖ scale up capacity to handle 3mtpa (million metric tonnes per annum) = three rakes per day (59 wagons/rake): BCN-HL, BOX N, BOX N-HL, BCN, BCNA, BCNA-HS wagons;
- ❖ railway rake loading turnaround time to be kept below nine hours, to avoid demurrage costs;
- ❖ eliminate physical and financial losses due to excessive handling;

- ❖ reduce operational costs;
- ❖ make a fully reliable handling system in tune with business goals; and
- ❖ cater to ever-changing wagon type/size from railways.

PROJECT CONCEPT

Frigate set out to simplify the material flow after the slat conveyors. The flow sheet shows the concept wherein Frigate had to specifically develop a design for a wagon loader which can load bags into closed wagons as well as open top wagons

Another challenge for the project was the location of the intermediate columns of the covered storage shed. Due to the limited available space between the building column and the existing railway line, it was essential to sandwich the yard conveyor.

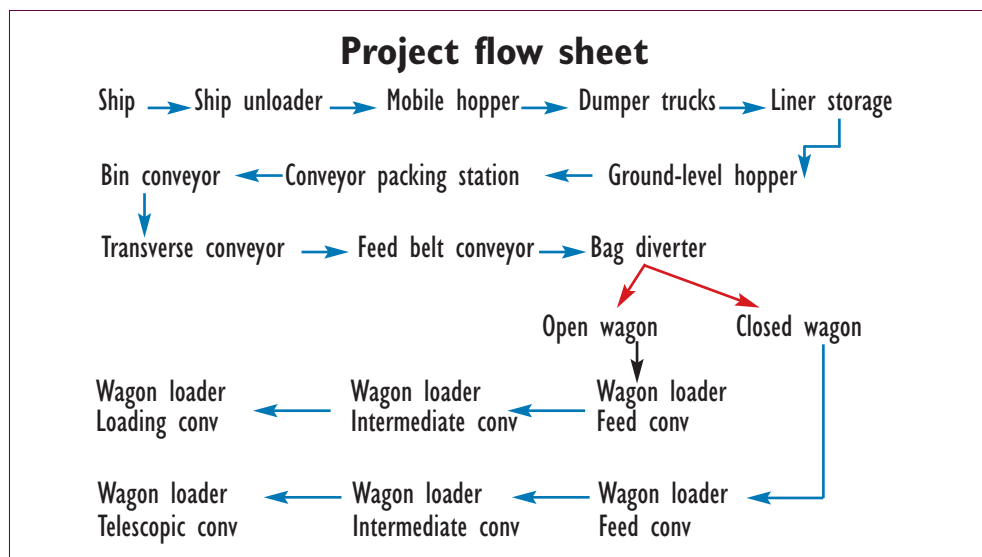
Moreover, due to the synchronous movement of the wagon loader and the bag diverter, the yard conveyor could not be designed typically with shortposts and stringers.

Frigate solved this handicap, by designing the entire conveyor on a single legged support.

PROJECT STATUS

As of July 2013, Frigate has commissioned and handed over all seven wagon loading machines (and associated material handling systems) to the client.

In addition to the turnkey execution of the project, Frigate is also offering O&M (operation and maintenance) services to the client.



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

Fig 1. Mobile truck unloader (track mounted) loading barge directly from trucks and wheel loaders — 21 metre (70ft) radial boom conveyor — integrated gen-set all electric driven



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 a 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.

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 etc.... all 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 installation 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 and plug in the 3-phase electrical supply 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. In addition 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 also 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 complete with dust enclosures, dust extraction and a telescopic discharge chute.

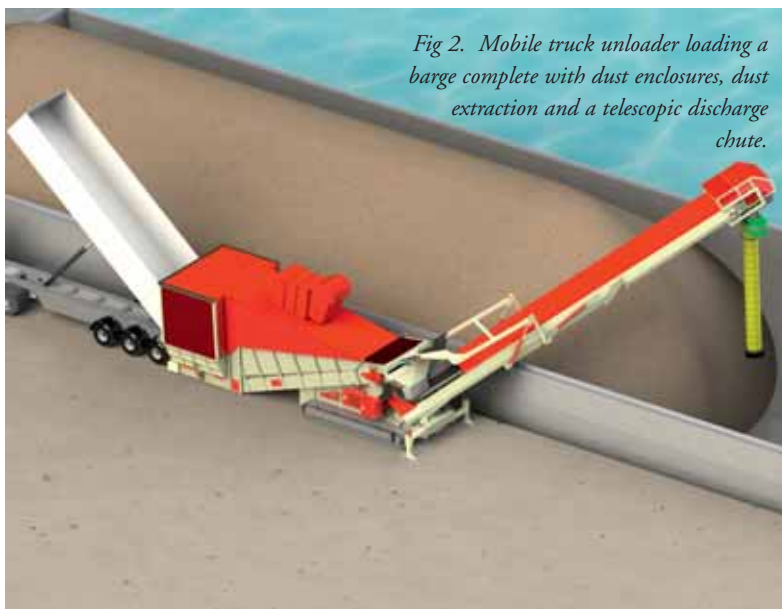


Fig 3: Mobile truck unloader loading barges directly from trucks in the USA.



Typically, the range of truck unloaders can handle trucks up to a 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 on p75, 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.

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 that 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

Telestack's range of truck unloaders can also be used with Telestack'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 (below), the radial telescopic technology offers unrivalled trimming capabilities without moving the truck unloading 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 a 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

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)



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.



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Fig 6.

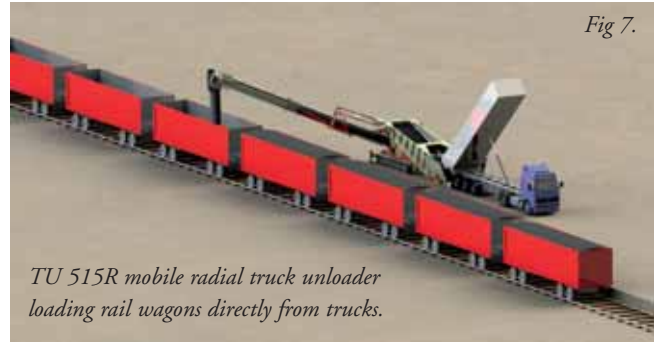


Fig 7.

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

monitored. This ensures the operator cannot be liable for any 'overloading' 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° degrees 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.

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 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



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.

possible accidents. The radial conveyor can 'trim' all areas of the wagon easily from one single feed-in position, eliminating downtime and ensuring accurate loading.

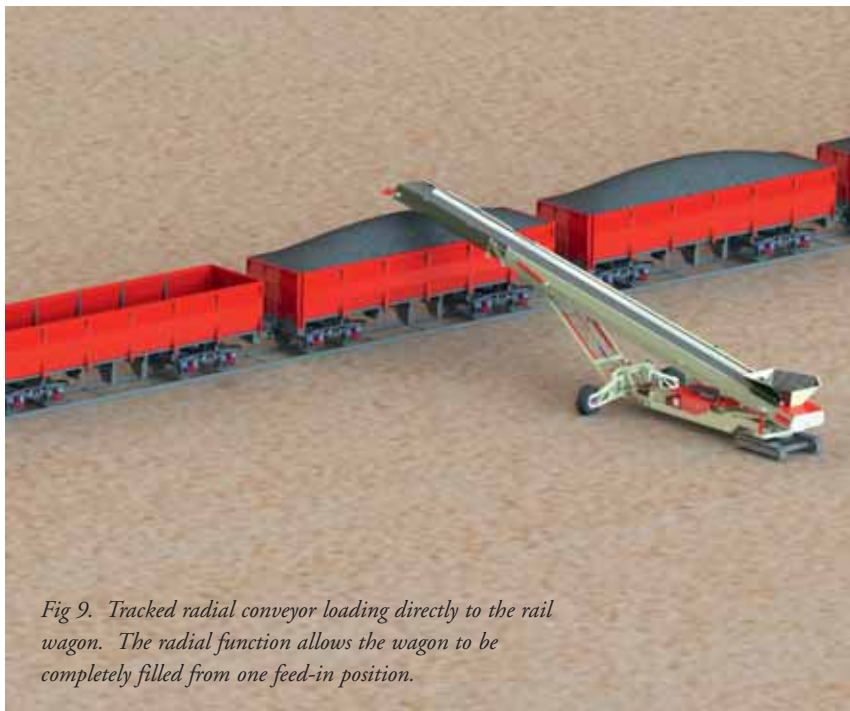


Fig 9. Tracked radial conveyor loading directly to the rail wagon. The radial function allows the wagon to be completely filled from one feed-in position.

TELESTACK UNITS FULLY BUILT AND TESTED IN FACTORY BEFORE DISPATCH

Telestack products are fully designed and manufactured in the 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 etc. before being packed for transport (either containers or ro-ro). This ensures high quality design and manufacturing 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.

DCi

Twin crane christening



Cooper/Consolidated partnership celebrates 10th anniversary in style

Cooper/Consolidated, a strategic partnership between Cooper/T. Smith Corporation and CGB Enterprises, Inc., celebrated its 10th anniversary and the christening of new twin National Oilwell Varco (NOV) AmClyde™ model 28 floating cranes, the *High Tide* and *Bob Frane*, at a May 13th ceremony on the Mississippi River, just outside the Hilton Riverside in New Orleans.

The *Bob Frane* was named in honor of the late Robert E. 'Bob' Frane, founder of Consolidated Grain & Barge Company. "Bob was an innovator and visionary in the grain and barge industry," said Scott Leininger, vice president of CGB. "Bob's leadership changed the way barge freight was purchased and sold. It allowed barges to be merchandised the same way commodities were being traded. The practice is utilized across the dry cargo business to this day."

Peter Frane, Bob's son, also spoke at the event: "I'd like to congratulate the people of both Cooper/T. Smith and CGB on the ten-year anniversary of their Cooper/Consolidated partnership," he said. "What a fitting way to celebrate another

partnership of two great companies than with the christening of two new cranes. I'm sure these cranes will be the pride of the fleet."

Angus R. Cooper III, Group President of Operations at Cooper/T. Smith, said the *High Tide* was named to symbolize the highest point of technology after three generations of the AmClyde™ 28. "These cranes are stronger and faster than anything their size," Cooper said. "They also remind us of the Alabama Sports programme: that winning is about teamwork and never being satisfied. Our strategic partnership with CGB is one reason we have been able to thrive for the last ten years."

The cranes' new features drive higher performance and enable greater efficiency for the companies' customers, as well as increase safety, productivity and facilitate training for employees. Reduced noise and emissions are beneficial to workers, residents and the environment.

The new features include:

- ❖ rated for 100,000 lbs gross bucket work and 310,000 lbs gross hook work;



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Harry Compton christens the Bob Frane — family members from left to right: Janet Frane, Harry Compton, Sophie Frane, Molly Frane, Rosie Compton.



Claire Ellen Cooper Stephens christens the High Tide.

- ❖ XQ2000 Caterpillar Gen-Set with a sound attenuated container, which reduces noise, and powers the crane's AC variable frequency drives;
- ❖ equipped with Wintech CP35000 electric drive winches;
- ❖ no hydraulics of any kind, eliminating the necessity to transfer fluids and the potential for leaks, as well as reducing repair time and expense;
- ❖ 150ft of boom, with LED lights running the length and a camera at tip for increased visibility and safety;
- ❖ additional safety cameras in the machine house and electrical room to confirm when workers are on deck;
- ❖ capability to connect to onboard systems via WiFi, allowing monitoring of the crane, as well as tracking real-time production statistics and maintenance from remote locations;
- ❖ improved swing gearboxes shave 10–20 seconds off swing time per cycle;
- ❖ overspeed feature keeps loads moving within safe parameters;
- ❖ two-cable load sharing system decreases wear on the cables, as well as reducing breakage;
- ❖ fully functional dual operating stations in the cab and machine house;
- ❖ crane controls moved into a pair of joysticks, reducing employee fatigue factor and increasing ease of training; and
- ❖ cab raised to give operators better vision over larger post-Panamax vessels.

American-fabricated and assembled, the new hydraulics-free cranes are the result of safety, efficiency and environmentally friendly features originally designed and tested in the recently fully refurbished *Marilyn G*, an AmClyde™ 28 tub-mounted

stevedoring crane in the Cooper/Consolidated fleet originally built in 1982.

“We started the *Marilyn G*'s refurbishment in November of 2010,” explained Wendell T. Landry, Vice President of Operations & Maintenance at Cooper/T. Smith. “We picked her because she has a twin, so all the changes we made to her we could turn around and duplicate without having to start over from the beginning.”

With the proven success of the *Marilyn G*, the decision was made to build two new cranes. “We decided to copy her with some improvements,” said Landry. “We ordered both at the same time. The *High Tide* went into service in December 2012 and the *Bob Frane* just this month.”

With a third new crane in the works, and several in the pipeline for the refurbishment programme, Cooper/Consolidated is positioning their business for steady growth in the years to come.

“We've been operating AmClyde™ equipment for 30 years, and studying new equipment for our refurbishment programme the past eight years,” said Cooper. “Regardless of the expense, the reliability of AmClyde™ is second to none. That's why we've decided to entrust another 30 years and beyond of our business to them.”

“We've been known for our consistency and reliability for many years and these cranes play a major role in supporting one of our greatest strengths, the seamless door to door logistics packages we provide our clients,” says Brent Mahana, Director of Sales & Marketing for CGB Enterprises, Inc. “They emphasize our commitment in continuing to be an industry leader in all facets of marine transportation and inland logistics.”

COOPER/CONSOLIDATED

Cooper/Consolidated is a joint operating, sales and marketing partnership between Cooper/T. Smith Stevedoring and Consolidated Terminals and Logistics Co. (a division of CGB Enterprises). Specializing in a variety of transportation and handling services, Cooper/Consolidated employs a strong, diverse asset base that covers many of the industry sectors they serve—providing clients around the globe with diverse logistics solutions for one seamless journey, with a focus on the inland waterways and lower mississippi river regions. services include: stevedoring, barging, trucking, inland terminalling, vessel chartering, rail, project cargo, and marine logistics.

DCi





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ORTS GmbH

Terex Port Solutions continues success on the Mississippi River



As well as midstream transshipment, the Terex Gottwald floating cranes will also be deployed in the dock site concept developed by St. James Stevedoring Partners, L.L.C.

St. James Stevedoring Partners, L.L.C. orders two more Model 8 floating cranes

Terex Port Solutions (TPS) is expanding its presence on the Mississippi River by supplying two Terex® Gottwald Model 8 floating cranes to St. James Stevedoring Partners (SJS), L.L.C., based in Convent, Louisiana, USA, near New Orleans. These two cargo-handling machines will be configured as four-rope G HPK 8400 B crane variants for professional bulk handling. From this summer on, SJS will be operating a total of ten Terex Gottwald floating cranes, including four G HPK 8400 B units, making it the world's largest operator of floating cranes from TPS.

TEREX GOTTWALD FLOATING CRANES FOR MIDSTREAM OPERATION ...

The G HPK 8400 B is the most powerful Terex Gottwald floating crane with a maximum lifting capacity of 100 tonnes and a 63-tonne grab curve, which can handle as much as 1,850 tonnes of bulk materials per hour depending on local conditions. The two new cranes will increase SJS's handling capacity in transshipping ores, coal, grain and fertilizers from ocean-going vessels to inland water vessels midstream.

... AND FLOATING DOCK USE WHERE WATER LEVELS FLUCTUATE GREATLY

As well as operating midstream, these cranes will be used in conjunction with SJS's docksite concept, which was designed as an alternative to transshipping ocean-going vessels to barges. This innovative concept involves using a floating dock equipped with a full infrastructure, including hoppers and conveyor systems, close to the river bank.

The system compensates for changes in water level and allows bulk materials to be unloaded and conveyed to a land-based storage area even during considerable seasonal fluctuations in the water level. The Terex Gottwald floating cranes, each mounted on a barge, simply moor alongside the floating dock and unload the bulk material from the ocean-going vessel and transfer it to the hoppers.

TECHNOLOGY TAILORED TO NATURAL SURROUNDINGS

According to Paul Morton, president of St. James Stevedoring Partners, L.L.C., it is also the natural site conditions on the

Mississippi that contribute to the success of the Terex Gottwald floating cranes: "Construction work for new, permanent berthing facilities is excessively costly, which is why we were on the lookout for additional high-performance solutions to complement our midstream handling capabilities. Thanks to this dock site concept, we can now respond that much quicker and more flexibly when unloading ocean-going vessels." As with midstream handling operations, Terex Gottwald floating cranes fit in ideally with the concept of temporary handling infrastructures consisting of a floating crane, floating dock and conveyor system: "This enables us to deploy both the cargo-handling cranes and our staff flexibly, which keeps overhead down and maximizes fleet utilization," explains Morton.

CONTINUOUS IMPROVEMENTS IN EFFICIENCY

Bob Histon, General Manager North America of TPS, underlines the key role played by this customer in the success story surrounding Terex Gottwald floating cranes and the latest order: "We developed the first floating crane, a Generation 4, HPK 330 EG, in 2004 together with SJS, which enabled us to supply them with a handling machine to their exact requirements and catered for all the site conditions. In the last nine years, Terex Gottwald floating crane technology in use on the Mississippi, which was derived from our mobile harbour cranes, has taken the lead in this field," Histon continues. "Thanks to a programme of continuous development of this crane type, its efficiency has steadily increased, which has helped our customers to take full advantage of the growing business potential of the Mississippi."

CONTINUED INCREASES IN DEMAND FOR LEADING TECHNOLOGY

Terex Port Solutions continues to show success with its customer-focused innovation strategy by providing cranes to

meet the ever-changing needs of the customer. By continuously improving harbour crane technology and combining it with various bases, like barges for St. James Stevedoring, customers along the Mississippi River are seeing the benefits of efficiency and greater productivity with Terex Gottwald cranes. On average, two new cranes are supplied each year to the Mississippi, but their key benefits are also in demand in other locations: the two new cranes ordered by SJS will now raise the number of Terex Gottwald floating cranes in use on rivers and the open sea to a total of 29.

ABOUT TEREX PORT SOLUTIONS

Terex Port Solutions is part of the Terex Material Handling & Port Solutions business segment that supplies customers in ports with a unique combination of machines, software and services under the Terex and Terex Gottwald brands. Whether it is ship-to-shore cranes, reach stackers or fully automated, integrated handling systems for containers and bulk, Terex Port Solutions provides reliable solutions for rapid, safe, efficient handling of all forms of cargo with low downtimes and excellent return on investment.

ABOUT TEREX

Terex Corporation is a diversified global manufacturer of a broad range of equipment that is focused on delivering reliable, customer-driven solutions for many applications, including the construction, infrastructure, shipping, transport, quarrying, mining, refining, energy, utility and manufacturing industries. Terex reports in five business segments: Aerial Work Platforms; Construction; Cranes; Material Handling & Port Solutions; and Materials Processing. Terex offers financial products and services to assist in the acquisition of Terex equipment through Terex Financial Services.

