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A flat outlook for grain trade?

Commodity import demand in a number of countries evidently is being reinforced by positive influences. These are assisting growth in global seaborne dry bulk trade, with indications pointing to a possible acceleration in 2017 as a whole, compared with last year. However, there is still uncertainty about aspects of second half expansion.

The latest economic outlook prepared by the OECD organization, published last month, highlighted signs of improvement in the global economy beginning to appear. A modest pickup in the world's GDP growth rate this year now seems achievable, from 3.0% in 2016, to 3.5%. World trade volume is forecast to grow by 4.6% in 2017, almost double last year's sluggish rate.

Grain

In the grains sector (wheat, corn and other coarse grains) International Grains Council estimates suggest that global trade may be marginally lower at 349mt (million tonnes), during the new 2017/18 crop year starting this month. Previously a small 5mt or 1% estimated rise to 351mt occurred in 2016/17 which has just ended, as shown in table 1. The outlook may change when summer harvests in northern hemisphere importing countries have been completed.

Sizeable increases in grain import demand are not a prominent feature at present. In the past twelve months, higher imports into India, Mexico and Brazil (wheat) were the main additions. A restraining element probably continuing in the period ahead is a downwards trend in China's imports, especially feedgrains, reflecting government policy designed to reduce excessive corn stocks. Also, India's imports which were unusually high in 2016/17 are likely to diminish because of a better domestic harvest.

Iron ore

Higher steel production in a number of countries is benefiting raw materials trade. Improving economic growth momentum is apparently reflecting partly a greater contribution from investment spending, much of which incorporates steel. Stronger public infrastructure investment in Asian countries supports this trend.

China's monthly iron ore imports averaged 89mt in the first five months of 2017, after an average 85.4mt through last year. The strengthening trend indicates that the annual figure will be much higher this year, but there are uncertainties about future performance. Other importers currently expected to see annual increases include Japan, the European Union, and several smaller buyers.

Coal

Seaborne coal trade now appears to be set for a solid increase in 2017 which, if achieved, will be a notable reversal of the trend following two down years. But this year's second half is still difficult to predict, especially as China's imports could be greatly affected by changes in official policy as well as commercial decisions.

In another key importing country, India, coal imports could continue declining. Last year saw a 10% reduction to just below 200mt, amid increased output from domestic Indian coal mines. These are expected to expand production again. While demand for power remains strong as the economy grows rapidly, other energy sources are contributing additional electricity supplies.

Minor bulks

Fertilizers in raw or processed forms comprise a large part of the minor bulks trade group. Shipments of phosphate rock, sulphur, potash, urea and manufactured fertilizers are estimated to have totalled over 150mt in 2016. Tentative signs of an increase in the current year have emerged, possibly raising the total by about 3–4%.

Bulk carrier fleet

In the Handysize (10-40,000 dwt) bulk carrier category, which comprises about 12% of the entire world fleet of all sizes, growth may accelerate slightly in 2017, as shown in table 2. This fleet has grown slowly in the past three years, averaging 1.4% annually. During the current twelve months, lower newbuilding deliveries accompanied by sharply reduced scrapping could raise the growth rate to over 2%.

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

	2012/13	2013/14	2014/15	2015/16	2016/17*	2016/17*
Asia (excluding Japan)	58.6	73.6	89.0	95.0	94.4	89.4
Japan	24.3	23.4	21.9	22.1	22.9	22.7
Middle East	48.4	54.0	56.7	55.8	55.7	58.3
Africa	56.3	65.3	67.1	76.2	76.0	74.8
Others	83.1	94.1	87.4	96.6	101.5	103.9
World total	**270.7**	**310.4**	**322.1**	**345.7**	**350.5**	**349.1**

*source: International Grains Council, 29 June 2017 *forecast July/June crop years*

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

	2012	2013	2014	2015	2016	2017*
Newbuilding deliveries	10.4	6.3	5.4	6.6	4.6	4.0
Scrapping (sales)	8.3	6.7	4.2	5.2	3.2	2.0
Losses	0.1	0.2	0.0	0.0	0.0	0.0
Plus/minus adjustments	0.5	0.0	–0.1	–0.1	0.0	0.0
World fleet at end of year	**90.9**	**90.3**	**91.4**	**92.7**	**94.0**	**96.0**
% change from previous year-end	+1.7	–0.7	+1.2	+1.5	+1.4	+2.1

*source: Clarksons (historical data) & Bulk Shipping Analysis 2017 forecast *forecast*

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Steel production pickup boosts raw materials trade

Cargoes of iron ore and coking coal — the main commodities required for steelmaking — became more numerous recently, responding to rising production of steel. In Asian and European countries seaborne raw materials imports for this industry have been boosted by a pickup in steel demand and output, contrasting with a generally weak trend last year.