From this summer on, two more G HPK 8400 B cranes, variants of Model 8, are scheduled to strengthen SJS's Mississippi fleet and make the company the biggest user worldwide of Terex Gottwald floating cranes.



... and supplies 30th floating crane to USA's largest port

ASSOCIATED TERMINALS LLC ORDERS TEREX® GOTTWALD MODEL 8 CRANE

Terex Port Solutions (TPS) has sold its 30th floating crane since this harbour crane type, based on mobile harbour crane technology, was launched in 2004, strengthening its position in this field of handling machinery. The Model 8 crane was ordered by Associated Terminals LLC (AT), based in Reserve, Louisiana, USA, for its bulk handling operations in the Port of South Louisiana and will be configured as a G HPK 8400 B four-rope grab variant. The Port of South Louisiana stretches upriver along the Mississippi for more than 87 km (54 miles) from New Orleans, making it the largest port in the USA.



Rapid handling to deal with increased freight volumes

By purchasing the 30th floating crane made by TPS, AT is expanding its own fleet of Terex® Gottwald floating cranes to eight. The new crane will enable the company to increase its handling capacities significantly, as Gary Poirrier, director at Associated Terminals LLC, explains: "Our customers are faced with constantly increasing freight volumes coupled with rising cost pressure and this is why they expect us to handle their freight without delay. Since TPS transferred its high-performance mobile harbour crane technology to floating cranes, AT has been able to keep abreast of requirements," continues Poirrier, who is additionally pleased that his company is the recipient of the 30th Terex Gottwald floating crane: "We would like to congratulate TPS on this milestone and are proud to be part of this remarkable development."

Floating cranes based on mobile harbour crane technology — a resounding success

Once the new crane is delivered to AT this summer, there will be a total of 19 Terex Gottwald floating cranes on the Mississippi River — home of the first floating crane in 2004. This development shows very clearly how quickly these flexible cargo handling cranes have become established, as Giuseppe Di Lisa, vice president of sales and service at Terex Port Solutions, emphasizes: "The Mississippi River has contributed its own special chapter to this success story, but we have also been able to demonstrate very successfully the benefits of our floating cranes to operators in other parts of the world." A further contributing factor in this success, according to Di Lisa, is the fact that TPS is continuing to develop alongside its customers, "The first crane to go into operation on the Mississippi River was a Generation 4, HMK 330 EG, then followed several Generation 5, Model 6 cranes, variant G HPK 6400 B, and today we are offering our customers the particularly powerful Model 8 floating cranes."

Proximity to the customer as a success factor

The principle of continued joint development and proximity to the customer also plays a key role in TPS'S customer service activities. Due to the large number of floating cranes on the

Mississippi River, Terex Port Solutions will be inaugurating a new service centre in La Place, Louisiana, in August 2013. Managed by Jason Dupont, this will be the central location in the Port of Louisiana to service customers quickly and efficiently.

In use worldwide — in all waters

Terex Gottwald floating cranes are suitable for all types of cargo and a wide range of handling scenarios. These high-performance machines come into their own in ship-to-ship transshipment as well as ship-to-quay handling, whether in ports, on-shore waters or on the open sea. For example, there are currently five floating cranes operating in the coastal waters of Indonesia in professional bulk handling. These Terex Gottwald cranes have been designed and built in accordance with Lloyd's Register Code for Lifting Appliances in a Marine Environment, and are approved for operation on the open sea, able to work in wind speeds of up to 24m/s and wave heights of up to 2.5m.

Providing flexibility right from the start

Irrespective of the working environment, floating cranes offer the ideal combination of flexibility and efficiency. As mobile machines, they are independent of the quay structure — which avoids high specific investments in corresponding infrastructures — and always ready to go into action, with their crew, wherever they are required. This allows operators to utilize their fleets efficiently.

The flexibility of the concept begins with the overall design and configuration of the crane: in most cases, TPS supplies the floating crane from the slew ring up and combines the machine with a barge provided by the customer. It is possible to supply a number of different variants to meet specific customer needs, including turnkey solutions and certification with Lloyd's Register. It is even possible to install the crane on a self-propelled barge to enable the crane to navigate alone without the need for a tug.

Thanks to the modular design and construction as well as an advance order programme, Terex Port Solutions' customers benefit from short delivery lead-times and comparatively low investment costs.

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Cutting-edge unloading



Coperion double-boom vacuum ship unloader.

What should a state-of-the-art vacuum ship unloader look like?

Coperion is a leading supplier of pneumatic vacuum ship unloaders for the unloading of alumina and petcoke from seagoing vessels. In 2007, the company Hartmann — which has over 100 years of experience in the field of pneumatic ship unloading — was incorporated into Coperion.

Coperion's vacuum ship unloader's design can be adapted to suit the climatic conditions of the site where it will operate. Designed unloading capacity ranges from 150tph (tonnes per hour) to 1,200tph.

SINGLE OR DOUBLE BOOM

The distinctive attribute of a vacuum ship unloader is the number of unloading nozzles and conveying pipes. Usually, there are one or two pipes, with each arranged on a boom — there are therefore single- or double-boom unloaders.

A single-boom design has its advantages; it requires a minimum amount of equipment and a lighter steel structure, due to one single point for the introduction of power. The less equipment that is required, the lower amount of maintenance is needed — therefore the maintenance costs for a single-boom

design are lower than those for a double-boom design.

The double-boom design is more flexible, and unloading can be carried out from two separate hatches. Another big



Coperion single-boom vacuum ship unloader.

advantage is the high availability of the system, due to the fact that unloading can continue with one boom if there is a technical fault with the other one. Also, the resting process is faster with a double-boom design and reduces the berthing costs of the ship.

CONVEYING LINE

The conveying line of the vacuum ship unloader has various special pieces of equipment, which are described below.

To ensure the smooth conveying of the cargo, it is necessary to adjust the product fluidization and the conveying air at the product pick-up point. Coperion has designed a special suction nozzle with adjustable setpoints for the false air, i.e. the air that will be aspirated in addition to the mixture of bulk material and air at the nozzle inlet. This leads to an optimized, stable and safe aspiration process at the nozzle inlet, resulting in a stable and reliable pneumatic conveying process in the pipe.

The telescopic vertical suction pipe is needed to reduce the lifting height during the lifting of the boom and to adapt the pipe length to the tide height of the ship.

After the vertical suction pipe, the 90° bend is needed to guide the product flow. On this 90° bend, the product flow impacts directly and wears the lining of the bend. To ensure a long life, these bends are lined with basalt or ceramic. Another important feature after the 90° bend is a pipe extension with the same lining like the 90° bend to reduce the wear of the first part



Coperion rotary belt discharger without cover.

of the horizontal suction pipe where the product stream is still a strand on the pipe top.

The horizontal pipe can be either fixed or telescopic. Whereas the fixed pipe has lower and maintenance investment costs, the movable pipe is more flexible to position the vertical suction pipe in the hatch. Without a telescopic device at the horizontal pipe, often the entire ship unloader has to be moved to place the suction nozzle in the desired position.

A highly efficient pre-separation of the bulk material from the conveying air is necessary in order to protect the filter bags of

>compounding & extrusion >materials handling >service

>>Why we enjoy an unloading challenge. Because time is money and this is also very true when it comes to alumina and petcoke unloading. With our Vacuum Ship Unloader VSU, featuring leading-edge technology and our deep process know-how, we can guarantee short ship lay times and ensure gentle and reliable unloading of your product. That's what we mean when we say „confidence through partnership“ . >>www.coperion.com



- > For unloading capacities up to 1.000 t/hr
- > Double or single boom technology

the vacuum filter, and to extend the lifetime of the latter. Therefore Coperion has designed a filter with a pre-separation of bulk material and air. As a result, Coperion can optionally use filter cartridges instead of filter bags, with the result that the filter housing can be downsized. The Coperion filter specialists are continuously working to improve the performance of the filter and to give its customers state-of-the-art technology or to update the existing filters.

Coperion has two different systems for the airlock beneath the filter. Both airlocks are based on the rotary valve design, which assures continuous discharge. The first air lock system is the Coperion rotary belt discharger. This solution is a well proven and economically interesting technology.

The second solution is the Coperion ceramic-lined rotary valve. This solution has a very long life, and helps keep maintenance costs low.

For discharging the product from the rotary valve to the jetty conveyor Coperion offers different solutions depending on the bulk material. These solutions are:

- ❖ Coperion Duroslide (air gravity conveyor), only for alumina
- ❖ belt conveyor
- ❖ through chain conveyor

To generate the vacuum in the conveying system, Coperion uses its own rotary piston blower or a fan. Each of the two principles has its advantages in different application sizes.

Two-stage fans will normally be used in vacuum ship unloaders with high capacities (>300tph) in one conveying line. Fans have the advantage of low investment costs.

Below a conveying capacity of 300tph, the rotary piston blower has proven to be the best technical and economical solution.

STEEL STRUCTURE

Beside the process equipment in the pneumatic conveying line, there are different mechanical aspects that make a Coperion vacuum ship unloader unique.

The slewing mechanism for the boom can be located directly below the booms, so only the boom slews. Another solution is to locate the slewing mechanism under the filter housing; that means the entire upper part of the unloader — including all



Ceramic rotary valve in a vacuum ship unloader.

equipment like filter, rotary valve and the rotary piston blower/fan — move with the boom.

Only with the choice of the best steel structure concept and the application of modern FEM design techniques can the most convenient solution for the steel structure be provided.

MODERNIZATION, REFURBISHMENT

Beside new vacuum ship unloaders, Coperion is also carrying out engineering studies and revamping projects of vacuum ship unloaders, for example on the following items:

- ❖ exchange of the bogies;
- ❖ boom exchange;
- ❖ filter refurbishment;
- ❖ exchange of the control system; and
- ❖ throughput increase.

SUMMARY

Before designing and installing a new ship unloader, many different parameters have to be considered. These range from the environmental data (temperature, wind forces, earthquake forces) to the individual requirements of the customer

(maximum loads on the jetty, unloading capacity, resting process). As shown above, there are many technical solutions available for each part of the pneumatic unloading process, for the supporting steel structure and for the motion of the ship unloader. Only with the specialized expertise from an experienced company such as Coperion, which has access to the whole range of technologies for each part of the process, is it possible to design the optimum technical and economical solution that fulfils the project and customer specific requirements.

DCi



Coperion rotary piston blower.

DSH Systems



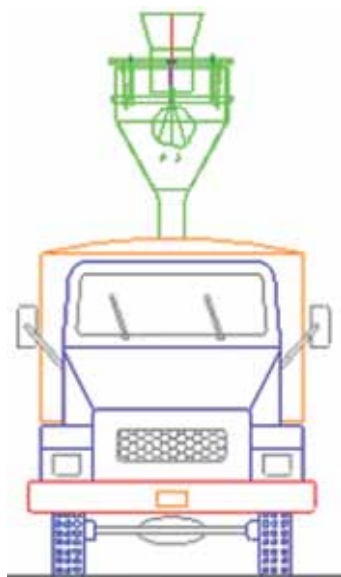
award-winning loading spouts

DSH Systems produces award-winning loading spouts which ingeniously contain the dust within the product stream when discharging dry bulk materials.

The DSH System cleverly avoids the need for the more complicated systems currently used in applications.

HOW DOES THE DSH SYSTEM WORK?

The DSH (Dust Suppression Hopper) System is installed under a feed point where it can be suspended above the target and kept at operating level. A small degree of natural agitation as the hopper is filled helps exclude air from the material being transferred. At



the point of loading, or transferral, the DSH system concentrates the discharge of dry goods as a solid column through free air into any target repository including trucks, rail cars, barge, stock piles, storage containers or bags.

The standard models require no utilities and have no internal moving parts while the PFC (Programmable Feed Control) system automatically configures the hopper for variable product weights.

The DSH System is designed for dry, granular (or gritty), free-running products.

Due to international customer demand, DSH Systems Ltd is constantly researching and developing its system to enable the efficient transfer of a wider range of products.





Previously, trucks taking on a load literally disappeared in the dust cloud. Uncomplicated to install and easy to operate and maintain, the DSH System reduces hazards, health risks, dust and wastage.

DSH SYSTEM CONSTRUCTION MATERIALS

Customers can specify the construction material of each DSH system to suit their requirements, which could be any of the following but not limited to this list:

- ❖ Polyethylene rotational moulded hoppers to cover most applications,
- ❖ Steel and 304 stainless steel hoppers for warm or abrasive products and
- ❖ 316 Stainless steel hoppers for food grade and corrosive situations
- ❖ Steel examples are Corten, Hardox etc.

DSH SYSTEM APPLICATIONS

The DSH System hoppers are used to reduce dust while transferring dry, granular, free flowing products. The hoppers are used for bulk loading fertilizers, stock foods, meals and pellets, wheat, barley, sugars, some limes, salt, sand and gravel.

DSH System is used under a central feed point while bulk loading into any target repository including trucks, rail cars, storage containers, bags, stock piles, ships or barges.

ENGINEERED SOLUTIONS

DSH Systems will analyse clients' existing loading facilities and will provide the best dust reduction solution for the specific situation. Site specific engineering may be required to suit the customer's requirements. To date customization has included features such as steel or fabric filter covers, dust socks (with or without covers), custom-made springs and frames.

DSH SYSTEM MODELS

DSH Systems produces two models that can be any size or construction material:

- ❖ The standard model requires no utilities and has no internal moving parts.
- ❖ The PFC model (Positional Feed Control) has a computerized discharge rate control system for products with different specific gravities; thus allowing the load-out of various materials on the same conveyor system. All DSH System models can be configured for PFC configuration.

DSH SYSTEMS – WE CARE ABOUT YOUR AIR!

Solve the world-wide industrial material handling problem – dust fallout while transferring dry, granular goods.

At the loading point, the DSH System concentrates the discharge of dry goods as a solid column through free air into any target repository including trucks, rail wagons, storage containers, ships and barges, bags or stockpiles.

The standard DSH Dust Suppression System uses no utilities and has no internal moving parts. PFC (computer controlled) model available.

Winner (joint) of the Inaugural Innovative Technology Award at BulkEx 2006. Winner of the Dust Control Technology "Application or Practice" at BulkEx 2007.

The DSH System gives you:

- Cleaner, safer working environments
- Dust explosion risk mitigation
- Reduced maintenance, cleaning and dust handling
- Faster, continuous, cleaner loading
- Enables operation in closer proximity to urban areas
- Reduced product shrinkage.
- Reduced environmental agency concerns

Clients include companies handling fertilizers, grains, stock-foods, salt, sugar, sand, etc in Australasia, USA, Canada, South Africa, South America, and France.




ENQUIRIES
DSH SYSTEMS LTD
 E: info@dshsystems.com
 T: +64 (0) 9 828 8012
 W: www.dshsystems.com

Customer trial of DSH (dust suppression hopper) systems vs. existing technology

Trial Location: New South Wales, Australia
Location Type: Port loading facilities
Date of Trial: February 2013

Phase 1

The DSH hopper was installed on Unloader A to be used in the discharge of 28,000 tonnes of soybean meal from a vessel.

Unloader B is also being used in the discharge of the soybean meal but it still has the original truck loading chute — the same chute that was removed from Unloader A.

As soybean meal is a dusty cargo and both A & B are to be used at the same time in the discharge, it was an ideal time to compare the new DSH Systems dustless hopper in operation against the original truck loading chute in the same operation.

At this setting, it took Unloader A approximately 6 minutes to load one truck and there was minor spillage occurring over the top of the hopper — at the same time Unloader B was taking approximately 2 minutes 40 seconds to load a truck.

After lowering the hopper height to increase the spout opening size and adjusting the unloader slide gate that controls the flow rate into the dustless hopper, the truck loading rate was reduced to an acceptable 3 minutes and there were no spillages from the dustless hopper (Unloader A).



Figure 2: Unloader A (DSH Hopper) loading the first truck after adjustments.



Figure 4: Unloader A DSH Hopper in operation loading a truck after further adjustments.



Figure 1: This is the initial height the hopper was installed prior to loading the first truck.



Figure 3: In comparison at approximately the same time, Unloader B loading trucks.



Figure 5: Unloader B truck loading in comparison at approximately the same time.

Phase 2

DSH Systems' dustless hopper has now been used on the discharge of four different cargoes.

- ❖ Soybean meal — 28,000 metric tonnes
- ❖ DAP — 500 metric tonnes
- ❖ MAP — 5,422 metric tonnes
- ❖ MES10 — 2,350 metric tonnes

It has shown to be most effective on the dusty soybean meal cargo with a significant reduction in dust during truck loading and only minimal time difference compared to the truck loading rate using the original truck loading chute.

The truck loading rate of fertilizers MAP, DAP and MES10 showed an increase in time to complete a load compared with the original loading chute.

THE TRUCK LOADING RATE VARIED SIGNIFICANTLY:

	Approx. truck loading rates	Original truck loading rates
Soybean meal	3 min	2 min 30 sec
Dap fertilizer	1 min 30 sec	1 min
MAP fertilizer	3 min	1 min
Mes 10 fertilizer	2 min 30 sec	2 min

The loading rate is controlled by the unloader slide gate positioned directly above the DSH hopper and is set to enable the maximum amount of cargo fed into the DSH hopper without overflowing out of the hopper.

To enable a quicker loading rate the DSH hopper was modified to provide a larger spout opening.

The height of the installed DSH System is perfect to give adequate clearance from the top of the truck trailers.



Figure 6: Soybean meal Unloader A.



Figure 7: DAP Fertilizer Unloader A.

CONCLUSIONS OF TEST

- 1) During Phase 1 only soybean meal was loaded. On first installation, the hopper loading was slower than the traditional chute, but after adjustment loading time was very similar. Significant dust reduction was observed by using the DSH System.
- 2) During Phase 2 further soybean meal was loaded as well as a variety of fertilizer products. Again significant dust reduction was achieved by using the DSH System on all products.

Loading time on soya bean meal was very similar with both systems. Loading time of the fertilizer products was slower with the DSH due to different bulk densities of this product over the soybean meal.

- 3) Based on the significant dust reductions achieved, the DSH hopper on Unloader A was replaced with a modified model and the same unit was also installed on Unloader B. All products are now being loaded at the same speed as the traditional unit, but with massive dust reductions. DCI

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- Henry Ford

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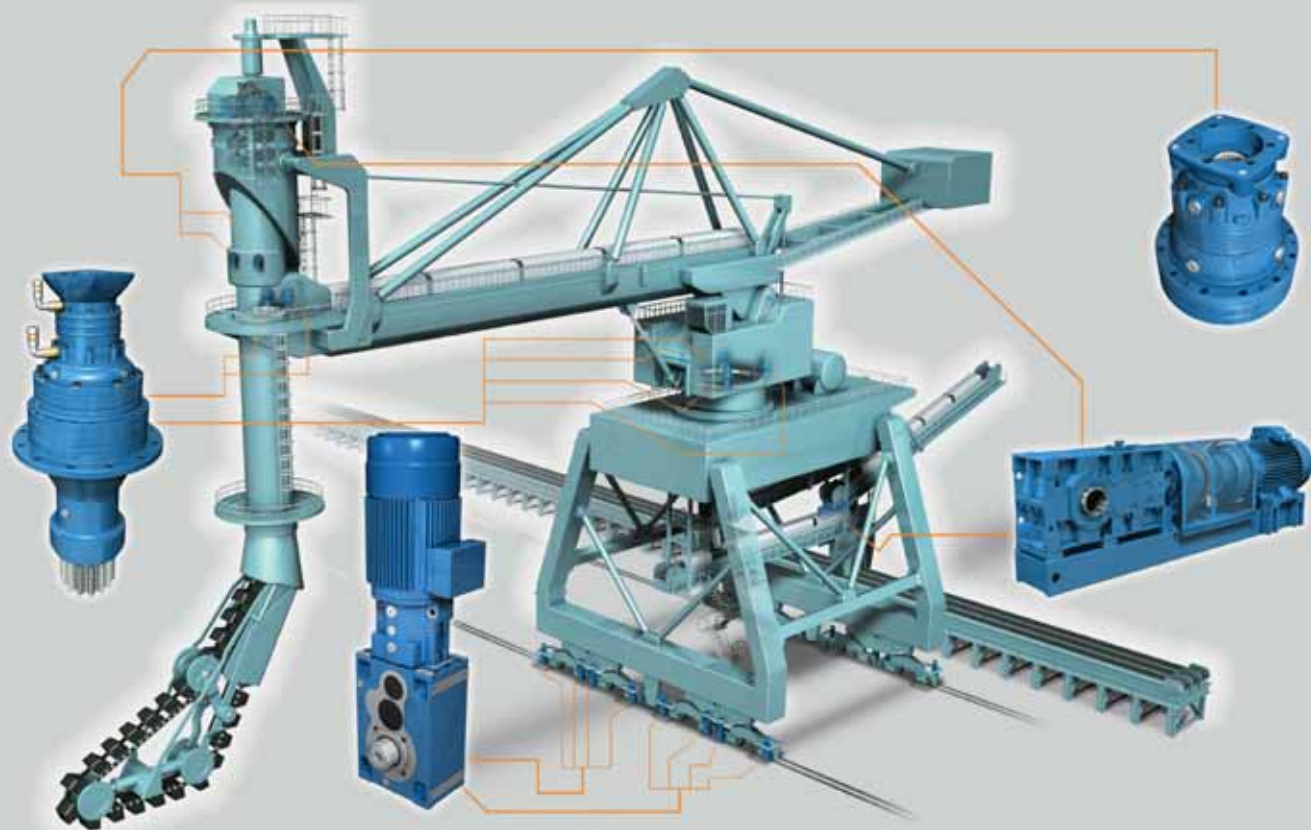


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Drives & controls



Liebherr's latest crane model, type LHM 420.

keeping bulk cargo on the move

Jay Venter

Synchronizing Crane Control System does double-duty with Liebherr cranes

With two state-of-the-art Liebherr mobile harbour cranes, Niedersachsen Ports is embarking on an expansion programme that will increase turnover at its seaports Brake and Emden. The new Liebherr cranes are equipped with new state-of-the-art control systems that not only allow for two cranes to be operated at one, they also ensure collision avoidance and precision, safety and accuracy.

CRANE CONTROL SYSTEMS

Sycratronic®

Sycratronic® (Synchronizing Crane Control System) allows two Liebherr mobile harbour cranes to be operated simultaneously by one crane driver for improved speed, capacity and safety.

Another add-on feature is the Dynamic Anti-Collision System DACS®, controlling the simultaneous operation of crane motions, so ensuring best possible performance and preventing collision between the cranes and/or defined fixed obstacles.

In line with Sycratronic® Liebherr has developed another innovative add-on feature for heavy lifts. The Vertical Line Finder is a control assistance feature which assists the operator in avoiding side pull of the load caused from the long distance between operator and load or asymmetric centres of gravity.

With Sycratronic® activated, heavier lifts are possible as — due to safety regulations — 100% capacity of both cranes can be used instead of just 75% with manual tandem lifts. Additionally, operation is much faster and safer compared with conventional tandem lifts as just one crane operator is needed to control both cranes, eliminating possible communication problems between the operators. Moreover, Sycratronic® makes operation easier as both machines are controlled like a single crane, avoiding overloads.

Litronic®

Litronic® is the central crane control and management system

developed by Liebherr. It guarantees precision, safety and accurate crane operation using the most up-to-date software and hardware.

Modular and open system architecture allows quick implementation of new requirements or changes resulting from practical experience. Compatibility with other systems opens up unlimited application possibilities for diagnosis, operation and process data recording.

NIEDERSACHSEN PORTS ON COURSE FOR EXPANSION

Within a short timeframe, Niedersachsen Ports GmbH & Co. KG (NPorts) in Northern Germany ordered two Liebherr mobile harbour cranes (LHM).

In Brake, NPorts has been successfully using an LHM 500 for years. The company therefore decided to equip the Niedersachsenkai with the popular successor model, type LHM 550. The LHM 550 provides a maximum lifting capacity of 144 tonnes and an outreach of up to 54 metres. At maximum outreach the capacity is 40.9 tonnes.

Due to this second LHM in Brake, NPorts also offers high-capacity tandem lifts to its customers. In this regard, innovative technology from Liebherr plays a major role. Thanks to the installation of Sycratronic®, one crane operator can handle heavy loads of up to 284 tonnes. The new crane has started operation in May 2013. In Brake, NPorts mainly handles project cargo, heavy cargo and components for the wind power industry.

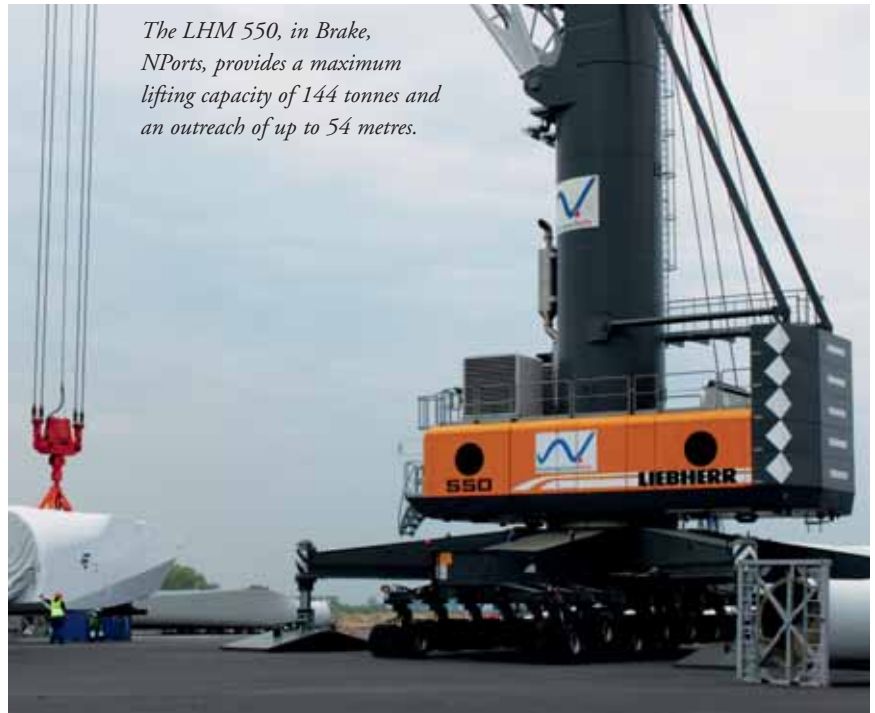
The NPorts branch in Emden was in need of a short delivery time. After the existing cranes had to be shut down at short notice, an alternative was urgently required. Liebherr was in the position to offer a delivery time of just 14 days ex-works for its latest model, type LHM 420. In early April, the new crane was delivered to Emden fully assembled. Only a few days after arrival, the new crane was ready for operation. "Because of the urgent need the procurement of the new mobile harbour crane was quite challenging for all parties involved. We are pleased that everything worked out very smoothly, including the contract negotiations, the challenging unload of the crane at the Südkai, the installation of the LHM 420 and the training of the crane operators in Emden," said Dipl. Ing. Wilfried Schleusener, Project Manager Engineering, impressed by the professional collaboration.

The LHM 420 is equipped with two double winches and provides a maximum lifting capacity of 124 tonnes as well as a maximum outreach of 48 metres. At maximum outreach the capacity is 34.5 tonnes. Main tasks of the new machine include grab operation (SWL 75 tonnes), project cargo and breakbulk.

Both Liebherr mobile harbour cranes in Lower Saxony's Emden and Brake are equipped with a powerful 670kW diesel engine. Thanks to innovative eco-technology the fuel consumption is between 25 and 35 litres per operating hour (depending on application).

Niedersachsen Ports

Niedersachsen Ports GmbH & Co. KG is owner and operator of five seaports, seven island supply ports and three regional ports on the German North Sea Coast. The company's head office is in Oldenburg. Niedersachsen Ports manages the port infrastructure



The LHM 550, in Brake, NPorts, provides a maximum lifting capacity of 144 tonnes and an outreach of up to 54 metres.

of the large seaports in Lower Saxony via its branches in Brake, Emden, Cuxhaven and Wilhelmshaven. The Norden branch is in charge of the island supply ports for the East Frisian Islands. Hence NPorts is the single contact for several German ports. On the one hand, the ports of Nports are the foundation for manifold economic activities; on the other hand they connect the sea- and land-based transport. For that reason they represent essential links in the international supply chain.

Liebherr

The Liebherr Group comprises more than 130 companies in every continent of the world and employs a workforce of about 38,000 people. In the past few years the Liebherr Group has undergone dynamic development and in 2012, achieved a total consolidated turnover of €9.1 billion.

The Liebherr Group's holding company is Liebherr-International AG in Bulle, Switzerland, which is entirely owned by members of the Liebherr family. The family business is currently being managed in the second generation by Dr. h.c. Isolde Liebherr and her brother Dr. h.c. Willi Liebherr. Sophie Albrecht, Jan Liebherr, Patricia Rüb and Stéfanie Wohlfarth have been actively involved in the management of individual divisions as representatives of the third generation since 2012 in order to help set the company's course for the future.

The Liebherr-MCCtec GmbH, Nenzing (Austria) is one out of nine divisional control companies and co-ordinates all activities in the field of maritime cranes. The product range includes solutions for any kind of cargo handling in ports as well as in the shipping and offshore industry such as mobile harbour cranes, gantry cranes, ship cranes, offshore cranes and reachstackers. On the international building machinery market the division is offering a broad range of universal duty cycle crawler cranes, lift cranes as well as foundation equipment.

The Liebherr-MCCtec GmbH currently employs more than 3,500 employees worldwide and has four state-of-the-art production sites for maritime cranes in Killarney (Ireland), Nenzing (Austria), Sunderland (Great Britain) and Rostock (Germany). In addition, the maritime division operates 37 sales and service organizations.

Demag process cranes for automated store management



— Cement industry relies on robust crane technology

— Permanent use in 24/7 operation

— Scanner use and transparent store management

Terex Material Handling is further extending its position as supplier of automated storage systems for the cement industry: the company is equipping two stores with Demag process cranes and storage controllers. After commissioning, planned for the first quarter of 2014, the two crane stores in Colombia and Mongolia will run fully automatically in 24/7 operation.

Lutz Dowy, vice president of sales and product management at Terex Material Handling says: "With our automated crane installations, we offer complete solutions for storage area management in the cement industry. Our customers benefit from robust crane technology that, with the highest availability, places the materials into storage and safeguards the production processes."

On behalf of FL Smidth A/S, one of the world's leading suppliers of machines and systems for the cement industry, Terex Material Handling is supplying two Demag process cranes for the new construction of an additives store in Mongolia. The two identical crane installations, with a span of 15.5m, travel on a crane runway of approximately 78m in length. Equipped with a 4m³ powered clam-shell grab, the Demag process cranes place the base materials clay, iron ore, sand and gypsum into storage, sorted correctly by type. With the store management system also included in the scope of delivery, the operator will be able to use the cranes independently around the clock.

Following the modernization of a clinker store in its plant in Toluviéjo, Colombia, the manufacturer Cementos Argos S.A. will use Demag process crane technology. The crane installation ensures the placement into storage, transport,

mixing and timely provision of various clinker and additives. The installed and completely automated crane installation with 14t load capacity and 30m span also features scanner technology. A scanner installed on the crane bridge records the filling height of the materials in the storage area of approximately 2,900m² every time the crane travels. From this data the store management computer creates a height profile and steers the grab of the crane exactly over the transfer points in a time-saving manner. The fill levels are also permanently measured using scanner technology and transparent store management is ensured.

ABOUT TEREX MATERIAL HANDLING

Terex Corporation is a worldwide supplier of crane technology with Demag industrial cranes and crane components. The core competence of the Terex Material Handling business group lies in the development, design and production of technically sophisticated cranes, hoists and components and the provision of sales and services for these products. The business group manufactures in 16 countries on five continents and is present in more than 60 countries, reaching customers in more than 100 countries.

Terex Corporation is a diversified global manufacturer of a broad range of equipment. A core activity of Terex Corporation is the provision of reliable, customer-driven solutions for many applications, including the construction, infrastructure, shipping, transport, quarrying, mining, refining, energy, utility and manufacturing industries. Terex reports in five business segments: Aerial Work Platforms; Construction; Cranes; Material Handling & Port Solutions; and Materials Processing Terex Financial Services offers a wide range of products and services to assist in the acquisition of Terex equipment.

Ease of maintenance, safer operations – all by sensor optimization



SIBRE Siegerland Bremsen GmbH is a medium-sized company that operates worldwide, writes *Lutz Kramaschki, of SIBRE – Siegerland Bremsen GmbH*. It has over 50 years of experience and, from the very beginning, has been involved in the development and production of industrial brake systems and drive components. Its customers are consultants, OEMs (original equipment manufacturers) and operators in heavy duty industries such as — but not limited to — ports, steel mills, mining and regenerative energies.

Right from the start, value was placed on technical innovation, the most modern manufacturing technology and high customer use. Production procedures are continuously supervised by a quality management system ISO 9001. The aim of the product development is an optimum combination of a top-quality product, the easiest use and market-driven price both for plant engineers and plant operators.

Brakes and drive components are developed by a team of highly qualified engineers, technicians and designers and are adapted to increasingly complex and powerful drives. With SIBRE, customers rely not only on decades of experience in brake production, but also on the most modern construction and manufacturing technologies. SIBRE works with modern, efficient construction 3D-software for the design layout of brakes and has its own high-quality testing and measuring lab.

The company as a system supplier has a worldwide presence, and runs branches in China, India, Spain, Italy and in USA.

In addition to new product development, among other things SIBRE has, in recent years, been focused on the optimization not only of mechanical systems, but also the sensors.

The SIBRE IBC-control system for belt conveyors is ideally suited to ensure essential safety functions and control of brake cascades. For instance, well-defined brake cascades can be

installed at transfer stations of independent belt conveyor systems to avoid piling of transported material during emergency stops and clamping. According to requirements, linear, progressive or degressive deceleration curves can be defined with the IBC-control system.

Soft braking in the braking operation prevents tension stress peaks in the conveyor belt. Identical deceleration curves and braking times can be achieved even under varying load conditions and even with different brake systems in the plant.

IBC-control systems for electro-hydraulic drum and disc brakes consist of a programmable frequency inverter with function modules (software) and an input unit (pedal, internal or external parametrization interface, process control module with measuring sensor). A frequency change will be generated at the output of the frequency inverter. This frequency change is used for the activation of an electro-hydraulic thruster so that its hydraulic force can be varied. The resultant actuating force of the electro-hydraulic thruster is effective opposite to the braking force of the braking system so that this relation forms the basis for the control of the braking operation.

IBC-control systems are qualified for subsequent installation and therefore are predestined for the modernization of machines and drive systems. They are inexpensive and provide flexible use through a wide range of permitted input voltages. Of course, all SIBRE products designed for open-cast mining conform to all provisions of dust ignition proof.

The topic of sensor optimization also covers the development of monitoring systems for brakes. The status monitoring system SMS for the SIBRE USB, TEXU and SHI brakes uses monitoring switches, contacts, temperature sensors and strain-gage technology to permanently read the actual status of the brake. These permanently available status messages on conditions of the



Bulk handling ports are major users of SIBRE control systems.

brake systems reduce the maintenance costs, optimize maintenance planning, increase process reliability and machine uptime and diminish the danger of unscheduled machine breakdown.

To be among the above-mentioned new product developments, the ABC-V drum coupling optimally is in line with the distribution channel and the one-stop-supplier-strategy of SIBRE. The drum coupling is completely produced in the German headquarters.

In 2010, the ABC-V was introduced to the market with compatible fitting sizes especially designed for the transfer of medium and high torques in crane hoisting gear, conveyance, stackers, ship unloaders, container cranes as well as in heavy, rough smelting works. Torques of up to 1,025kNm and radial

loads of up to 550kN can be transferred with a maximum coupling diameter of 1,025mm which provides a high overload safety.

High-quality coated forged steel guarantee durability, wear resistance and high material strength. Together with the arched drum roll (hardened rolling bearing steel) it is possible for the hub to oscillate relative to the housing. This allows for a compensation of angular displacement up to $\pm 1^\circ$ and an axial shifting from $\pm 4\text{mm}$ up to $\pm 10\text{mm}$.

SIBRE considers it essential to look at the life cycle costs: over the life span of drive components; maintenance can be higher than the initial purchasing costs. This is why SIBRE pays particularly close attention to designing and manufacturing lasting products that require the lowest possible maintenance and that are easy to maintain.

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Smart load SENSOR by Sensor Technology

A smart load sensor developed in the UK by Sensor Technology provides all the information needed to optimize efficiency and increase profitability of a wide range of industrial operations.

A new development, which was launched at the Hannover Messe exhibition which took place in April, allows weighing processes to be fully integrated with handling operations. All live data is captured in real time and can be transferred to a database, stored, totalized and analysed.

For instance, you may need to know how much material you have transported, or you could be handling two or more materials simultaneously which need to be accounted individually; or if working for multiple customers at the same time you can bill each appropriately.

The development, called LoadSense, is an intelligent load sensor that can be integrated with a crane hook, fork lift or other handling device. It has an on-board single-chip computer for recording, analysing and archiving readings, and wireless communications capability which can transfer data in real time to a host computer.