A vigorous performance at China's steel mills has contributed to robust growth in iron ore and coking coal imports. These volumes comprise over two thirds and about one-seventh of global trade in the two categories respectively. But other countries in Asia, and also in Europe, also have seen stronger production trends benefiting raw materials usage.

Marching forwards

During the first five months of this year, rising steel output has been achieved in many countries. These increases reflect economic activity as a general driver, and progress in manufacturing industries and construction work using steel, as a more direct influence. Other aspects reflected in steel mills' activity are inventory changes, and steel products exports and imports flows.

Among the largest importers of raw materials, India (a major coking coal buyer) saw the biggest percentage steel production increase. The January–May 2017 crude steel production volume was 7.4% above the same period a year earlier, according to World Steel Association statistics, at 41.8mt (million tonnes). China recorded the second highest rise of 4.4% based on provisional figures, lifting the vast output to 346.8mt.

After a long period of weakness, European Union steel production rose by 4.1% to 71.7mt, although individual member country's experiences varied greatly. Germany and Italy increased volumes by about 2%, to 18.6mt and 10.3mt respectively. Much larger rises were seen in France, up by 11% to 6.6mt, and Poland where a 16% increase to 4.3mt occurred.

In Asia, Taiwan raised its crude steel production total in the same five months period by 3.6% to 9.3mt. Of more consequence for iron ore and coking coal trade volumes, Japan and South Korea both saw 2% increases in steel output, to 43.9mt in Japan and 28.4mt in Korea.

The giant's strides

China's seaborne imports of iron ore and coking coal totalled 1.04 billion tonnes in 2016, equivalent to almost two-thirds of world seaborne trade in the two commodities, based on Clarksons Research data. The upwards trend revived last year, mostly reflecting an acceleration of iron ore imports growth. Consequently there is again an immediate focus on this aspect of global minerals movements.

Optimism for another large increase in 2017 as a whole has been reinforced by rapid expansion in the past few months. Iron ore imports into China (the largest part of the country's raw materials total) rose by 32mt or 8% in the January–May period this year, reaching 445mt. But some analysts are not confident that such a strong growth rate can be maintained throughout the entire twelve months.

One uncertainty is the steel production trend. The government's economic stimulus measures introduced last year have benefited steel using industries over a longer period than expected. Recently, however, there have been signs that some tightening of policy is now under way, implying a restraining influence which could cause steel output to falter.

There are also questions about iron ore stocks at ports. These rose quickly by a fifth from the beginning of this year up to the end of May, reaching a reported 137mt, significantly contributing to growth in import demand. At that level, potential for reduction seems greater, which could also restrain imports during the second half.

Adverse influences, if these occur, could be offset at least partly. Greater substitution of iron ore produced by domestic mines in China, with foreign supplies, is still a valid expectation. But much depends on relative prices, and possibly also changes in government policy, neither of which are easily predictable.

Measured steps

What will happen elsewhere in the remainder of 2017? The strengthening steel production tendency in a number of countries could be maintained especially if, as seems likely, some economies continue gaining momentum.

The European Union has attracted attention because of the notable pickup in the region's steel industry since this year began. Even so, the latest European Steel Association quarterly report, which does not predict actual production volumes, was able to foresee only a marginal one percent rise in steel demand during 2017, although any improvement in the steel products trade picture might benefit output.

In Japan, South Korea and Taiwan positive signs have emerged but these have not yet pointed to more than limited steel production increases this year. The main exception, among the large producers, is India where vigorous economic progress is clearly buoying steel demand.

Additional imports of iron ore and coking coal into these countries seem likely to have a positive effect on global seaborne trade volumes this year. Some forecasts also show extra purchases by a range of smaller buyers, such as iron ore into Oman (8mt last year) and coking coal into Brazil (15mt last year). The principal doubts, as already expressed, surround China's trend: slowing domestic steel demand remains a possibility, together with other restraints.

Richard Scott

CRUDE STEEL PRODUCTION (MILLION TONNES)

Key raw materials importing countries

	2012	2013	2014	2015	2016	% change*
China	731.0	815.4	822.8	798.8	808.4	+1.2
Japan	107.2	110.6	110.7	105.1	104.8	-0.3
EU -28 group	168.6	166.3	169.3	166.2	162.0	-2.5
South Korea	69.1	66.1	71.5	69.7	68.6	-1.6
Taiwan	20.7	22.3	23.1	21.4	21.8	+1.9
total	1,096.6	1,180.7	1,197.4	1,161.2	1,165.6	+0.4

source: World Steel Association *** % change 2016, compared with 2015*

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Bauxite and alumina

capacity cuts needed to ensure trade balance and boost prices

Chinese government recognizes overcapacity issues and environmental concerns

China has been for long remained at the receiving end of global criticism for unrestrained exports of steel and aluminium and causing environmental injuries, *writes Kunal Bose*. The latter because of the country allowing the functioning of power guzzling ageing steel mills, aluminium smelters and alumina refineries in unrestrained ways. This is causing price distorting global surpluses. In both aluminium and steel, the world's second-largest economy has half the share of world production. But unlike aluminium smelters in Canada, Europe and the Middle East using hydro or gas-based energy, the ones in China are fed with coal-fired electricity and, therefore, the industry there leave a big carbon footprint to the annoyance of the rest of the world.