A smart load sensor developed in the UK by Sensor Technology provides all the information needed to optimize efficiency and increase profitability of a wide range of industrial operations.

Designed and manufactured by Banbury-based Sensor Technology, internal batteries make LoadSense's operation completely autonomous. As such it can be deployed with minimal disruption to operations, and will automatically begin transmitting data. No special training is required to install or operate the unit.

LoadSense is built around an intelligent load sensor, a hand-held display and a receiver. The load sensor is based on proven strain gauge technology, and is calibrated as standard in the range 1–25 tonnes, with other ranges available on request.

The transmitter (operating on an unrestricted 2.4GHz waveband), enables accurate load data to be sent to the display, a full colour, TFT touchscreen computer, running the familiar Windows XP and LabVIEW. The display provides real-time measure of the load, while the computer records and processes real-time values.

Sensor Technology's Tony Ingham explains: "Our main markets are materials handling and warehouse operations, where the intelligence will convert raw data into instant stock counts. We have already had enquiries about raising nuclear fuels rods, monitoring window cleaners' cradles on high-rise buildings and winching and weighing building materials."

Theatre stage hands could lift and lower scenery from the wings rather than from a remote control room. Using LoadSense with a tractor-mounted winch, you could assess roadside trees' susceptibility to wind speed. For applications involving liquid discharge, a system could be configured to monitor and control flow."

LoadSense could be wirelessly integrated into a SCADA or Manufacturing Enterprise Systems control system, producing instant operating reports and e-mailable customer bills. It also improves operating safety because operators are free to remove themselves from dangerous locations.

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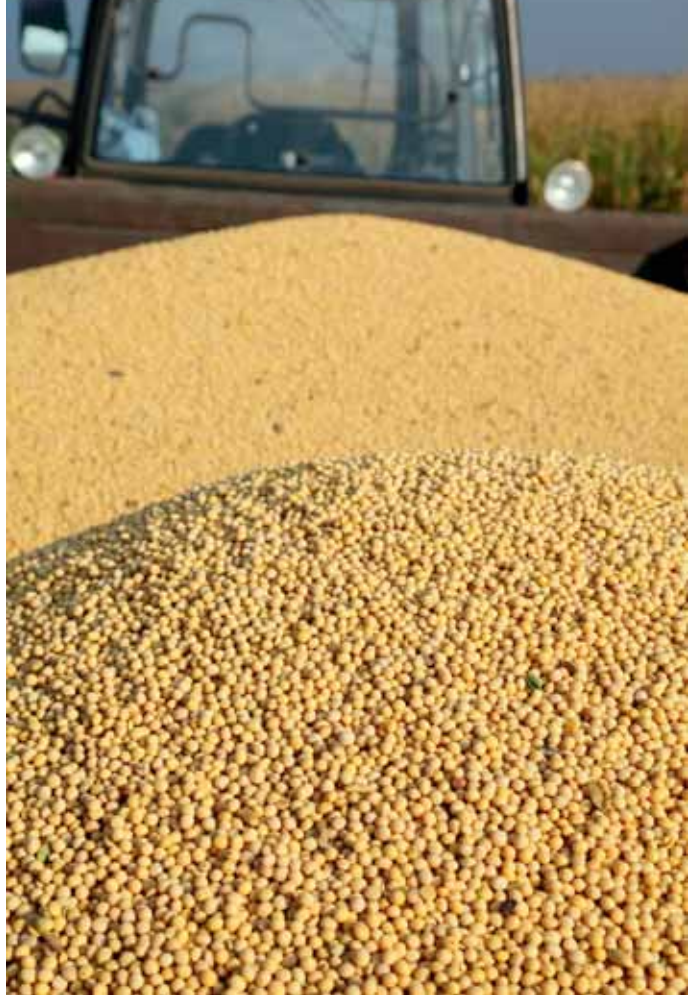
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igus® GmbH
Spicher Str. 1a

D-51147 Cologne
cranes@igus.com

phone +49-2203-9649-0
fax +49-2203-9649-222

Bulk knowledge: soybean meal handling



Over the past two decades, global production of soybean has more than doubled. Both supply and demand factors have dramatically increased the area of agricultural land utilized for the production of the oilseed grain; the American Soybean Association estimates that around 83.2mt (million metric tonnes) were produced globally in 2011, amounting to 56% of world oilseed production. While production levels have increased across many markets, there remain significant asymmetries between supply and demand for soybean products, with production mostly concentrated in North and South America, but demand concentrated, and growing fastest, in China and the world's developing economies. This necessarily means that large quantities of soybean, in multiple forms, pass through bulk ports around the world. Buttimer Bulk Engineering has designed a number of port and logistics facilities with mechanical handling systems for soybean meal, through which the company has built up significant knowledge of the principals and pragmatics of handling a unique, and sometimes difficult, bulk product.

The soybean crop is a legume; part of the reason for its remarkable growth in demand is due to its very high protein content and range of amino acids. About 85% of soybean crop produced will be crushed to produce edible oil and soybean meal, with the remainder used in its bean form as seeds, and food, primarily in China. The edible oil is used in a variety of food production contexts, adding protein or used as an emulsifier; it is also — and increasingly — being used in the production of biodiesel and ethanol. Soybean meal, the other by-product of the crushing process, is used in animal feeds. Changes in consumption and agricultural practices in China and the developing world — resulting in a large increase in beef production — are some of the main drivers of the growth in demand for soybean meal exported from North America, Brazil, Argentina and Paraguay, to Eastern Europe and Asia. In terms of

the financial value of soybean products traded internationally, it is estimated that 50% is in the raw bean form, another 34% is soybean meal with the remainder being edible oil and a very small amount of finished soya products, such as tofu. International trade is further classified into GM (genetically modified) and non-GM soybean crops. A significant portion of the increase in global yield of soybean grains has been due to widespread use of pesticide resistant genetically modified crop varieties; these however are not accepted in some markets, notably the EU, and so further speciality and 'organic' varieties are produced and traded for specific markets.

HANDLING SOYBEAN MEAL

At Buttimer, the continued growth of bulk trade in soybean products has been seen as an opportunity to demonstrate strong port design and process engineering capability: understanding the behaviour of the bulk product and designing appropriate and efficient mechanical handling systems to manage its characteristics. In its unprocessed bean form, soya is relatively free flowing and can be handled like other loose bulk products such as maize (corn), or other grains, provided that the system includes no high drops of the product, keeping splitting and breakage of the seeds to a bare minimum. Like most grains, monitoring temperature and moisture levels to identify mould damage or insect activity should help maximize storage life and pre-empt deterioration. The handling of the soybean meal however is an altogether trickier, stickier problem; it is a poor-flowing bulk product and a mildly abrasive one, so the handling of soybean meal requires tailored process engineering with a strong focus on the safety of dust levels and the optimization of equipment lifecycles.

“The first and most important difference between designing handling systems for soybean meal and for other grains, is the level of dust, and the flammability of the dust, that you have to



expect,” explains Mateusz Olejniczak, an engineer and project manager who has been responsible for a number of Buttimer’s soybean handling projects at ports and other facilities “while dust control is always important in grain handling systems, dust from soybean meal is particularly flammable, and there’s lots of it!” Buttimer assigns ATEX fire safety codes both internal and external to all relevant equipment, including investigation of the ignition point. It fits equipment with special spark prevention features such as plastic casings on bucket elevators, anti-static rubber on drums, rollers and other high friction points, as well as using anti-static belts on all conveying equipment. Anti-explosion precautions are essential design features of soybean handling plants, both for the protection and longevity of the mechanical handling equipment and the safety of any onsite staff. Assigning ATEX ratings, predicting dust levels in and around equipment, identifying transfer points and potential fire hazards are integral to Buttimer’s process engineering design, when dealing with a product like soybean meal the system needs to be tailored to the product’s characteristics, ‘off-the-shelf’ handling solutions will be ineffective and often unsafe.

Soybean meal has an average density of 0.6 n/m^3 , substantially less than regular grain products which are around 0.75 Tn/m^3 . It also has higher moisture and oil content and is less free-flowing than most grain products, requiring higher angles of conveyors and chutes to optimize flow. Free-flowing grains will usually travel easily at an angle of 40° to 45° , whereas soybean meal needs a slope of minimum 55° to ensure flow. The product’s poor flow, its ‘stickiness’ and tendency for compaction have a number of consequences for the layout and design of the handling system; for example, measures need to be taken to prevent the build-up of product at transfer points or in gaps



along the process. Olejniczak describes the “need to prevent ‘dead-zones’ in your system — where some the product stops moving for a period of time.” Soybean meal that is left sitting for a number of hours is highly susceptible to problems like salmonella, he describes how Buttimer eliminate ‘dead-zones’, for example by inserting curved plates at the end of conveyors to prevent any build-up of product, and by carefully designing transfer points in the system to ensure efficient throughput, without areas where it can become lodged and collect.

SOLVING STICKY STORAGE

Storage of soybean meal can also present difficulties. The product has a tendency to compact and solidify when left motionless for an extended period of time, for example in a silo. “Even after a few days or a week it can go like a rock!” explains Olejniczak. For this reason, extra thought must be put into storage facilities, maintenance and product handling, even when

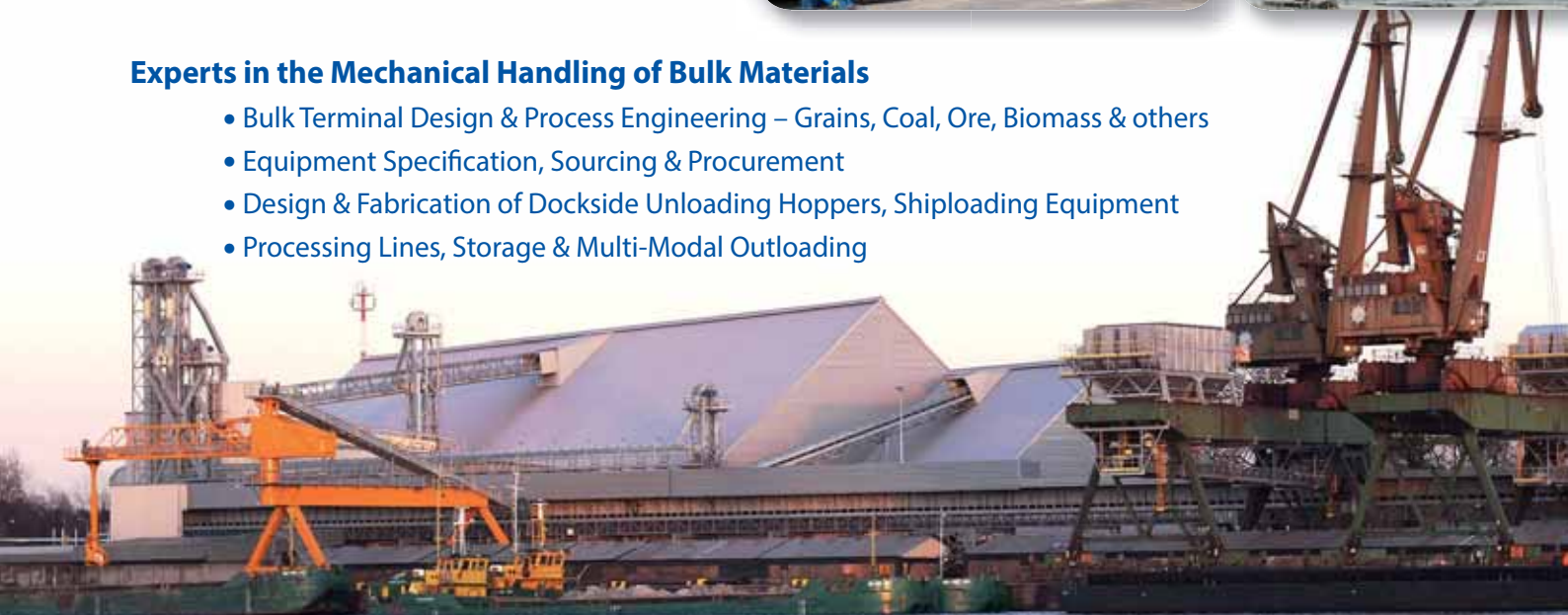


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its not required for processing or transfer. While Buttimer can design and install both silos and flat storage facilities for soybean meal, the preference is usually for flat storage solutions, where it's easier to unload and, store and out-load the product, as it can be handled with a front-end-loader rather than relying on gravity to discharge a silo where the product is prone to bridging and compaction. Where a client has a preference for silos, a system for routinely transferring the product between silos needs to be implemented, with careful operation of HydroScrew discharge systems fitted with load sensors, discharging from the whole cross-section of the bin, maximizing the force of gravity towards



the discharge, and taken mechanically out through the opening — if the product becomes compacted above the bin's discharge screw it is almost impossible to get it out!

The lower density of soybean meal compared to other grains, as well as its 'stickiness', usually mean that soybean meal handling facilities have a lower throughput capacity for similar design, than a wheat, barley or rice facility would; therefore where a very high tonnage throughput per hour is necessary, higher capacity equipment and higher energy usage will likely be incorporated into the process design. Buttimer often recommends that its clients operate conveyors, chain conveyors and bucket elevators at as low a speed as feasible when handling soybean meal, as it is a relatively abrasive grain product there is a significant amount of wear and tear on equipment and the handling system, especially when processing at high speeds.

Buttimer has also developed the capability to load product to trucks and train wagons, often incorporating special dust-free outloading stations with aspiration bellows. Each intermodal port or inland terminal will have different logistics arrangements and outloading schedules, Buttimer's process design integrates the material handling system with the broader logistics infrastructure and requirements.

In order to maximize the clients' return on the capital investment in a handling and storage facility, equipment lifecycle management, a well-designed and adhered to maintenance programme and well trained, informed operators are crucial, Buttimer insists. "If the first step to designing a bulk material handling system is understanding the characteristics of the bulk product," proposes the Group's director, Fergal Buttimer, "then the next step is understanding the business requirements of our client." Buttimer focuses on keeping the 'Total Cost of Ownership (TCO)' matrix low by building sustainable handling systems, ensuring that its mechanical systems are designed to be durable, efficient and ultimately, meet the clients' long-term requirements. Incorporating equipment lifecycle optimization into the design and installation phase can save significant amounts of stress, maintenance and repair expenditure after the system has begun operating; for this reason, Buttimer is always keen to work with the final operator from early in the design process.



Equipment lifecycle management includes a knowledgeably designed and stocked spare parts store, with appropriate motors and gear replacement parts — the goal is to keep the parts store small, but reaction times very quick.

BUILDING ON BULK KNOWLEDGE

Buttimer has completed a number of large soybean meal handling facilities, building up experience and expertise in what they see as a potentially high-growth area of their business. A large project at the port of Swinoujscie in northern Poland has a handling and



storage capacity for 50,000 tonnes of soybean meal, with ship unloading at a rate of 800tph (tonnes per hour) and out-loading capability to ship, trucks and rail transport networks. The facility was designed for Bunge, one of the world's largest traders in oilseeds and edible oils, and was completed in 2012. The facility, which is engineered using specialist grain handling equipment manufactured by Cimbria, includes many of the process engineering features specific to soybean meal described above; it also has rapeseed cake handling capabilities, another component of Buttimer's bulk knowledge. This summer Buttimer has begun designing a port facility for Morski Terminal Masowy Gdynia (MTMG) — part of the large, French ATIC logistics group. The soybean meal handling facility at the Port of Gdynia will unload Panamax-size vessels at a rate of 1,200tph and include a large flat storage facility with transport throughout the store via belt conveyors, chain conveyors, bucket elevators and pneumatic slides.

With the growth in production of biodiesel from soy in the US and elsewhere, and steady growth in demand for soybean meal in Eastern markets, soybean and its derivative products look set to be a significant portion of bulk cargo trade for the foreseeable future. Buttimer has built up expertise and experience in handling soybean meal in much the same way as it has with other products such as rice, wheat, barley, ores, minerals, coal, wood-chip and others. The potential growth in the oilseeds market, and global trade in soybean meal in particular, Buttimer hopes, will put its consultancy, design and project management skills in demand, and can give it a competitive advantage and open new opportunities in international markets. DCi

JEM International: experienced bagging specialist

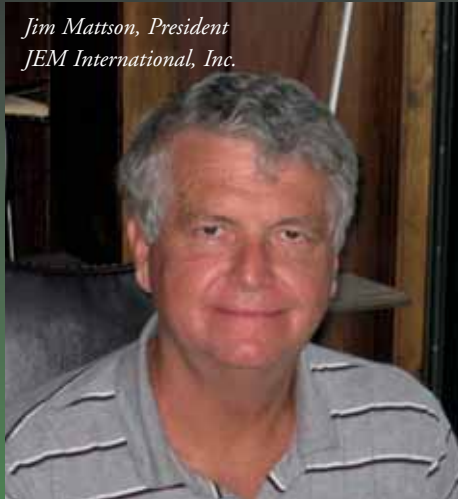
JEM International, Inc. has supplied self-contained portable bagging systems for over 30 years. The majority of the systems have been used for handling grain, rice, and fertilizer bagging 50kg and 25kg open mouth bags. Other models are available for handling FIBC bags (one-tonne super sacks).

The design is based on two separate bag filling lines. Each line consists of a surge hopper to receive product via ship grabs, 80 gallon air compressor, digitally programmed controller, duplex net weigh bagging scale, bag closing system, bag closing conveyor, and additional transfer conveyors for loading bags directly onto trucks.

Each line is capable of 20 bags per minute, therefore a total of 40 bags per minute is obtainable with a single bag plant. This totals to 50 metric tonnes per hour for each line, or 100 metric tonnes per hour for a bag plant (based on 50kg bags).

The scales are CM780 duplex net weigh scales with tool-less entry and quick change components. For bag closing JEM

*Jim Mattson, President
JEM International, Inc.*



uses industrial sewing heads from Union Special, Newlong Industrial, and Fischbein. All sewing heads are plate-mounted so that changeover to a spare sewing head can be accomplished in minutes. The original can then be repaired in a shop and not on-line thereby eliminating costly downtime. All of JEM International's equipment is heavy duty, durable, and can withstand harsh environments.

The company's bag plants are designed to operate off of shore power, ship power, or it can offer a generator to supply power as well. Once connected, the system is easy to operate. JEM's systems come in

three separate parts. One 5' (1.524m) x 20' (6.096m) surge hopper section; one 8.5' (2.59m) x 20' (6.096m) scale section; and one 8.5' (2.59m) x 20' (6.096m) conveyor and bag closing section. All three sections are assembled using Tandemloc corner locks for easy installation and disassembly for placement back into storage. Doors are supplied with inside bolts or padlocks to provide security when not in use, and internal lights for 24-hour operations.

Mondi and Baunit win Emballissimo award

Mondi's Sheekan Bag, an industrial bag with not only a full moisture barrier but also the Easy Seal sealable valve, has won this year's Emballissimo award in the 'Containment' category.

This bag solution, which was optimized in collaboration with Baunit Wopfinger, utilizes two innovative ideas which in combination provide the filled contents with outstanding moisture protection without compromising filling speeds.

The Sheekan Bag with Easy Seal, which was tailored to the customer's specifications, was developed jointly with building materials producer Baunit Wopfinger and entered for the Emballissimo. The Emballissimo is awarded for packaging with outstanding innovative functionality. The Sheekan Bag features a specially modified PE film in combination with an applied adhesive strip. With this system, air required during the filling process can escape quickly, and the filled bag has an all-round protection against moisture. The reliably sealable Easy Seal valve provides additional protection.

"Building materials have to be stored dry, otherwise they react with moisture prior to use," points out Baunit Wopfinger head of purchasing Gunter Handler. "We want to offer our customers long storage times, so we went in search of a solution which would provide our building materials with optimum protection and would also function well during the production process," he says.

"The Sheekan Bag meets two of our customer's requirements: product protection and high filling speed," says Mondi Bag Austria sales manager Ferdinand Muck. "That's two birds with one stone," he adds.

Emballissimo awards for innovative packaging solutions are conferred annually by the Association of the Austrian Paper Industry. The awards ceremony was held on 18 June 2013. Over the past decade, Emballissimos have been granted to Mondi's industrial bags on six previous occasions, reflecting Mondi's emphasis on innovation.

Aussie steel industry welcomes anti-dumping measures

The Australian steel industry says a new anti-dumping agency could prevent the sector from losing hundreds of millions of dollars.

The Federal Government has launched an Anti-Dumping Commission to help deal with the spike in complaints about imported goods being sold in Australia at below cost price.

The food, steel, aluminium and timber industries say

dumping is undercutting local industry. Ian Cairns, from the Australian Steel Institute, says the new commission needs to address that problem. "Well, it's cheating I guess, in the one word. It's really cheating against your fellow competitor. "Hundreds of millions of dollars if you put it through the whole industry, certainly the Australian steel supply chain and all the other industries that go with it."

Pulp fiction?



getting the facts on the pulp and paper market

Patrick Knight

Several new pulp mills will start up Brazil in the next few months. But excess supply may cause prices to fall, particularly if China decides to buy less.

At first sight, all seems to be going well with the pulp and paper industry both in Brazil and neighbouring Uruguay.

Output is being stepped up at the brand new 'Eldorado' mill in Mato Grosso do Sul state, where the world's largest single line mill started up at the end of last year.

Eldorado expects to churn out 1.5mt (million tonnes) this year, close to its capacity, and plans to take output to 1.7mt after de-bottlenecking.

Stora-Enso, a partner with Fibria in the Veracel mill in Bahia, will start up its 1.3mt mill in Uruguay in partnership with Chile's Arauco company in mid year.

Towards the end of 2013, Brazil's second largest pulp maker, Suzano, will start up a 1.5mt-capacity mill at Imperatriz in Maranhao state, the first of two mills Suzano plans to build in the north east.

Giant packaging company Klabin has made a start on a new 1.5mt pulp plant, to be built in Parana state at a cost of US\$3.4 billion. Soon after Klabin's new mill starts up, a new 400,000-tonne paper machine will start turning much of the extra pulp, to be made from a mixture of both long fibre pine and short

fibre eucalyptus pulps, blended into tough packaging paper.

Chile's CMPC company, which two years ago bought the 450,000 tonnes capacity Guaiba mill near Porto Alegre, Rio Grande do Sul from Fibria, is to push capacity there up to 1.7mt by 2015.

Eldorado says it plans to build a second and possibly a third line at its mill in Mato Grosso state in the next few years, although it remains to be seen whether this actually happens. The markets will decide.

All in all, the mills under construction or planned in Brazil and Uruguay, will produce an extra 6mt of pulp in the next 18 months. Last year, 8.9mt of the 13mt made in Brazil and in 2011, was exported.

The total world market for the short fibre pulp made from eucalyptus, Brazil's speciality, now totals about 100mt. Demand is now growing by about 2% a year.

Analysts say there is not space for more than one large new mill each year.

If more than about 1.5mt of extra pulp comes on the market, which could happen in 2013, prices could tumble.

On the other hand, several high cost mills in Europe and North America have closed down in recent times, as has the 450,000 tonnes a year Jari mill in northern Brazil.

The Jari mill is to be re-built, and will produce about 250,000 tonnes of soluble pulp a year when it starts up again in a few years time.

Exactly what will happen in the next few years to the economy in China, now the customer for more than a quarter of Brazil's market pulp, is a worry. Also unclear is whether the economies of EU members, which between them buy almost half of Brazil's pulp and pay much more for it than the Chinese do, will recover any time soon.

These fears are delaying plans by Brazil's largest pulp maker, Fibria, the company resulting from the merger of Aracruz and Votorantim four years ago, to build a second line at its Tres Lagoas mill in Mato Grosso do Sul.

The year 2012 was a difficult one for the Brazilian exporters. The average price of the pulp shipped last year, \$526 per tonne, was 6% less than it had been in 2011.

The situation improved slightly towards the end of last year and at the beginning of 2013, when three price rises were forced through.

Because the Brazilian currency lost 14% against the US dollar last year, companies are now receiving more in local currency for their pulp than they did when the Real was stronger, which helps.

But although the weaker currency aids export sales, it also makes servicing the large borrowings the mills made to pay for the new mills much more of a burden. So a devaluation is a mixed blessing for the pulp industry.

The leading customer for the pulp made at Fibria's 'Tres Lagoas' mill in Mato Grosso do Sul, International Paper, is considering building a second machine to make printing and writing paper there. But Fibria, whose financial position has not yet entirely recovered from the effects of hedging operations which went badly wrong back in 2008, continues to be cautious, and has not yet given the go ahead to an expansion at its Tres Lagoas mill.

Fibria executives suggest that a new round of mergers might make sense for Brazil's pulp industry, as it would allow further economies of scale and synergies to be achieved.

Productivity continues to rise in Brazil's forests, where more than 40 cubic metres of wood is added to each hectare each year, at the newest plantations.

This high yield compares with less than 20 cubic metres per hectare/year a decade ago, and is twice as much as anywhere else. But the cost of everything else in Brazil, labour, land, fuel, transport and chemicals have all shot up in the past few years.

As a result, Brazil is no longer the world's lowest cost pulp producer, the crown having been lost to countries in Asia.

A study by the Poyry consultancy suggests that if technological advances continue, a hectare of forest in Brazil could produce an unbeatable 70 cubic metres of wood each year, but costs are expected to continue to rise.

The Suzano company, which has had difficulty raising the last tranche of the US \$3 billions its new mill in Maranhao will cost,



has been selling surplus assets, as has Fibria.

Suzano has now shelved plans for a second, twin mill for the north east.

The second mill, to be built in the state of Piaui, will also be located alongside the North-South railway, a branch of the Vale's Carajas line. All Suzano's pulp will be shipped from the port of Itaqui, where Suzano is building storage facilities.

The journey from Itaqui to Shanghai takes two or three days less than that from Santos, or from Aracruz's Portocel. The shorter journey time helps explain Suzano's enthusiasm for the north east, where another new company planning to make pulp in Brazil, Braxcell wants to build a new mill.

The first generation of modern mills in Brazil, such as the three lines at Aracruz, built in the 1980s, and 90s, Votorantim's Jacarei and Suzano's Muruci mill in Bahia, get wood from plantations about 50km from the mills. This cuts the cost of transport to a minimum.

But the new mills have to bring wood far further than that, while the two in Mato Grosso do Sul, have to transport the pulp they make 1,000km to Santos by train.

If the future is cloudy for the pulp makers, the difficulties facing the paper industry are equally, if not more severe at the moment.

Brazil's 200 or so paper mills now make about 10mt of paper a year.

Brazil's *per capita* consumption continues to be a relatively low 49kg a year, well below that of neighbouring Chile and Argentina, let alone countries in the EU or North America.

While two thirds of the 13mt of pulp now produced each year in Brazil is exported, only about 10% of the paper made in Brazil goes abroad. The great majority of that is sold to other countries in Latin America.

Even though each Brazilians read relatively few newspapers, magazines or books, the import duty on the newsprint and other papers needed for this purpose is kept extremely low. One result of this is that making newsprint in Brazil has never been profitable.

A decade ago, Brazil spent about \$400 million on importing 300,000 tonnes of newsprint, as well 200,000 tonnes of paper of other kinds each year.

Much of the 2mt of paper export exported by Brazil last year, and which earned about \$2 billion last year, was tissue,

BRAZILIAN EXPORTS OF PULP, PAPER AND TIMBER PRODUCTS, TONNES

Type	2012	2011	2010	2009	2008	2007
Pulp	8,940,182	8,910,445	8,803,049	8,591,577	7,216,543	6,584,155
Paper	1,873,189	2,051,259	2,073,305	2,007,305	1,979,613	2,005,601
Plywood	509,126	515,891	613,502	634,970	914,716	1,101,173
Veneer	24,798	29,346	19,059	15,346	52,104	145,580
Sawn wood	607,160	688,495	703,600	716,798	1,127,611	1,724,521
Processed	114,670	117,947	138,248	163,845	248,006	367,096
Board	254,431	193,419	170,801	203,779	252,730	409,072
Other	1,573,030	1,573,751	1,681,000	1,467,057	2,021,840	2,246,748
All wood	3,142,218	3,089,849	3,321,210	3,320,496	4,617,012	5,965,861

Source: Ministry of Trade

together with some printing and writing paper, for which short fibred pulp is very suitable.

In addition, half a million tonnes was packaging paper, about half of it made by Klabin from a blend of short fibre produced in Brazil and long fibre, some imported.

A high proportion of the packaging is high value packaging for liquids.

Last year, about 1.4mt of paper were imported, less than half of which was really use for what may be described as 'literary' purposes. Up to half the paper imported was used to produce the colourful advertising inserts which now come with the newspapers and magazines sold in Brazil.

To discourage this trade, the import tax levied on the paper subject to duty has been raised from 14% to 25%, and any 'non-eligible' paper has to be labelled as such.

Much of what is imported comes from China, much of it made there from pulp imported by China from Brazil.

In the past 20 years Brazil has instigated 55 anti-dumping procedures against China at the World Trade Organization. But until now, China has felt it wise to co-exist peacefully with its trade partners, so has taken no retaliatory action.

But last year, the Chinese authorities claimed that the soluble pulp for making textiles they imported from Brazil, cost much more than the same produce was sold for in Brazil itself.

An anti-dumping action against Brazil is now under way, seen as a retaliation for the restrictions on imports of paper from China.

Demand for the various types of packaging paper made by Klabin and other companies continues to grow far faster than the Brazilian GDP, as consumer durables become more accessible to more Brazilians.

Demand for most types of paper has grown very little in the past few years, output having remained steady at about 10mt, with any increase being supplied by extra imports.

Although slightly more wood, and wood products were exported from Brazil last year than the 3.1mt of 2011, this was still just over half the 6mt exported in 2007 and some earlier years

Eighty per cent of the 10 million cubic metres of timber produced from Brazil's forests each year is used on the domestic market, mostly for construction purposes, or for making furniture.

The United States used to be the leading market for Brazilian timber, and it remains to be seen whether the beginnings of a return to growth by the construction industry there will result in a growth in exports in the near future. About half of exports originate from the Amazon region, the rest comes from planted forests in the south.

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Alesa Engineering Ltd is specialised in tailor made solutions for the pneumatic handling of bulk materials. Travelling ship unloaders are typically designed for capacities above 600 t/h. Dense Phase conveyors is another speciality of which various capacities and conveying distances have been contracted.

ALEX STEWART (INTERNATIONAL) CORPORATION

20 Sefton Business Park
Netherton
Liverpool
Merseyside
L30 1RD
UK
Contact: Mr Alex Stewart
Job Title: MD
T: + 44 151 523 5438
F: + 44 151 523 3760
E: alex.stewart@alexstewartinternational.com
W: www.alexstewartinternational.com
Alex Stewart certifies quantity and quality of all commodity imports/exports, including inspection and analysis. The Alex Stewart International network of regional companies provides inspection and analysis of agricultural products and foodstuffs, fuels, metals and minerals, steel and steel scrap, and also geochemical and environmental services.

ALEX STEWART AGRICULTURE LTD

21 Sefton Business Park
Netherton
Liverpool
Merseyside
L30 1RD

UK
Contact: Mr Glenn Forbes
Job Title: Agriculture Manager
T: + 44 151 525 1488
F: + 44 151 530 1563
E: Glenn.forbes@alexstewartagriculture.com
W: www.alexstewartagriculture.com
Alex Stewart Agriculture provides world class FOSFA and GAFTA approved independent inspection and agriculture laboratory services. We are supported by the A. Norman Tate and Huson and Hardwick Laboratories range of agricultural analytical services for oilseeds, raw & refined sugar, oils & fats, bio energy, grains, fertilizers and other food products.

ALFREDO BRAND P.

Casilla 16871
Santiago
Región Metropolitana
7510147
Chile
Contact: Mr Alfredo Brand
T: + 5622238968
F: + 5623440817
E: abrandp.gm@gmail.com
W: www.abrandp.com

ANKER-FLEXCO 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: info@anker-flexco.de
W: www.anker-flexco.de
Manufacturer and distributor of mechanical belt fastening systems, installation tools, ceramic lagging, cleats and cleaners.

ANTAR@PRESSVSS

Stallings House
Stallings Lane
Kingswinford
West Midlands
DY6 7LG
UK
Contact: Mr Roger Bannister
Job Title: CEO
T: + 44 1384 400088
F: + 44 1384 296268
E: roger.bannister@antar-equipment.com
W: www.pressvss.co.uk
Design and manufacture a large

range of handling equipment for storing, batching, conveying and weighing dry bulk materials. Storage capacities from 10-15 tonnes are catered for. Batching/weighing up to 100tph. Automated control systems ensure accurate dosing/weighing. Design/CAD facilities. Fully equipped and extensive workshop facilities. Over 100 years experience of material handling equipment.

ANVIL ATTACHMENTS

PO Box 216
261 Highway 19
Slaughter
Louisiana
70777
USA
Contact: Mr Shane Toncrey
Job Title: Marketing Director
T: + 1 225 654 8223
F: + 1 225 654 3125
E: Sales@AnvilAttachments.com
W: www.AnvilAttachments.com
Manufacturer of grabs, grapples and clamshell buckets for cable, hydraulic and electro-hydraulic operation. Models for ships-gear, gantry, excavators, crawler cranes and hydraulic equilibrium cranes. Brands include Anvil, Hawco, Pro-line, Owen, Yaun, Williams & Drott. New, used, rentals, rebuilds, repairs, parts and service, since 1969.

ARLONA ENGINEERING

PO Box 41125
Rossburgh
Durban
KZN
4072
South Africa
Contact: Mr Steve Christy
Job Title: Managing Director
T: + 27 31 205 95 90
F: + 27 31 205 98 35
E: steve@arlona.co.za
W: www.arlona.co.za
Design and manufacture of grabs from 3m3 touch down to 12m3 radio remote opening and mobile hopper / conveyor combinations suitable for ship or shore based operations. Customised solutions designed and built by the largest manufacturer of stevedoring equipment in Africa.

ATLAS MANUFACTURING Co. Inc

PO Box 1969
Monticello
MS 39654
USA

Contact: Mr Ashley Watson
Job Title: Sales Manager
T: + 1 601 587 4511
F: + 1 601 587 5393
E: ashley@atlasmanufacturing.net
W: www.atlasmanufacturing.net
Builds new and custom designed single, two, three and four rope cable grabs as well as hydraulic grabs. All Atlas grabs are constructed using high quality alloy steels with heat treated pins and bushings. Atlas also specializes in rebuilding all types of grabs, regardless of the manufacturer.

AURECON

L10 - 55 Grenfell Street
Adelaide
South Australia
5000
Australia
Contact: Mr Stephen Symons

Job Title: Development Manager
T: + 61 8 8237 9905
F: + 61 8 8237 9778
E: SymonsS@ap.aurecongroup.com
W: www.aurecongroup.com

AURECON HATCH

L4, 152 Wharf Street
Spring Hill
Brisbane
Queensland
4000
Australia
Contact: Mr Peter Thomson
T: + 61 7 3166 7777
F: + 61 7 3173 8001
E: brisbane@arecongroup.com
W: www.aureconhatch.com
Aurecon Hatch is a joint venture between leading management and engineering consultancy companies Aurecon and Hatch. Aurecon Hatch provides project management services and site infrastructure design to organisations working in coal, cement, agriculture, seaboard bulk materials handling and heavy haul rail.

AUSENCO

855 Homer Street
Vancouver
British Columbia
V6B 2W2
Canada
Contact: Mr Joel A Cawker
Job Title: VP International,
Process Infrastructure
T: + 1 604 638 4740 (direct)
F: + 1 604 688 5913
E: joel.cawker@ausenco.com
W: www.ausenco.com
A leading EPCM services company operating worldwide in the bulk products materials handling, heavy haul rail, marine terminals, ports, coastal, mining infrastructure, energy and industrial sectors. Ausenco provides engineering expertise for all major design disciplines, as well as simulation analysis, for projects ranging from concept, pre-feasibility, and feasibility level studies through to detailed design and complete project delivery services.

BAYARDS ALUMINIUM CONSTRUCTIONS

PO Box 9
Nieuw-Lekkerland
ZH
2957 ZG
The Netherlands
Contact: Mr Dick de Kluijver
Job Title: Commercial Director
T: + 31 184 683000
F: + 31 184 684345
E: dick.dekluijver@bayards.nl
W: www.bayards.nl
Bulk containers.

BEHN + BATES MASCHINENFABRIK GmbH & Co. KG

Robert-Bosch-Strasse 6
Munster
D-48153
Germany
Contact: Ms Gabriele Buss
T: + 49 251 9796 0
F: + 49 251 9796 260
E: sales@behnates.com
W: www.behnates.com
Manual, semi-automatic and fully automatic filling systems for the

filling of all kind of food and animal feed products into valve and open-mouth bags with filled weights from 1.5 up to 50 kg and big bags of up to 1,800 kg.

BERGU INTERNATIONAL AB

Nygata 30
Box 5006
Helsingborg
S-250 05
Sweden
Contact: Mr Conny Simonsson
T: + 46 42 12 7970
F: + 46 42 12 8002
E: bergu@telia.com
W: www.bergu.com
Design and manufacture bag emptying equipment as well as pneumatic conveyors, silos and silo discharge systems, diverter valves, etc.