Beijing is, however, no longer inured to world criticism of its industrial actions. The country's president Xi Jinping inspires confidence as a reformer. Among his topmost priorities are elimination of corruption and ridding principal industries such as steel, aluminium and coal of polluting capacity in phases. Capacity elimination was attempted by the central government in the past too, ahead of Xi coming to occupy the president's office. But all that was largely frustrated because of machinations of bureaucrats and party officials at provinces.

In pushing through the crusade, Xi has the advantage that his writ runs firmly over both the communist party and the government. To the pleasant surprise of the rest of the world, China's steel capacity elimination in 2016 was ahead of target. It now looks entirely possible that the targeted 150mt (million tonne) scrapping of undesirable steel capacity by 2020 will be achieved. Encouraging progress in decommissioning of coal capacity is also being made.

But what about aluminium, on which China is up for a major scrap with the US Administration? The Chinese government appears serious about forcing smelters to cut production during the winter beginning November and running up to March end. If pushed through, the move will potentially cut aluminium output by up to 1.5mt Aluminium prices got a leg up in the wake of China saying the smelters in four provinces surrounding Beijing would be required to slash production by as much as 30% during the winter heating season to support a campaign to fight smog and pollution.

At a recent industry conference in London, Lu Dongliang, a senior vice president at Chalco, China's largest producer of aluminium, said the government was also earnest about coming down heavily on illegal smelters that could affect capacity ranging from 3mt to 8mt. It is, however, left to conjecture how much production will actually get killed by the proposed campaign. Giving an insight into possible aluminium industry restructuring

following the government crackdown, Lu said there could well be a shift in smelting capacity from heavily populated areas to western China. "We already have some enterprises thinking of shifting capacity to western China where costs will be lower. But to what extent this happens remains to be seen," said Lu.

But as hopefully production gets a cut during the winter and some capacity permanently eliminated, new capacity in excess of 3mt is said to be in the pipeline in China. Lu said Chinese aluminium capacity would climb to 45mt by 2020. He also said the use of aluminium would rise 7–10% in 2017 and 2018. According to a London-based analyst, even after all the talks about production discipline Chinese aluminium output in 2017 is heading for a rise of 7.9% to 34.4mt. Demand improvement in China will reduce surplus aluminium that brings pressure on the country to export, allegedly by breaching trade rules of the World Trade Organization. Excluding China the world remains either in balance or deficit in the metal. Whatever Beijing may be saying, worries remain about reduced capacity in China. But operators more often than not have the tendency to hang on to signals appearing positive. Vivian Lloyd, analyst at investment banker Macquarie says: "We have always been biased towards China capacity cuts story, but near term there's loads of aluminium hanging around. There has been a big rise in Chinese exports." What then naturally follows is falls in premiums to be paid on physical delivery. Premiums seen as an accurate measure of primary aluminium metal supply at a particular point vary from market to market. In a way, premiums reflect the competition between suppliers to get maximum prices and buyers the opposite.

The last five years have seen aluminium makers in Europe and North America dismantling smelters in attempts to cut surplus and boost prices. Industry leaders such as Rusal of Russia, Alcoa of the US and the Norwegian Norsk Hydro have all participated in cutting of capacity. That and also rising protests by smelting groups in the US, European Union and India about China's predatory export pricing and skulduggery involved in faking primary aluminium as semis have built up pressure on Beijing to finally start talking seriously about production discipline. CEO of India's Vedanta Aluminium Abhijit Pati says: "Even while the country's aluminium use is growing nicely, imports mainly originating in China and the Middle East are meeting over half the local demand for the metal. As a result, a good portion of the Indian smelting capacity has remained idle."

The export focus of Chinese smelters has shifted to semis (at least to make aluminium appear like that) as there is a 15% tax on primary aluminium. Beijing offers a 13% rebate on exports such as flat rolled products and tubes and pipes. Foils receive a 15% rebate. Like it has started doing in the case of steel where China has half the share of global overcapacity of around 700mt, the country should ideally encourage consolidation of smelter capacity as production cuts are announced to be made. Baowu Steel Group that in the closing days of last year emerged as the world's second largest steelmaker after ArcelorMittal following the merger of Baosteel and Wuhan Iron & Steel is undertaking multiple market-based reforms, including eliminating uneconomic and polluting capacity. The merged entity has also announced to be in the forefront of steel technology innovation.