BGS HOLLAND

Hooeveeneweg 5
Nieuwerkerk ad IJssel
2913 LV
The Netherlands
Contact: Ms Martina Hermans
T: + 31 180 317838
F: + 31 180 315538
E: info@bgsholland.nl
W: www.bgsholland.nl
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BIRRUS INTERNATIONAL Pty Ltd

10 Dandenang Street
Dandenong
Victoria
3175
Australia
Contact: Mr Paul Shultz
Job Title: Engineering Manager
T: + 613 9769 2646
F: + 613 9769 2535
E: pshultz@birrus.com.au
W: www.birrus.com.au

BLUG CREDEBLUG S.L.

Juan XXIII - 9
Azpeitia
Guipuzcoa
20730
Spain
Contact: Mr JR Zubeldia
Job Title: Commercial Manager
T: + 34 943 810 150
F: + 34 943 815 665
E: jrzubeldia@blug.es
W: www.blug.es
BLUG is strongly related to bulk terminal handling operations for more than 44 years, with different grabs performing successfully in the 5 continents. BLUG's presence in maritime terminals is mainly focused in European, American and African ports as a quality product reference.

BOSCH REXROTH B.V.

Kruisbroeksestraat 1
Boxtel
Noord-Brabant
5281 RV
The Netherlands
Contact: Mr Edwin Doedee
Job Title: Sales Manager,
Materials Handling & Mining
T: + 31 411 65 19 51
F: + 31 411 65 14 83
E: cylinders@boschrexroth.nl
W: www.boschrexroth.nl
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Bühler AG, Grain Logistics, CH-9240 Uzwil, Switzerland
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BOYNE AREA MANUFACTURING (BAM)

1 Altair Drive
Boyne City
MI
49712
USA
Contact: Mr John Laursen
Job Title: Director of Sales & Marketing
T: + 1 231 459 4242
F: + 1 231 459 4243
E: jlaursen@boynearea-mfg.com
W: www.boynearea-mfg.com
Bulk Material Handling Specialist. Design, Engineer and Build, Spouts, Positioners, Gates & Valves, Diverters, Air Flow Conveyors, Hoppers, Bin Vents, & Dust Collectors. We are a new (4yrs.) & growing company with over 100 years of combined experience. Our designs and equipment have been sold and installed throughout the world. Other services - onsite inspection & equipment recommendations.

BROCK GRAIN SYSTEMS

A Division of CTB, Inc
611 N. Higbee Street
PO Box 2000
Milford
Indiana
46542-2000
USA
Contact:
Job Title: Managing Director
T: + 1 574 658 4191
F: + 1 574 658 4133
E: brock@ctbinc.com
W: www.brockgrain.com
Manufactures and supplies enclosed storage systems for grains and animal feeds, including bin silos and conveyor systems.

BRUKS ROCKWOOD INCORPORATION

5975 Shiloh Road
Suite 109
Alpharetta
GA
30005
USA
Contact: Mr Ken Upchurch
Job Title: Vice President of Sales & Marketing
T: + 1 770 849 0100 x109
E: kuh@bruks.com
W: www.bruks.com

BSI INSPECTORATE

Route de Cossonay 28b
Prilly
CH-1008
Switzerland
Contact: Mr Ivan Ivanov
T: + 41 21 623 62 30
F: + 41 21 623 67 00
E: ivan.ivanov@inspectorate.ch
W: www.inspectorate.com
Inspections and testing of various commodities worldwide.

BUCKET MART INC.

PO Box 1240
Marion
Illinois
62959
USA

Contact: Mr Jack Johnson
Job Title: President/CEO
T: + 1 813 390 8626
F: + 1 813 908 9474
E: salesbucketmart@aol.com
W: www.bucketmart.net
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BÜHLER AG, GRAIN LOGISTICS



Gupfenstrasse 5
Uzwil
CH-9230
Switzerland
Contact: Mr Marcel Scherrer
T: + 41 71 955 3950
E: marcel.scherrer@buhlergroup.com
W: www.buhlergroup.com
Customized solutions for grain handling.
Bühler Grain Logistics Terminals is the ideal partner when it comes to reliable solutions in the area of grain handling and storage. The company's wide range of offerings includes ship loading and unloading solutions, conveying systems and silos as well as storage equipment.

BULK LIFT INTERNATIONAL

1013 Tamarac Drive
Carpentersville
IL
60110
USA
Contact: Mr Brian Kelly
Job Title: National Sales Manager
T: + 1 847 428 6059 x 215
F: + 1 847 428 7180
E: briank@bulklift.com
W: www.bulklift.com
Manufactures a wide array of flexible intermediate bulk containers (FIBCs), or bulk bags. With manufacturing facilities worldwide and stocking available in the United States the company can offer just in time deliveries of all bulk bag requirements.

BUTTIMER GROUP



Carrigee Industrial Estate
Cahir
Co. Tipperary
Republic of Ireland
Contact: Mr Fergal Buttimer
Job Title: Director
T: + 353 52 744 1377
F: + 353 52 744 1087
E: info@buttimerbulk.com
W: www.buttimer.ie or www.buttimerbulk.com
Buttimer Group specialises in the mechanical handling of dry bulk products such as grains, ores, coal, biomass. Over 30 years' experience delivering design, installation and management of turnkey bulk terminals, mechanical handling systems and

bespoke equipment internationally.

BV BECO

De Limiet 18
Vianen
Utrecht
4131 - NR
The Netherlands
Contact: Mr Henk van Vuren
Job Title: Managing Director
T: + 31 347 323 100
F: + 31 347 377 780
E: h.vanvuren@beco-vianen.nl
W: www.becograbs.com
One of the world's leading specialists in grabs for the bulk market. For more than 20 years Beco Grabs have been providing high-end, ready-to-run technological solutions. We have a big scale of products: Grabs - Wheelloader, excavator and demolition equipment - Tipping Trailers - Hooklift carriers - Harbour- and industrial trailers.

CACHAPUZ BILANCIAL GROUP

Parque Industrial de Sobreposta
Apartado 2012
Braga
Braga
4701-952
Portugal
Contact: Mr Nuno Matos
Job Title: International Business Developer
T: + 351 253 603 480
F: + 351 253 603 485
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
Istanbul
81540
Turkey
Contact: Mr Murat Calim
T: + 90 533 226 4923
F: + 90 216 399 79 71
E: info@calimkepcce.com
W: www.calimgrabs.com
Calim Grabs is a manufacturer of mechanical, electro-hydraulic and remote controlled grabs.

CAMAR MILL SYSTEMS LTD

P.O. Box 419
1600 King St N
St. Jacobs
Ontario
N0B 2N0
Canada
Contact: Mr Rick Weber
Job Title: President
T: + 1 519 664 3709
F: + 1 519 664 3700
E: rick@camar.ca
W: www.camar.ca

CAMBELT INTERNATIONAL CORP

2820 West. 1100 South
Salt Lake City
Utah
84104
USA

Contact: Mr Dave Hansen
Job Title: VP, Sales
T: + 1 801 972 5511 ext 205
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

PO Box 566
Gunnarstorp
Bjuv
SE-267 25
Sweden
Contact: Ms Emily Cueva
Job Title: Communications Manager
T: + 46 42 858 00
F: + 46 42 858 99
E: blksales@cargotec.com
W: www.siwertell.com
Supplier of Siwertell screw-type barge and ship unloaders for a wide range of dry bulk materials including grain and agribulk, pneumatic unloaders for grain and agribulk, ship loaders of screw or belt technologies, mechanical and pneumatic conveying and storage systems.

CATERPILLAR BELGIUM

Ave des Etats Unis
Charleroi
B6041
Belguim
Contact: Mr Philippe Michaux
Job Title: Marketing
F: + 32 71 25 29 56
E: michaux_philippe@cat.com

CATERPILLAR INC

100 NE Adams Street
Peoria
IL
616-6335
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
Lugano
CH-6900
Switzerland
Contact: Mr Michael Scheepers
Job Title: Director, Investor Relations & PR

T: + 41 911 911 4010
F: + 41 911 922 54 00
E: michael.scheepers@cavotec.com
W: www.cavotec.com
Cavotec Group is a global leader in connecting mobile equipment. Products from the Cavotec Group manufacturing units include: Exe radio remote controls, electrical connectors up to 15kV, flexible cables, cable reels, and slipping 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 Steve W 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

Yakacik Yanyol
Senem Sokak No:11
Kartal
Istanbul
34876
Turkey
Contact: Mr Cihan Cesur
Job Title: Sales & Marketing Director
T: + 90 216 377 28 55
F: + 90 216 377 11 90
E: info@cesur.com
W: www.cesur.com
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 SRL.

Unità Operativa
Via Sigalina a Mattina, 12/14
Montichiari
BS
25018
Italy
Contact: Mr Italo Civettini
Job Title: CEO
T: + 39 0309 64199
F: + 39 0302 072026
E: sales@cfshandling.it
W: www.cfshandling.it

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
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South Gate, No 91
North Road
Xi San Huan
Beijing
100044
China
Contact: Mr Zheng Liu
Job Title: Director of Int. Mrktg,
Material Handling Division
T: + 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
Singapore
038989
Singapore
Contact: Mr Eugene Tan
T: + 65 6808 1880
F: + 65 6808 1881
E: sg@chinasonangol.com
W: www.chinasonangol.com

CHRISTIANSON SYSTEMS INC.

20421 15th Street Southeast
Blomkest
Minnesota
56216
USA
Contact: Mr Mike Schow
Job Title: Sales Manager
T: + 1 320 995 6141
F: + 1 320 995 6145
E: sales@christianson.com
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.

CHRONOS BTH

Unit 1, Centurion Business Park
Blenheim Industrial Estate
Nottingham
Notts
NG6 8WN
UK
Contact: Mr Mike Simmonds
Job Title: Sales Director
T: + 44 115 9351351
F: + 44 115 9606941
E: info@chronosbth.com
W: www.chronosbth.com
Chronos BTH supply a range of bulk weighers and controllers for intake / outloading free-flowing

bulk materials. Complimenting these is a diverse range of material handling, bagging and palletising systems, and the Containerpak™ mobile bagging unit. Equipment service and spares.

CHRONOS BTH GmbH

Löhstrasse 18
Post Fach 1155
Hennef
D53773
Germany
Contact: Mr Ingo Jonas
Job Title: Managing Director
T: + 49 2242 9335 0
F: + 49 2242 9335 186
E: info@chronosbth.com
W: www.chronosbth.com
CHRONOS BTH is an international leader in the development, manufacture and marketing of Dosing Systems, Loose Fill Bagging Systems, Densification Bagging Systems, Palletizing Systems, as well as Mixing Lines equipments, which are tailored to meet customers' individual needs, whether for powders, fibrous or granular materials.

CIMBRIA BULK EQUIPMENT

Drejervej 10
Sunds
DK- 7451
Denmark
Contact: Mr Lars Noergaard
Job Title: Managing Director
T: + 45 72 42 24 00
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

101 Christine Drive
Belen
NM
87002
USA
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
Illzach
Cedex
F-68316
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 Dukeway
Teesside Industrial Estate
Thornaby
Stockton on Tees
TS17 9LT
UK
Contact: Mr Ian Barnard
Job Title: Managing Director
T: + 44 1642 753260
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).
Regional contacts:
COBRA EURASIA; Tel: + 73 84 25 85 598, Email: cobraeurasia@bk.ru
COBRA AMERICA; Tel: + 1 423 968 9700, Email: bambi@cobramerica.com
COBRA SOUTH PACIFIC; Tel: + 61 2 4722 5633, Email: terry@cobrasp.com.au

COFELY EXPERTS BV

Computerweg 21
PO Box 34
Amsterdam
1000 AA
The Netherlands
Contact: Mr John Visser
Job Title: General Manager
T: + 31 88 484 90 00
F: + 31 88 484 93 00
E: john.visser@cofely-gdfsuez.nl
W: www.cofely-gdfsuez.nl

CONDEPOLS

Pozuelo de Alarcón
Madrid
28037
Spain
Contact: Mr Ignacio Baillo
Job Title: Commercial Director
T: + 34 91 337 7048 / +34 91 337 7040
F: + 34 91 515 3172
E: ignacio.l.baillo@condepols.es
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-WAMPLER AMERICAS



10102 F Street
Omaha
Nebraska
NE 68127
USA
Contact: Mr Mark Zuroske
Job Title: Market Development
Manager, Bulk Handling & Mining
T: + 1 402 952 9325
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)

5646 Shelby Oaks Drive
Memphis
Tennessee
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: Mr Mike Roberts
Job Title: Group
Manager/Engineered Systems
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
Nörtheim
D-37154
Germany
Contact: Mr Andrew Soine
Job Title: International Sales
Manager MAXOFLEX
T: + 45 512 99056
F: + 45 864 68841
E: andrew.soine@cbg.contitech.de
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



Niederbieger Straße 9
Weingarten
88250
Germany
Contact: Mrs Andrea Trautmann
Job Title: Marketing Manager
T: + 49 751 408 578
F: + 49 751 408 99578
E: andrea.trautmann@coperion.com
W: www.coperion.com

CPS PROJECTS (PTY) LTD

PO Box 47261
Greyville
KZN
4023
South Africa
Contact: Mr Banzi Majola
Job Title: Managing Director
T: + 27 31 466 4396
F: + 27 31 466 4399
E: banzi@cpsprojects.co.za
Affiliated with CPS Projects Pty and Salzgitter SA Pty in South Africa, Portquip Pty provides mechanical shiploaders, grabs and truck loaders and unloaders.

GST 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: thill@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.

GST STORAGE

9701 Renner Blvd, Suite 150
Lenexa
KS
66110-2907
USA
Contact: Mr David Wheat
Job Title: Director
T: + 1 913 621 3700
F: + 1 913 621 2145
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

9 Station Road
Adwick-le-Street
Doncaster
South Yorkshire
DN6 7BB
UK
Contact: Mr David Trueman
Job Title: Sales Director
T: + 44 1302 330 888
F: + 44 1302 724 731
E: david.trueman@dbis.biz
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
USA
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

ljzendijkseweg 5
Biervliet
Zeeland
4521 GX
The Netherlands
Contact: Mr Peter De Regt
Job Title: Director
T: + 31 115 481238
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.

4220 Shawnee Mission Pkwy
Suite 301B
Kansas City
Kansas
66205-2513
USA
Contact: Mr Sudy L Vohra
Job Title: Executive Vice President & General Manager
T: + 1 913 261 2406
F: + 1 913 261 2470
E: sudyv@dmwcc.com
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 Egypt and China. The Products include Pipe Conveyors and Air Supported Conveyors.

DEMAG CRANES & COMPONENTS GMBH

Benefit recipient: Gottwald Port Technology
Forststrasse 16
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

PO Box 1138
Crystal Lake
IL
60039-1138
USA
Contact: Mr Thomas DeMarco
Job Title: President
T: + 1 815 344 2222
F: + 1 815 344 2223
E: Sales@DeMarcoVacuums.com
W: www.DeMarcoVacuums.com
Manufacturer of MaxVac industrial vacuum systems and vacuum loaders for portable, stationary and central manifold systems.

DINNISSEN BV

Horsterweg 66
Sevenum
NL-5975 NB
The Netherlands
Contact: Mr Henri A J M Michiels
Job Title: Director
T: + 31 77 467 35 55
F: + 31 77 467 37 85
E: powtech@dinnissen.nl
W: www.dinnissen.nl
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

Gieterij 3
PO Box 6
Noordwijkerhout
Zuid-Holland
NL-2210 AA
The Netherlands
Contact: Mrs Tonneke Krempel
Job Title: Manager Marketing Services and PR
T: + 31 252 361 800
F: + 31 252 375 934
E: dmn@dmn-nwh.nl
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

5450 East Street
Saginaw
Michigan
48601
USA
Contact: Mr Ross Lake
Job Title: President
T: + 1 989 777 2050
F: + 1 517 777 3477
E: sales@dome-corp-na.com
W: www.dome-corp-na.com

DOME TECHNOLOGY

3007 East 49th Street North
Idaho Falls
Idaho
83401
USA
Contact: Mr James Moore
Job Title: Business Development
T: + 1 208 529 0833
F: + 1 208 529 0854

E: james.moore@dometech.com
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

4355 N Haroldsen Drive
Idaho Falls
Idaho
83401
USA
Contact: Mr Mike Hunter
Job Title: General Manager
T: + 1 208 522 5520
F: + 1 208 522 5344
E: domtec@domtec.com
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

Büssingstraße 1
Haan
42781
Germany
Contact: Mrs Susanne Fulko
Job Title: Marketing Manager
T: + 49 21 29 569 0
F: + 49 21 29 569 100
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 in the grain, agriculture and feed industry.

DOOSAN BENELUX SA

Drève Richelle 167
Waterloo
B-1410
Belgium
Contact: Mr George Schmalzried
Job Title: Public Relations Manager
T: + 32 2 371 6811
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

531 Roselane Street
Suite 810
Marietta
Georgia
30060
USA
Contact: Mrs Amy D. Duncan
Job Title: Marketing Manager
T: + 1 770 423 9895
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 9 828 8012
E: info@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: Ms Laura Stiverson
Job Title: General Manager
T: + 1 309 693 8600
F: + 1 309 693 8605
E: info@dustboss.com
W: www.dustboss.com
The DustBoss dust and odour control system combines an oscillating ducted fan with high pressure mist to create a virtual dust/odour barrier. Proprietary technology delivers superior results, blanketing up to 125,000 square feet with a fine mist of water droplets that are the optimal size for trapping dust particles.

DUST SOLUTIONS INC.

14300 N.E. 20th Ave.
D102-185
Vancouver
Washington
98686
USA
Contact: Mr David Gilroy
Job Title: Sales Manager
T: + 1 360 546 0072
F: + 1 360 546 0073

E: d.gilroy@nodust.com
W: www.nodust.com

E-CRANE WORLD WIDE



Koekoeklaan 53
Adegem
B-9991
Belgium
Contact: Mr Bas Tolhuizen
Job Title: International Sales Manager
T: + 31 165 320100
F: + 31 165 320759
E: bas.tolhuizen@e-crane.com
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



1332 Freese Works Place
Galion
Ohio
44833
USA
Contact: Mr Mark W Osborne
Job Title: President
T: + 1 419 468 0090
F: + 1 419 468 0074
E: mark.osborne@e-crane.com
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 EUROARGO SERVICES AS

Tongavej 19
Arhus C
DK-8000
Denmark
Contact: Mr Peterson
T: + 45 86 20 82 20
E: ecs@eurocargoservices.dk
W: www.eurocargoservices.dk
Custom clearance
Evaluation of damages

ELGIN ENGINEERING AND CONSTRUCTION

Suite 1800
222 South Riverside Plaza
Chicago
Illinois
60606
USA
Contact: Mr Bob Williams
Job Title: Marketing Director
T: + 1 312 236 8100 ext: 340
F: + 1 312 726 2872
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/loadout systems, environmental controls.