What Baosteel before merger was to Chinese steel industry, Aluminium Corporation of China, commonly known as Chinalco is to aluminium industry of the country. Chinalco and China's second-largest aluminium entity China Hongqiao will have to be in the forefront of capacity consolidation that invariably leads to ejecting uneconomic capacity, overall production efficiency improvement and cost saving. Aluminium has been among the best-performing industrial metals this year with its prices climbing from a low of $1,450 in late 2015 to close to $1,900 a tonne. Price improvements of the present kind allowing profitable smelter operation does not, however, create ideal condition for mergers and capacity consolidation. If anything, taking advantage of good prices, high cost 'swing' smelters tend to return to production. That once again sets in motion supply surge posing a risk to prices. In China where the government writ runs over business, the fate of consolidation will depend entirely on Beijing's stance.

In the meantime, driven by the virtues of consolidation and ownership in downstream value added extruded products, Norsk is buying the 50% of Sapa that it does not already own in a cash deal that gives the latter an enterprise value $3.2bn. Sapa, an equal ownership joint venture between Norsk and the Norwegian consumer goods supplier Orkla, is seen as global leader in aluminium extrusions, which find major application in automobile and construction. Norsk says the merger to be completed in the current half of 2017 will yield synergistic benefits of $42m a year. In a comment on the merger, Norsk chief executive Svein Richard Brandtzaeg says: "[Whole ownership of] Sapa will enable us to assume global leadership, establish a platform for growth, and provide responsible operations and sustainable solutions for the future low-carbon economy."

In the first quarter of 2017, Sapa had operating margins of 5.5%. But Norsk believes margins of Sapa operations for the year will be double that. Lex in the *Financial Times* says: "Norsk will need to spin a better tale on cost savings to justify buying Sapa at this point in economic cycle." But mergers are attempted for deriving value over short, medium and long-term through economic cycles and substantial synergistic benefits. Take Indian aluminium group Hindalco's $6bn buy of Novelis, the Canadian group specializing in value-added products finding application in automobile to packaging to construction and metal recycling, in 2007. Businesses of both Hindalco and Novelis have taken some major leaps since.

Great times are awaiting aluminium application in automobile as electric and hybrid cars are to cut a big profile in the automobile industry. Moreover, as governments in developed and emerging economies enforce increasingly demanding emission norms, vehicle weight reduction will lead to growing replacement of steel by much lighter aluminium. From luxury carmakers such as Mercedes, Audi and Land Rover Jaguar to mass market vehicles like Ford 150 pickup truck, aluminium is ruling the roost. Aluminium's popularity with original equipment manufacturers for automakers rests on the tripod of light weight leading to better fuel economy for vehicles, good formability and high strength.

But isn't a cloud hanging over aluminium and also steel as the US repeats the threat to invoke section 232 of a national security law passed in 1962 at the height of Cold War? The invocation can be made only when imports of goods are seen to be compromising national security. In this particular instance, the threat appears to be one way of pandering to the 'America first' groups of Donald Trump support base. Against the US trade sabre rattling is to be considered representations to WTO Goods Council by China and the European Union that section 232 tariffs would not find justification on national security grounds.

The thesis of commerce secretary Wilbur Ross is based on the premise that under pressure from imports, particularly from

Car manufacturers, including Jaguar, are increasingly using aluminium in body construction.

China but also from Russia and the EU, the American smelting industry has been reduced to a single entity Century Aluminium that is capable of making aerospace grade high quality aluminium alloy required for making combat aircraft. As his argument goes, the domestic producer is perhaps able to meet peacetime needs for aluminium alloys required in producing armour plating for military vehicles, naval vessels and combat aircraft. But the US will be vulnerable to shortages in the event of conflicts.

At a White House briefing, Ross said: "At the very same time that our military is in need of more and more of the very high quality aluminium, we're producing less and less of everything, and only have the one producer of aerospace-quality aluminium." The wide ranging investigation of imports by the US Administration will cover to what extent the country's domestic aluminium industry is in a state to meet the defence requirements in conflict times and the effects of job, skills and investment loss on national security.

No doubt like in the US, aluminium producers in India and Europe have borne the brunt of low priced imports from China where bloated capacity has led to supply excesses over a long time. Reacting to the US trade salvoes, a senior Chinese industry official said: "Aluminium products imported from China are general products with civilian uses such as packing, roofing, road signs and consumer durables. None of these products has any bearing on national security." In any case, as the official pointed out aluminium required for US national defence is less than 2% of total domestic consumption.