ENCLOSED BULK SYSTEMS BV

Wijkmeer 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 gauging, 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 Aboobacker
Job Title: Operations & Sales Manager
T: + 971 506 408 626
F: + 971 426 822 17
E: yasararafat@gmail.com
W: www.equipo.ae

ESI EUROSILLO 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.

EUROMECC 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@euromecsril.info
W: www.euromecsril.com
EUROMECC, 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.

EUROTECH 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 Mark Schinkel
T: + 31 75 6810 413
F: + 31 75 6315 996
E: h.vantil@figee.com
W: www.kenz-figee.com
Engineering, manufacturing, commissioning and service of a wide range of grab cranes, including floating Lemniscate cranes, floating Derrick cranes, single jib cranes, double jib 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.

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 Romuald Hartmann
Job Title: CEO
T: + 49 6834 470 0
F: + 49 6834 470 339
E: wadgassen@flsmidth.com
W: www.flsmidth.com
FLSmidth's bulk material handling systems and components are based on more than 60 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 unloaders, 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 Thomas Musschoot
T: + 1 815 455 3222
F: + 1 815 455 2285
E: tmusschoot@generalkinematics.com
W: www.generalkinematics.com
General Kinematics specializes in vibrating and rotary equipment and solutions for bulk processing of material in the foundry, recycling, scrap, mining, minerals, food, chemical, and wood industries. Each piece of GK equipment is custom engineered to your specifications to meet

your process objectives.

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
Specialises 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

Bjoernstletteveien 2
Porsgrunn
N-3917
Norway
Contact: Mr Knut Halvorsen
Job Title: Commercial Group Manager
T: + 47 90 08 74 08
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.

GOTTWALD PORT TECHNOLOGY GMBH

Forststrasse 16
Düsseldorf
D-40597
Germany
Contact: Mr Giuseppe Di Lisa
Job Title: Sales Director
T: + 49 211 7102 0
F: + 49 211 7102 3651
E: info@gottwald.com
W: www.gottwald.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.

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 shiplading 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 Gulden 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 Köyü
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, Maithilli'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@rhdivh.com
W: www.royalhaskoningdhv.com

HASLER INTERNATIONAL SA

Z.I. De l'Abbaye
Pont-Evêque
38780
France
Contact: Mr Michel Jamey
Job Title: President and 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, Haysech 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 plastic, aluminium and steel 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

IBC INTERNATIONAL HANDLING AB

Hamn. 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 IBC 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

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

INSPECTORATE INTERNATIONAL LTD

2 Perry Road
Witham
Essex CM8 3TU
UK
Contact: Mr Julian Sowry
Job Title: Sales & Mktg Mngr,
Steel & Energy Products
T: + 44 1376 536849
F: + 44 1376 520819
E: client.services@inspectorate.com
W: www.inspectorate.com
Inspectorate is one of the world's largest independent inspection companies undertaking commodity inspection and analysis services for bulk commodities.
Its UK Lab is equipped to carry out all types of analysis through classical wet chemistry, fire assay and instrumental techniques, accredited to UKAS/ISO 17025 and approved by the LME.

INTERBULK ENTERPRISE

12 Mariani Walk
Singapore
507172
Singapore
Contact: Mr Michael Lian Soon
Leong
T: + 65 654 66335 / 4688
F: + 65 654 50985
E: liancom@singnet.com.sg
Bulk bag packaging items.

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
 NE
 68142
 USA
 Contact: Mr Ray Vrtiska
 Job Title: VP Sales, Bulk Material
 Handling
 T: + 1 402 330 1500
 F: + 1 402 330 3350
 E: bulkmatt@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 35 49 32 411
 F: + 39 35 49 32 409
 E: fabrizio.bonfanti@italgru.it
 W: www.italgru.com

J & B GRABS B.V.

PO 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.

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: mail12@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 District
 Hsiao Kang
 Kaohsiung
 812
 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' experience devoted to operation international business.



JEM International
JEMESP
 Express Scale Parts

SELF CONTAINED PORTABLE BAG PLANT

A TYPICAL SYSTEM CONSISTS OF A BAG FILLING SCALE, BAG CLOSING CONVEYOR, BAG CLOSING DEVICE, AIR COMPRESSOR, SURGE HOPPER, AND CONTROL PANEL MOUNTED AND INSTALLED IN A CONTAINER DESIGNED FOR EASY INSTALLATION AT PORTS OR PROJECT SITES.

- DURABLE
- HIGH CAPACITY
- LOW MAINTENANCE
- ECONOMICAL



6867 MARTINDALE SHAWNEE, KS 66218 U.S.A.
 +1 913-441-4787
 www.jemesp.com

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
Gebze
KOCAELI
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 Hasköy.

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 density 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@ardelt.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

Spinnereistraße 13
Leipzig
04179
Germany
Contact: Ms Gabriela Schilk
T: +49 3 41 49 53 212
F: +49 3 41 49 53 125
E: juergen.kuehn@kirow.de
W: www.kranunion.de

LADIG SYSTEMS INC



14535 Dragoon Trail
Mishawaka
IN 46544
USA
Contact: Mr Mike Schuster
Job Title: Vice President
T: +1 574 256 0204
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

Marsittie 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 including 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-WERK NENZING GmbH

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 200-2000 mm and length up to 24m, loading tubes - patented - PU flex, loading tubes of many materials, filter for loading equipment, electric rope winches, bellows 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 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: +1 865 984 5286
F: +1 865 977 4131
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.

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 conveyor, 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
Leratsfontein
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: contact@molemaster.com
W: www.molemaster.com
Silo, bin, bunker and process vessel cleanout and unlogging services and equipment.

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 and belts and ATEX conform safety monitoring equipment. Engineering and problem solving. Belt hole punching service up to 2000 mm width on CNC machine Specialist in abrasion resistant liners for bulk handling equipment.

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 the handling of bulk commodities such as cereals and fertilizers in ports and/or inland locations. Involvement ranges from positioning of Nectar's own mobile bagging equipment to handle one-off cargoes or long term lease.

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 tailor-made 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

NEUERO

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 1,200 tph 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
Hoofdorp
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@nkmoell.com
W: www.nkmoellspecialcranes.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: arietun@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: wmvanduynd@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 398850
F: + 49 451 392374
E: sigvard.orts-jun@orts-gmbh.de
W: www.orts-greifer.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, special constructions, repair and overhauling of grab s, also from other makers.

**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 4407
E: enquiries@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**

Vejevængen 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

Hundecker 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

Via Monte Grappa, 8
Galliera Veneta (PD)
35015
Italy
Contact: Ms Monica Giatin
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: Ms Jennifer Haworth
Job Title: Sales & Marketing
Assistant
T: + 1 270 442 1996 (ext 213)
F: + 1 270 442 5214
E: sales@pebco.com
W: www.pebco.com
PEBCO® is recognized worldwide 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® chutes, dustless loading spouts, and telescopic chutes.

**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
BILANCIALI GmbH**

Linker Kreuthweg 9
Affing-Mühlhausen
D-86444
Germany
Contact: Ms Susanne Geller-Dürr
Job Title: Marketing 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: joseraimon.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 SA

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 transshipment capacity up to approx. 2000 ton/hour. We are specialized in shipboard cranes, mobile cranes and harbour cranes for dredging, transshipping, 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
PORTPACK

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
New York
New York
12979
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

Fransse Akker 1
Breda
4824 AL
The Netherlands
Contact: Mrs Monique Kuijer-Heessels
Job Title: Communication & Marketing
T: + 31 76 524 2513
F: + 31 76 522 8039
E: monique.heessels@preciamolen.nl
W: www.preciamolen.nl
For more than 143 years Precia Molen is specialized in industrial

weighing equipment such as weighbridges, hopperscales, baggingscales, platformsscales, truckdumpers etc.

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.quattrosomics.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
Oxford Road
Sevenoaks
Kent
TN14 5EL
UK
Contact: Mr Joe Naylor
Job Title: Sales Manager - Beltweighers
T: + 44 1732 781 300
F: + 44 1732 781 311

E: joe.naylor@proconeng.com
W: www.proconeng.com
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
Jln. Hayam Wuruk No. 8
Jakarta
10120
Indonesia
Contact: Mr Wahyono Wardiman
Job Title: Conveyor Belt Division
T: + 62 21 3517590
F: + 62 21 3517591
E: conveyor.div@bandoindonesia.com
W: www.bandoindonesia.com
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

2120 Fairmont Avenue
Reading
PA

19612
USA
Contact: Mr Ron Mesing
Job Title: Project Development Manager
T: + 1 412 384 5592
F: + 1 412 384 8910
E: ron.mesing@qpllas.com
W: www.systemtivar.com
With more than 30 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.

Via del Cmapo Sportuio 40
Mezzana
48123
Italy
Contact: Ms Sara Mandarini
Job Title: Head of Advertising
T: + 39 0535618 205
F: + 39 0544411 099
E: sara.mandarini@wamgroup.com
W: www.roncuzzi.com
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.

PORTPACK UK LIMITED

Offer weighing and bagging solutions for direct discharge operations



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

Tel: +44(0)1159 680130 . Fax: +44(0)1159 680256 . Email: portpack@portpack.biz . Website: www.portpack.biz

RBL-REI FRANCE

11 Boulevard Brune
Paris
Cedex 14
75682
France
Contact: Mr Sébastien Bouhours
T: + 33 2 41 21 19 40
F: + 33 2 41 21 19 59
E: s.bouhours@rbl-france.com
W: www.rblrei-france.com
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 LTD

Cirencester Road
Minchinhampton
Stroud
Gloucestershire
GL6 9BH
UK
Contact: Mr Mark Evans
Job Title: Business Development Manager
T: + 44 1453 733300
F: + 44 1453 733311
E: info@rdstec.com
W: www.rdstec.com
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.

REMA TIP TOP GmbH

Business Unit Industrie
Gruber St. 63
Poing
Bavaria

D-85586
Germany
Contact:
T: + 49 8121 707 245
F: + 49 8121 707 222
E: info@tipstop.de
W: www.rema-tipstop.com
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.

RIVER CONSULTING

445 Hutchinson Ave
Suite 740
Columbus
OH
43235
USA
Contact: Mr Walter Martin
Job Title: Vice President
T: + 1 614 890 3456
E: wmartin@riverconsulting.com
W: www.riverconsulting.com
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.
Coleford Road
Sheffield
S9 5PA
UK
Contact: Mr John Skidmore
Job Title: Sales Director
T: + 44 114 244 4221
F: + 44 114 243 3066
E: skidmorej@robson.co.uk
W: www.robson.co.uk
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 Plant.

RONIN GMS

No 1 Nobel Avenue
Modderfontein
Johannesburg
Gauteng
1645
South Africa
Contact: Mr Ferdinand Meyer
Job Title: Sales and Marketing Manager
T: + 27 11 608 3666
F: + 27 11 608 4679
E: ferdi@roningms.com
W: www.roningms.com
Ronin GMS supplies Bulk Inventory management solutions, analytical grading equipment and services to the Southern African Grain Handling Industry. We provide Cargo Monitoring, Bulk Audits, Portside and Marine services on hard Commodities. We promote our Laser Inventory Systems Worldwide.

ROYAL HASKONING DHV



George Hintzenweg 85
Rotterdam
3068 AX
The Netherlands
Contact: Ms Berte Simons
Job Title: Director Advisory Group
T: + 31 10 2865 398
F: + 31 10 443 3688
E: info@rotterdam.royalhaskoning.com
W: www.royalhaskoning.com
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.

RTA Alesa

Max Hogger-Strasse 6
Zurich
CH - 8048
Switzerland
Contact: Mr Hanspeter Stahl
T: + 41 44 435 33 33
F: + 41 44 435 33 66
E: hanspeter.stahl@riotinto.com

W: www.rtaalesa.com
Specialised in tailor made solutions for the pneumatic handling of bulk materials. Travelling ship unloaders are typically designed for capacities above 600 t/h. Dense Phase conveyors is another speciality of which various capacities and conveying distances have been contracted.

RUBB BUILDINGS LTD

Dukesway
Team Valley Trading Estate
Gateshead
Tyne & Wear
NE11 0QE
UK
Contact: Ms Clare Wilson
Job Title: Marketing Director
T: + 44 191 482 2211
F: + 44 191 482 2516
E: info@rubb.co.uk
W: www.rubb.co.uk
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.

Via A Toscanini 1
Almé
Bergamo
24011
Italy
Contact: Mr Carsten Spanggaard
Job Title: Group Sales Director
T: + 39 035 430 0111
F: + 39 035 545 700
E: rulmeca@rulmeca.it
W: www.rulmeca.com



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- Port Planners
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- Marine Experts
- Civil, Mechanical and Electrical Engineers

Johan Pruisken – Director Advisory Group
johan.pruisken@rhdhv.com
+31 62906586 / +31 102865445

royalhaskoningdhv.com

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.

SALZGITTER MASCHINENBAU AG/PEINER GRABS

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@smag.de
W: www.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 (sawing units) and special grabs for all kinds of bulk materials for various applications and purposes.

SAMSON MATERIALS HANDLING LTD



Gemini House
Cambridgeshire Business Park
1 Bartholomew's Walk
Ely
Cambridgeshire
CB7 4EA
UK
Contact: Mr Andy Blythe
Job Title: Managing Director
T: + 44 1353 665001
F: + 44 1353 666734
E: sales@bwmech.co.uk
W: www.bwmech.co.uk
Ship Loading and Unloading
Intake and Storage of cereals and derivatives using the B&W mobile Shiploader, Eco-Hopper, Samson™ Surface Feeder and Stormajor™ Radial Boom Stackers
Concepts; offering a unique combination of high performance and flexibility.

SARTORIUS MECHATRONICS T&H GmbH

Meiendorfer Strasse 205
Hamburg
D-22145
Germany
Contact: Mr Johannes Kratz
Job Title: Marketing Manager
T: + 49 40 67960303
F: + 49 40 67960383
E: info.mechatronics@sartorius.com
W: www.sartorius.com
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 cosmetics industries, among others.

SCHENCK PROCESS UK LIMITED

Carolina Court
Lakeside
Doncaster
South Yorkshire
DN4 5RA
UK
Contact: Mr Paul Markwell
Job Title: Marketing Manager
T: + 44 1302 321 313
F: + 44 1302 554 400
E: enquiries@schenckprocess.co.uk
W: www.schenckprocess.co.uk
Schenck Process provides innovative solutions for the handling of bulk materials using pneumatic and mechanical conveying technologies together with air-filtration and weighing equipment to give a comprehensive package of products and services for dry cargo and materials.

SCHENCK PROCESS UK LTD T/A REDLER

Redler House
Dudbridge
Stroud
Gloucestershire
GL5 3EY
UK
Contact: Mr Andrew Workman
Job Title: Director - Bulk Materials Handling
T: + 44 1453 761 784
F: + 44 1453 763 582
E: sales@redler.com
W: www.redler.com
Leading global supplier of bulk materials handling and storage systems. Known for quality and reliability. Can offer a turnkey package for a grain storage complex or a single machine from its portfolio of conveyors and elevators ranging from 10 to 2000 tonnes per hour. A range of belt conveyors, mobile hoppers and flat store filling "bridge" conveyors is also available.

SCHOUTEN COMMODITIES BV

Burgstraat 12 4283 GG Giessen
Giessen
4284 GG
The Netherlands
Contact: Mr Marius van Doorn
Job Title: Commercial Manager
T: +31 183-446451
E: info@schoutenproducts.com
W: www.schoutenproducts.com

SCORPIO ENGINEERING PVT. LTD

Scorpio House
132 Wheeler Road
Cox Town
Bangalore
560 005
India
Contact: Mr Jacob P.
Job Title: VP - Marketing & Application
T: + 91 99801 625 39
F: + 91 80 2548119
E: jacob@scorpioengg.com
W: www.scorpioengg.com
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.

SEABULK SYSTEMS INC

Suite 150
10271 Shellbridge Way
Richmond
British Columbia
V6X 2W8
Canada
Contact: Mr Sidney Sridhar
Job Title: President
T: + 1 604 273 1378
F: + 1 604 273 1358
E: sbs@seabulk.com
W: www.seabulk.com
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

Box 111 43
Bromma
S-161 11
Sweden
Contact: Ms Eva Söderholm
Job Title: Assistant
T: + 46 8 764 74 00
F: + 46 8 764 75 00
E: inform@s-e-g.com
W: www.s-e-g.com
S-E-G is one of few companies in the world specializing in industrial weighing. For over 50 years we have acquired a unique knowledge in our special fields such as Belt Scales, Mass Flow Meters, Batching Systems, and Level Measuring.

SEMPERTRANS FRANCE BELTING TECHNOLOGY SAS

Sempertrans Marketing
10 rue des charretiers
Argenteuil Cedex
95104
France
Contact: Ms Catherine Flichy
T: + 33 1 30 25 72 00
F: + 33 2 39 80 46 16
E: contact@sempertrans-france.com
W: www.semperttrans.com
SEMPERTRANS has been developing, manufacturing and installing conveyor belts for more than 50 years. Its knowhow, its experience and the quality of its products make SEMPERTRANS one of the world's leading companies in its field.

SENNEBOGEN MASCHINENFABRIK GmbH



Hebbelstrasse 30
Straubing
D-94315
Germany
Contact: Mr Bernhard Kraus
T: + 49 9421 540143
F: + 49 9421 43882
E: marketing@sennebogen.de
W: www.sennebogen.com
SENNEBOGEN offers a wide range of all kinds of materials

handling machines, HD rope excavators/cranes, crawler cranes, telescopic cranes and base carriers. SENNEBOGEN has a specific strength in realizing solutions based on individual customer specifications.

SERVO BERKEL PRIOR

Jan Evertsenlaan 4
Katwijk
2224 SV
The Netherlands
Contact: Mr Erwin van Diest
Job Title: Managing Director
T: + 31 71 4030101
F: + 31 71 4032317
E: info@servoberkelprior.eu
W: www.servoberkelprio.eu
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P O Box 3023
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Nantwich
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UK
Contact: Mr Stuart Henderson
Job Title: Director
T: + 44 1270 619 721
F: + 44 1270 619 742
E: sales@sghequipment.co.uk
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1919 S. Highland Ave
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Illinois
60148
USA
Contact: Ms MaryLynn Dobush
T: + 1 630 953 9300
F: + 1 630 953 9306
E: info@sgs.com
W: www.sgs.com

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Malledijk 18
Spijkenisse
AE
3200
The Netherlands
Contact: Mr Rolf Wiltling
T: + 31 181 69 3260
F: + 31 181 69 3581
E: rolf.wiltling@sgs.com
W: www.sgs.nl

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Unit 16
33 Maddox Street
Alexandria
NSW 2015
Australia
Contact: Mr Stephen Hemsworth
Job Title: National Business Manager
T: + 61 2 8594 0400
F: + 61 2 8594 0419
E: stephen.hemsworth@sgs.com
W: www.au.sgs.com
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A 1150
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Contact: Ms Susann Beyer
T: + 43 1 512 25 67152 137
F: + 43 1 512 25 679
E: sgs_austria@sgs.com
W: www.at.sgs.com

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1 Place Des Alps
PO Box 2152
Geneva
CH 1211
Switzerland
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T: + 41 22 739 9111
F: + 41 22 739 9815
E: richard.lihou@sgs.com
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Xujiahui Road
Shanghai
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Contact: Mr Eric Liu
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3470 Pudong Nan Lu
Shanghai
PR 200125
China
Contact: Mr Chen Kai
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F: + 86 21 5839 9555
E: mail@zpmc.com
W: www.zpmc.com
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Jamnagar
Gujarat
361008
India
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Haiger
Hessen
D-35708
Germany
Contact: Ms Janine Schmidt
Job Title: Marketing & Advertising
T: + 49 2773 9 40019
E: janine.schmidt@sibre.de
W: www.sibre.de

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PO Box 566
Gunnarstorp
Bjuv
SE-267 25
Sweden
Contact: Ms Emily Cueva
Job Title: Communications Manager
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Contact: Mr Andreas Heckel
Job Title: Managing Director
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Maldegem
Oost-Vlaanderen B-9990
Belgium
Contact: Mrs Kathleen Breusegem
Job Title: Sales Dept
T: + 32 50 711801
F: + 32 50 710402
E: sales@sobemai.com
W: www.sobemai.com

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8001 Ranchers Road NE
Minneapolis
Minnesota
MN 55432-3103
USA
Contact: Mr Jeff Lucke
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UK
Contact: Mr Joe Booth
Job Title: Business Developer
T: + 44 113 815 0015
E: engineering@spenceritd.co.uk
W: thespencergroup.co.uk

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Industriestrasse 11
Maienfeld 7304
Switzerland
Contact: Mr Thomas Zanettin
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Suite 905
Montreal, Quebec
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Contact: Mr Henry Nowodworski
Job Title: President
T: + 1 514 731 6951 x 123
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Kielotie 5 B
Vantaa 01300
Finland
Contact: Mr Hannu Korttesmaa
Job Title: Marketing Manager
T: + 358 10 3464 204
F: + 358 01 3464 200
E: hannu.korttesmaa@suomenviljava.fi
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Portugal
Contact: Mr Artur Rocha
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F: + 351 212 946 228
E: mail@supercargo.pt
W: www.supercargo.pt

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315 East State Highway 28
PO Box 684
Morris
Minnesota 56267
USA
Contact: Mr Corey Poppe
Job Title: Marketing Manager
T: + 1 320 589 2406
F: + 1 320 585 5644
E: info@superior-ind.com
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Jernbanevej 9
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Denmark
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Poligono Industrial La Cartuja
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Spain
Contact: Mr Simon Whalley
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Contact: Dr Holger Lieberwirth
Job Title: Executive Vice President
T: + 49 341 2423943
F: + 49 341 2423610
E: sales@takraf.com
W: www.takraf.com
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Delfweg 18
Noordwijkerhout
NL-2211 VM
The Netherlands
Contact: Mr E A J Houben
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F: + 31 252 37 54 68
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Postbus 433
Deventer 7400 AK
The Netherlands
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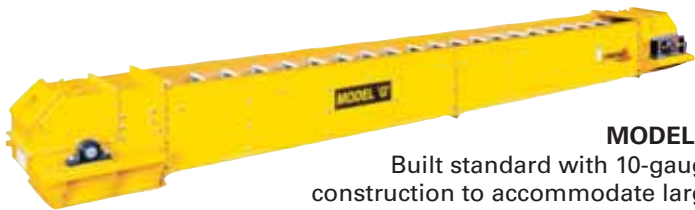
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Haslev DK-4690
Denmark
Contact: Mr Anders Larsen
Job Title: CEO
T: + 45 56314925
F: + 45 56314555
E: sales@techNaero.dk
W: www.techNaero.dk
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Omagh
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BT79 ONZ
Northern Ireland
Contact: Miss Samantha Gant
Job Title: Marketing Co-Ordinator
T: + 44 28 82 25 11 00
F: + 44 28 82 25 22 11
E: samantha@telestack.com
W: www.telestack.com
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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
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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
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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-nh@thyssenkrupp.com
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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
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Maaswijkweg 7
Spijkenisse
3203 LG
The Netherlands
Contact: Mr Rik Verspeek
Job Title: Business Manager
T: + 31 181 668668
F: + 31 181 668660
E: info@tideworks.com
W: www.tideworks.com

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Industrivägen 12
Falkenberg
S-311 33
Sweden
Contact: Mr Peter Stenbeck
T: + 46 346 82100
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E: info@timars.se
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Bernardino Silveira Pastoriza, 710
Bairro Sarandi
Porto Alegre
RS
91160-310
Brazil
Contact: Mr Zutimisa Gorete
Job Title: Marketing
T: + 55 51 2131 3332
F: + 55 51 2131 3330
E: marketing@tmsa.ind.br
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Hull Road
Hull HU12 8DZ
UK
Contact: Mr Gus Walker

Job Title: General Manager
T: + 44 1482 782 666/+44 7813 800251
F: + 44 1482 793 920
E: gus@tramcoeuropa.karoo.co.uk
W: www.tramcoinc.com

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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
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Contact: Mr John Wellington
Job Title: Managing Director
T: + 63 47 252 6332/4/5
F: + 63 47 252 6336
E: translift@transliftsubic.com

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10 Didak St
Amprior
Ontario K7S 0C3
Canada
Contact: Mr Glenn Kohut
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Contact: Mr Steve Maxwell
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F: + 61 2 4968 2043
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
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18th Floor
3255 Zhou Jia Zui Road
Shanghai
200093
China
Contact: Mr Lian Zhou Yang
Job Title: Business Development Manager
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 37197
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

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Lytellton
Gauteng
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Contact: Mr Paul Kuiper
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F: + 31 524 599 330
E: mach@veenstra-coevorden.nl
W: www.veenstra-coevorden.nl

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Nieuwegein
3430 BA
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Contact: Mr Eric Visser
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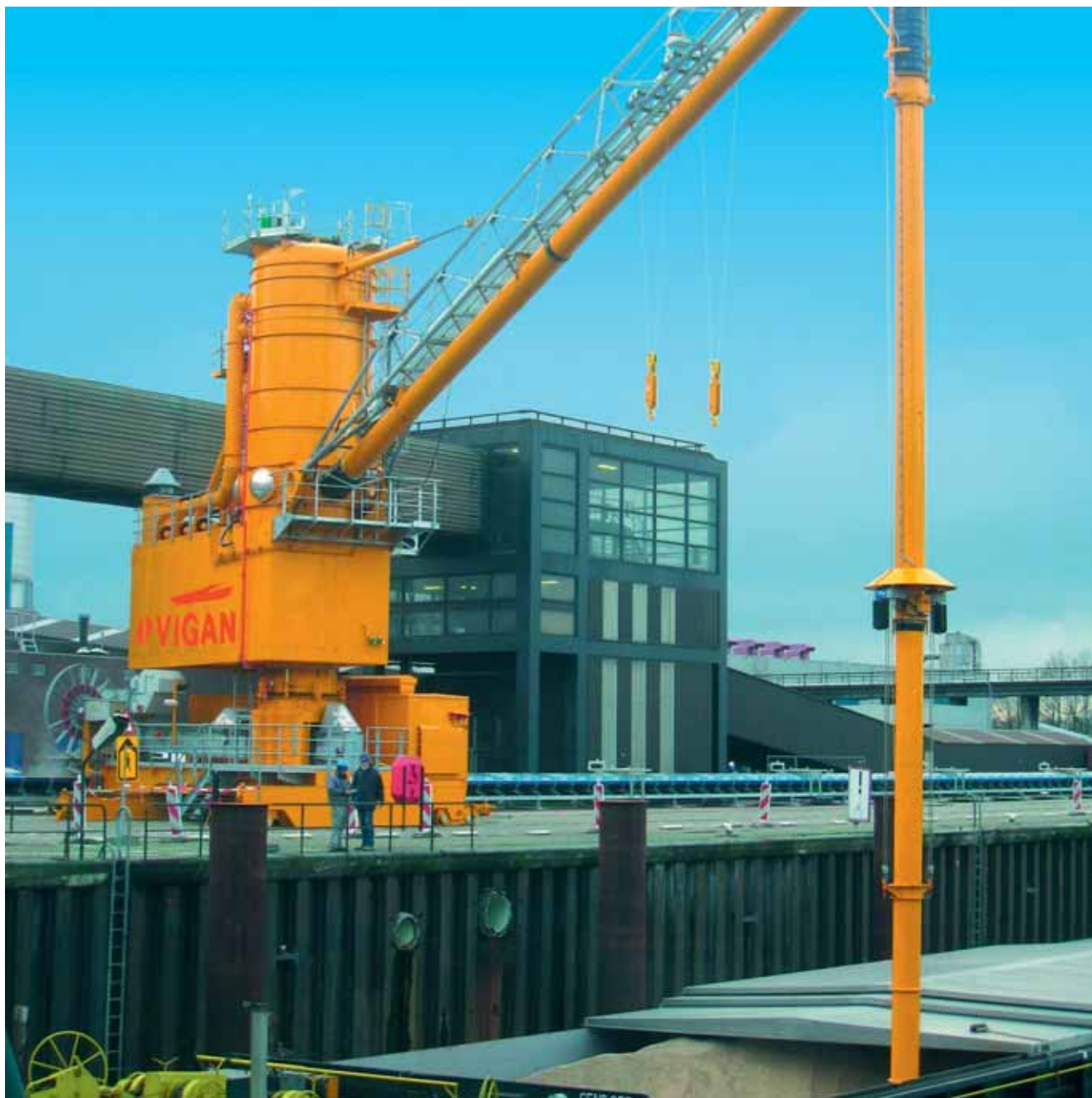
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Contact: Mr Jean-Claude Poncet
Job Title: President
T: + 33 3 85 44 06 78
F: + 33 3 85 44 06 79
E: jc.poncet@vibrafloor.com
W: www.silexport.com

VIGAN



Rue de L'Industrie 16
Nivelles
B-1400
Belgium
Contact: Mr Nicolas Dechamps
Job Title: Managing Director
T: + 32 67 89 50 41
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" conditions.

WEBSTER GRIFFIN LTD

Brooklands Park
Farningham Road
Crowborough
East Sussex
TN6 2JD
UK
Contact: Mr Mark Wilson
Job Title: Managing Director
T: + 44 1892 664250
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/
Windmüller & 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.

Company	Ship & Barge Loaders	Pneumatic Ship & Barge Unloaders	Mechanical Ship & Barge Unloaders	Conveyors	FIBC, Bags & Bag Handling	Hoppers	Grabs	Dust Suppression	Sampling & Inspection	Weighing & Measuring	Grading & Sifting	Truck Loaders & Unloaders	Railcar Loaders & Unloaders	Storage Systems	Engineering Consultants	Other
Cavotec SA																
CDM Systems, Inc																
Cesur Packaging Corporation																
CFS srl																
Chief Industries UK Ltd.																
China Huadian Engineering Co., Ltd.(CHEC)																
China Sonangol International (S) Pte Ltd																
Christianson Systems Inc.																
Chronos BTH																
Chronos BTH GmbH																
Cimbria Bulk Equipment																
Clariant Corporation																
Claudius Peters Technologies S.A.S																
Cleveland Cascades Ltd																
COBRA Europe SA																
Cofely Experts BV																
Condepois																
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																
DCL, Incorporated																
De Regt Conveyor Systems																
Dearborn MidWest Conveyor Co.																
Demag Cranes & Components GmbH																
DeMarco Industrial Vacuum Corporation																
Dinissen BV																
DMN-WESTINGHOUSE																
Dome Corp of North America																
Dome Technology																
DOMTEC International LLC																
Donaldson Filtration Deutschland GmbH																
Doosan Benelux SA																
D vos Santos International, LLC																
DSH Systems Ltd.																
Dust Control Technology																

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Dust Solutions Inc.	✓		✓				✓									
E-Crane World Wide																
E-Crane World Wide / E-Crane International USA	✓		✓				✓									✓
ECS Eurocargo Services AS																
Elgin Engineering and Construction																
EMS-TECH Inc			✓				✓								✓	
Enclosed Bulk Systems BV																
Enco Engineering Inc															✓	
Endress + Hauser Inc										✓					✓	
Engicon nv																
EQUIPO LLC																
ESI Eurosilio BV																
Euromec Srl																
Eurotech Corporation																
Euro-Tranco BV																
FAM Foerderanlagen Magdeburg																
Figeo Crane Services BV																
Flexco																
Flexveyor 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																
Gerdlinger GmbH & Co KG																
Goffetto Sangati Srl.																
Goodman Conveyor Company																
Goodtech Solutions AS																
Gortwald Port Technology GmbH																
Greystones Cargo Systems (Pty) Ltd																
Gulsan Ap.																
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																

	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																
Inspectorate America Corporation																
Inspectorate International Ltd																
Interbulk Enterprise																
Interjute BV																
Intersystems																
Iatgru S.r.l																
J & B Grabs b.v.																
Jem International & Express Scale Parts																
Jenlike & Johanson Inc.																
Jim Way Enterprise Co Ltd																
Joy Mining Machinery																
Kardesler Grab & Machine																
Kinergy Corporation																
King Bag & Manufacturing Co																
KIROW ARDELT GmbH																
Kranunion																
Laidig Systems Inc																
Langston Companies Inc.																
Larox Flowsys Oy																
Lawrence Industries, Inc.																
Libran Engineering and Services																
Librawerk Maschinenfabrik GmbH																
Liebherr-Werk Nenzing GmbH																
Listenow GmbH & Co.																
LogSys NV																
Macawber Engineering, Inc																
Mack Manufacturing Inc																
Maquinas Condor SA																
Martin Engineering																
Martin Engineering GmbH																
Martin Engineering South Africa																
Maschinen und Mühlenbau Erhard Muhr GmbH																
Merrick Industries																
Mieso Minerals Industries, Inc.																
Midwest International Standard Products, Inc.																
Mole+Master Services Corporation™																
MRS Greifer GmbH																
Mühlen Sohn GmbH & Co. KG																
Müller Beltex BV																
NAVCO (National Air Vibrator Co)																
Nectar Group Ltd																

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Salzgitter Maschinenbau AG/PEINER Grabs	✓						✓									
SAMSON Materials Handling Ltd																
Sartorius Mechatronics T&H GmbH																
Schenck Process UK Limited		✓														
Schenck Process UK Ltd T/A Redler																
Schouten Commodities BV																
Scorpio Engineering Pvt. Ltd	✓															
Seabulk Systems Inc																
S-E-G Instrument AB																
Sempertrans France Belting Technology SAS																
SENNEBOGEN Maschinenfabrik GmbH	✓															
Servo Berkel Prior																
SEW-EURODRIVE GmbH & Co KG																
SGH Equipment Limited																
SGS																
SGS (Nederland) BV																
SGS Australia Pty Ltd																
SGS Austria Control-Co GmbH																
SGS Minerals Services																
Shanghai Global Machinery Co., Ltd (SGMC)																
Shanghai Qitan Co., Ltd.	✓															
Shanghai Zhenhua Port Machinery Co (ZPMC) Ltd	✓															
Shanhi International																
SIBRE (Siegerland Bremsen)																
Sivertell — a Cargotec brand	✓															
SMB International GmbH	✓															
Sobemai by IRI nv	✓															
Solimar Pneumatics																
Sotecma Inc Process Engineers																
Spencer																
STAG AG																
Stas BV																
Stewart Inspection and Analysis (Pty) Ltd																
Strudes Inc																
Sub Con Ltd																
Suomen Viljava Oy																
Supercargo, Lda																
Superior Industries	✓															
Svendborg Brakes A/S	✓															
Swire CTM Bulk Logistics																
TAIN WESER, S.A.	✓															



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TAKRAF GmbH	✓	✓	✓	✓	✓											
TBMA Europe BV	✓	✓	✓	✓	✓											
Tebodin Consultants & Engineers																
techNaero aps																
Telesack Limited	✓															
Teca Mühendislik A. .		✓	✓	✓	✓											
The Grab Specialist b.v.							✓									
Thermo Fisher Scientific																
ThyssenKrupp Canada	✓	✓	✓	✓												
ThyssenKrupp Resource Technologies GmbH	✓	✓	✓	✓												
ThyssenKrupp Robbins, Inc.	✓	✓	✓	✓												
Tideworks Technology - Europe																
Timars Svets & Smide AB																
TMSA Tecnologia em Movimentação S/A	✓	✓	✓	✓			✓									
Tranco Europe Limited	✓	✓	✓	✓												
Tranco, 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.	✓															
Verstegen Grijpers BV																
Vibratfloor																
Vigan																
Webster Griffin Ltd	✓	✓	✓	✓												
Wieland Lufttechnik GmbH																
Windmüller & Hölscher KG	✓															
Worley Parsons Canada (Westmar)	✓	✓	✓	✓												

Dust Free Pneumatic Ship & Barge Unloading



- Grain
- Soybeans
- Small Seeds
- Corn
- Wheat
- Palm Kernel
- Barley
- Meal
- Urea

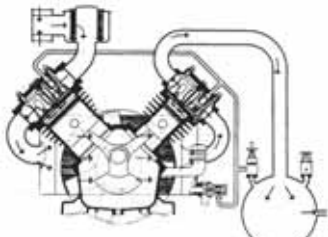
**Ship and Barge
Unloading
150-600 MTPH**



Christianson Systems offers flexible solutions for a wide range of material handling applications. State-of-the-art technology backed by over 50 years of experience assure that each machine is built with superior quality, construction, and design. Equipment recommendations are based on the customer's product, vessel size, capacity requirements, and power sources. By making the right choice, the customer will make the most of his money!



Christianson Systems, Inc.
20421 - 15th Street SE
PO Box 138
Blomkest, Minnesota 56216 USA
+1-320-995-6141 Telephone
sales@christianson.com



Piston Compressor (<1800)



Roots Blower (1900)



Fan with Air Flow Regulator (1960)



Fan with frequency inverter and automatic belt tension (2000)



TURBO POWER single stage (2009)



TURBO POWER double stage (2011)

MULTIPOINT SHIPUNLOADERS ADVANTAGE

- RELIABLE
- LOWEST POWER CONSUMPTION
- EFFICIENT
- 100% BLOWER DIRECT DRIVE - No V-Belts, No cardan joints, No bearing blocks...

With TURBO POWER Direct Drive (single or double) on the motor shaft. With temperature and vibration bearing monitoring control (upper right picture).