China is largely responsible for global aluminium overcapacity. But capacity created in recent times in the Middle East and India is also to be accounted for. Weaknesses in global economic growth impinging on demand till recently have also contributed to capacity overhang. In contrast to overbearing tone of US officials that all ills of domestic smelting industry are because of imports, three senior officials from Alcoa, Rio Tinto and Arconic Inc. have been judicious enough to recommend that a solution is to be found through engagement with China so that its surplus production stops hurting others. Unilateral trade actions will not be found conducive to solving the problems of the global aluminium industry.

Concerned about the fallout of unilateral actions by the US, more and more industry officials are suggesting that Washington should make a deal with the world's biggest producer to find a solution to excess imports. Rio Tinto Aluminium CEO Alf Barrios observed: "I must say the recent statements from the Chinese government recognize the oversupply and offer some hope, I believe, the best outcome is a negotiated solution."

No end in sight for profound crisis in Brazil's aluminium industry

There is no sign of an end to the deep crisis affecting the aluminium industry in Brazil, where the output of primary aluminium has fallen by 30% in the past three years, and where *per capita* consumption of the metal has fallen from about 7kg a year, to just over 6kg in the same timeframe, *writes Patrick Knight.*

At the request of the government, the industry trade association, ABAL, has prepared a comprehensive study entitled 'Aluminium in Brazil until 2030'. But with the deep political crisis which has seen the impeachment of one president, and could easily result in the present incumbent, Michel Temer, also being forced to step down, the government has more urgent things to worry about than aluminium. Fortunately, demand for the bauxite and alumina of which Brazil exports large quantities continues strong, so the companies producing this are partly insulated from the problems. But the industry is almost entirely vertically integrated these days, so the weak demand for processed aluminium, consumption of which has fallen from 1.5mt (million tonnes) to 1.2mt a year in the past four years, affects everybody. Worst hit has been the construction industry, responsible for about 20% of all the aluminium consumed; the motor, and consumer durables have also been hit hard. Packaging, responsible for more than a third of what is consumed, has been hit less hard, although demand for canned drinks has slowed.

Now that Vale is no longer active in any part of the production chain, following the sale of its bauxite and alumina interests to Norsk Hydro, the most important Brazilian-owned company in the industry, the Brazilian-owned Brazilian Aluminium Company, CBA, part of the massive Votorantim group, is being very hard hit. For several decades, this company systematically increased production of primary aluminium at its plants in Sao Paulo state each year. At the peak, CBA was producing more than 440,000 tonnes, all made from bauxite produced at its mines in neighbouring states, with smelters powered mainly by electricity produced by CBA at the numerous small and medium-sized hydro-electric plants it owns in the vicinity of its

mill. CBA also invested heavily in extruded products, mostly catering for Brazil's buoyant construction industry which takes 15% of the total produced. But following the fall in demand, and the lack of competitiveness of Brazilian aluminium, which has allowed imports to increase, CBA is now making only about 290,000 tonnes of primary aluminium a year, 60% of its primarily smelting capacity, while only 30% of its extrusion capacity is being used. In contrast to Alcoa and Norsk, CBA has never been a major exporter of alumina or bauxite. Its output of alumina has fallen from 792,000 tonnes in 2013, to 650,000 tonnes in 2016, while the company's output of bauxite has fallen from 2.9mt in 2013, to 1.8mt last year. Vale's bauxite reserves in Minas Gerais state are of lower quality to that used by everybody else, and although Vale has a share in the MRN bauxite deposits in Amazonia, these are far from Sao Paulo.

As some new capacity has come on stream, the amount of alumina produced in Brazil has increased from 9.9mt in 2013, to 10.5mt last year, with exports increasing from 7.1mt in 2013, to 8.3mt last year, while total output of bauxite has increased from 34mt in 2013, to 38mt in 2016. The amount of bauxite exported increased from 8,4mt in 2013, to 9.6mt last year. Output at the MRN mines at Trombetas has risen from 17.3 to 18mt, that of Norsk, has grown from 7.6mt in 2013, to 11mt last year.

It is anticipated that the Brazilian economy will grow by about 0.5% this year, after falling by more than 3% in the past couple of years. Because a huge stock of completed or partly completed apartments and offices remain unsold, output by the construction industry has fallen by more than 20% in the past few years and there is little hope for much of a recovery soon. After sharp falls in the number of new cars and trucks sold, the market for vehicles seems to have stabilized, partly because the weaker currency has made Brazilian models more competitive, so more are being exported. Because of the country's now chronic political instability, the government has had great difficulty in tackling problems such as pensions and wage levels, which have soared in recent years, while unemployment remains at high levels, so consumer confidence is low.

Brazil's modern aluminium industry can be traced back to the early 1970s, when the military-led governments which ruled Brazil at that time, and who were adepts of long term planning, drew up an integrated model for the aluminium industry. The foundation stones were the abundant supplies of high quality bauxite, found conveniently close to navigable rivers in the Amazon region, and the fact that several very large rivers have the potential to generate large quantities of hydro-electricity from some of the world's largest power plants. This period saw the building of the Alunorte alumina plant close to the city of Belem, to be fed by bauxite ferried from the MRN mines on the Trombetas river and of the Albras aluminium smelter near Sao Luis, as well as the Tucurui power plant.

The companies attracted to the schemes, notably Alcoa and Vale, which at that time was still deeply involved in all stages of the aluminium complex, were given long-term guarantees that much of the 4,000MW potential of the Tucurui power station, built in deep jungle on the Tocantins river, would be available to them at a price which would ensure that aluminium made in Brazil would be competitive with that made anywhere in the world. Without cheap electricity, a low-cost aluminium industry is not possible.

This model has been severely questioned in subsequent years, by critics who suggest that the money used to establish aluminium in the Amazon region, where costs are always above average, would have been better spent on measures aimed at reducing the growing disparity between rich and poor in Brazil. Critics claim that the high financial cost of such projects , and other grandiose infrastructure projects in the Amazon region, such as the Transamazonica highway and the North South railway. The revenues earned from the export of bauxite, alumina and primary aluminium, have not been sufficient to repay the high cost of establishing the aluminium complex, most of it borrowed from abroad

But it is easy to criticize with hindsight, and the abundant supply of aluminium in Brazil helped the country establish a modern aircraft industry, now the world's third largest, the canning industry and the increased use of aluminium fittings in modern buildings.

In the past 15 years, of course, the guarantees of low cost electricity for making primary aluminium have long run out, while the priority of recent left leaning governments has indeed been to attempt to reduce the disparity between rich and poor, not least by cutting the cost of electricity. But Brazil has unfortunately been hit by several years of below average rainfall. Coupled with inadequate investment in new, lower-cost generating capacity, the needs of the aluminium industry have been badly neglected. A substantial amount of smelting capacity has been shut down in recent years, and for the time being at least , there is no sign of anybody wanting to invest in anything new. The political situation is so acute, and public discontent so severe, that it cannot be guaranteed that at the next elections, Brazil may once again elect a left-leaning president, for whom aluminium would not be a priority. DCi

Bauxite.

The 'Pasha Bulker' ten years on – an insider's account

Reflection on the grounded coal ship, 'Pasha Bulker' ten years on. By Matthew Watson

08.30am, 8 June, 2007

The worst of the unforgettable storm that pulverized Newcastle [Australia] seemed over but news about a coal ship about to beach off Newcastle's Nobby's Beach meant it had really just begun. Gripping eyewitness accounts of the ship sliding her way onto Newcastle's doorstep were all over the radio as I headed to the beach through crowds of onlookers.

I phoned Anders Egehus, the Australia Managing Director of Svitzer, "Get ready for a media onslaught if you're chosen to handle the salvage response," I said. It would be quite a ride given that the spectacle was there for any camera to pick up.

With my ex-journo juices flowing, I also called the Chief of Staff desk at *National Nine News* in Sydney where I'd been an on-road reporter for many years. The legendary reporter Peter Harvey happened to pick up, "Yes Matty," he said in his assuasive tuba-voice, "the chopper's on its way.... Can you see the ship?" Pete asked as I got closer to Nobby's Beach. I looked through the windscreen at the foamy puffs of water lashing high over the deck.

"Oh, can I what…"

The hull of the 40,000 tonne *Pasha Bulker* was strikingly red. A garish lipstick-coloured lump with white accommodation quarters jutting from the stern like high-density home units — in the middle of Newcastle's main beach.

The Westpac helicopter had rescued all crew from the vessel and, with forecasts that the weather would ease, the *Pasha Bulker* appeared to be firmly grounded — for now.

Anders and I went into the boardroom of Svitzer's Newcastle tug base where I met Drew Shannon, who was handling shore-side logistics. Drew warned that a re-float attempt might or might not work. Any attempt would be time-consuming — weeks, months maybe. Equipment and personnel would come from across the globe. You didn't just press a few buttons in such situations and see the beached ship off.

It was agreed that Gary Webb, Newcastle Port Corporation CEO, and his media team would continue briefing journalists and providing all-important visuals such as oil booms being placed on the beach. I'd handle media enquiries on behalf of Svitzer. Naturally we'd have to work closely and be on the same page in terms of facts and developments, especially in an environment where things could change frequently.

One of the largest industrial helicopters in Australia was secured to transport salvage equipment onto the *Pasha Bulker*. It pulsated back and forth from a water-side equipment assembly zone at Carrington. A 'super-tug' anchor handling barge sourced from Asia was steaming for Newcastle. These were important visuals, to show the media and the community that things were happening. More salvage folks arrived from interstate and overseas — some 30 all up.

The wrinkling on the port-side of the hull gave away that the vessel was straining from the constant push of waves. The salvage team knew she would, in all likelihood, only hold up for so long. Yes, she might break up. A priority was pumping the on-board fuel oil off, yucky stuff that would leave a hell of a mess if it ended up on the beach or coast.

With every passing day, the media became hungrier for something new. The journos wanted an expert from the ship. And so, nearly two weeks after the grounding, it was decided to wheel out Drew Shannon. Drew's first media performance — after multiple practice sessions — was all but flawless. Not bad for a guy with no prior interview

experience asked to stand in front of a global media pack. He was straight-talking, no-nonsense and sure-footed. He exuded professionalism, honestly and credibility. The media warmed to him and this was instrumental in forming an indelible impression with the public.

Drew basically said, "We can't promise a good outcome, but we've got the best people and the best possible plan in play. We're doing our best folks…." It bought time and reduced pressure when the media may have gone for the jugular.

The first re-float attempt on the evening of 28 June failed due to a snapping tug cable, scepticism amongst the journalists lifted after the second attempt failed.

A comical moment unfolded when Gary Webb, Minister Tripodi, their staff and I trod down the headland track for the nightly media briefing. My mobile phone rang. It was Drew Shannon, on board the *Pasha Bulker*. "We might have oil in the water," he said.

"How much?" I asked, feeling my heart buck.

"Hard to tell. We can just smell oil. Might be nothing."

The media and public would crucify us if there was an oil spill and we'd said nothing about it. If it turned out there was no oil in the water, so what? False alarm. It just had to be clearly explained that identifying oil in the ocean at night is extremely difficult, so we wouldn't know what we were dealing with until sunrise.

And so, Minister Tripodi and Gary Webb stood before the camera lights piercing the night and calmly said, "well, there might be some… oil in the water." There were gasps. The journos went live on their phones and the TV link trucks cranked up. An "OIL SPILL!" it was quickly confirmed there was no oil (or a miniscule amount at worst). So, the good-news angle of the morning, bravo, was that there was no oil spill at Newcastle!

No one in the inner sanctum will forget the evening of 2 July. With the tide high and three tug boats roaring to pull the *Pasha Bulker* free, exasperation fell over the media pack on the headland. I sensed it was a tipping point, a moment where they'd attack. Gary Webb and Minister Tripodi had the unenviable task of fronting the cameras again. The questioning was pointed. Then, with the *Pasha Bulker* as the backdrop, a lone female voice simply said "…she's moving." Every set of eyes focused on the glowing *Pasha Bulker*.

"SHE'S MOVING!!"

And wasn't she just. Quickly. Literally flinging away from the beach. Someone said "Get out of the way!" and a confused-looking Minister Tripodi hobbled from his interview position so the cameras could get the money shot of the *Pasha Bulker* getting the hell out of there. There was clapping, cheering and hugging. Down in Newcastle car horns tooted. The *Pasha Bulker* was gone in a matter of moments, towed into the inky Pacific. The media conference resumed. "So, what was the secret of the success, Minister?"

"Well…. it was a flexible plan."

Everyone just laughed, including the Minister. There was "bad news", the ship's rudder was jammed in the rocks off the beach, meaning the re-float was only a 99% success. That created a few chuckles.

Some months later Drew Shannon visited my office in Sydney and handed over a palm-sized chunk of rusty steel as heavy as a brick. "A memento to say thanks for the professionalism." That unsightly piece of the *Pasha Bulker*'s rudder sits on my desk as I write this, ten years later.

Biography

Matthew Watson is Managing Director of Repute Communications and Associates and a former *Nine Network* journalist. He is one of Australia's foremost media and crisis management specialists. Matt is Navigate Response's network partner in Australia.

Industry recognition for Langh Tech's scrubber

The Langh Tech scrubber was recognized at the Baltic Sea Clean Forum in June.

In mid-June this year, the environmentally friendly scrubber from Langh Tech was recognized, as the EU-project based on the technology received the Baltic Sea Clean Maritime Award at the Baltic Sea Forum in Berlin. The third-place award was handed to Langh Group's Chairman of the Board, Maritime Counsellor Hans Langh by Professor Kurt Bodewig, European Coordinator Baltic-Adriatic.

The Forum was organized in connection with the EU Strategy for the Baltic Sea Region (EUSBSR) Annual Forum.

The Baltic Sea Clean Maritime Award is awarded to innovative and environmentally friendly solutions and ideas, which promote the well-being of the Baltic Sea. The project Back from Black – Study and deployment of the affordable scrubber retrofitting technology for SME shipowners, which is coordinated by Langh Group, received the acknowledgement in the Innovation and Science category.

The project has been funded by INEA (Innovation and Networks Executive Agency) from the CEF-programme (Connecting Europe Facility). The aim of the Back from Black project was to create, demonstrate, deploy and disseminate an economic and environmentally viable technology, which will help to comply to the sulphur regulations. The technology developed is a true hybrid scrubber, that can be used both in closed loop and open loop mode. It's a truly hybrid scrubber, since it can be operated also in closed loop mode without any time limits as the system has an efficient water treatment system for purifying the wash water.

Other partners in the project are Port of Helsinki, Hans Lehmann KG, Lehmann GmbH, Port of Teesport and Scrubber Tech Pikis. Besides the scrubber installations, the project also contributed to strengthening the port activities, it included a research about scrubber waste handling and the handling of the scrubber waste in the ports, that were in the project, was ensured.

Scrubber waste from efficient Langh Tech water treatment system.

The project has been successful as it has led to many commercial installations on cargo ships and cruise vessels.

The Baltic Sea Forum is a non-profit private organization that was founded by Martti Ahtisaari, the former Finnish President and Nobel Peace Prize laureate. The aim of the organization is to promote economic and cultural collaboration in the Baltic Sea region and to offer an independent platform and network for making it is easier to exchange experiences and ideas.

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UK P&I Club advises on ventilation to avoid cargo sweat

George Devereese of the Loss Prevention Department at UK P&I Club, comments on a number of claims received by the Club of damaged grain cargos due to cargo sweat and provides advice on the benefits of ventilation

"Cargo sweat can be caused primarily by either cargo heating up or from a vessel transiting from a warmer to cooler environment.

"If there is a temperature differential between the outside of the stow and the inside, moisture migration will result. Such moisture migration will also occur when one part of the bulk heats up for any particular reason, such as insect infestation, microbiological activity or proximity to a hot bulkhead. In all these circumstances, moisture will migrate from the warmer region to colder parts of the stow.

"Grain loaded warm and subjected to peripheral cooling will result in the primary moisture movement being in a vertical direction, so more water will pass towards the top of the cargo than towards the sides. If it is not possible to remove the water migrating to the top region of the cargo by ventilation, more damage may be anticipated in the top layers than at the sides.

"To counteract both these forms of cargo sweat, ventilation is the easiest remedy. For vessels fitted with natural or mechanical ventilation, the moist air may be continuously removed from the headspace above the cargo to reduce or eliminate condensation occurring on the deckhead.

"However, it must be remembered that the air used for ventilation is at the same temperature as, or below, the temperature of the deckhead and hatch covers. If the ventilating air is cool, the immediate effect will be to take up moisture vapour in the surface layers of the cargo, because of the vapour pressure.

"At the same time, the surface of the cargo will be cooled, both directly by contact with the cooler ventilating air and as a result of evaporation of moisture. Surface ventilation is also useful in cooling cargo that is heating, minimizing the increase in temperature that might cause further deterioration."

The UK P&I Club is a major provider of P&I insurance and other services to the international shipping community. Established in 1865 the UK P&I Club insures over 239 million tonnes of owned and chartered shipping through its international offices and claims network. 'A (Stable)' rated by Standard & Poor's with free reserves and hybrid capital of $558m, the UK P&I Club is renowned for its specialist skills and expertise which ensure 'best in class' underwriting, claims handling and loss prevention services.

The UK P&I Club is managed by Thomas Miller, an independent and international insurance, professional and investment services provider.

DNV GL opens fleet performance centres

DNV GL has opened two digital fleet performance centres in Hamburg and Singapore to support its ECO Insight customers in monitoring and optimizing their fleets. Expert systems at the fleet performance centres are able to check incoming vessel data from customers using the ECO Insight platform, providing quality control of the data and offering suggestions on potential improvement levers for both individual vessels and fleets, such as identifying speed loitering and over-usage of auxiliary engines or boilers.

The performance centre provides comprehensive and customizable fleet monitoring. In development and in operational trials for the last nine months, it is already supporting pilot clients in Asia and Europe daily with data quality and performance alerts, performance reviews, and ad-hoc investigations into performance issues and claims cases, among others. In addition to machine-learning systems, dedicated DNV GL performance managers verify the validity of performance alerts before they are sent to customers. They also look at why performance is different between vessels of the same fleet and propose actions.

"We are very glad to have partnered with DNV GL. It is of great value to us when performance experts provide a 'second pair of eyes' on our fleet and give us real-time warnings if vessels are not being operated in the most efficient manner," said Christian Rychly, managing director of the German shipping company Leonhardt & Blumberg, during the opening and ribbon cutting ceremony of the new fleet centre in Hamburg. "To mitigate the market pressure, we exactly need those tools which enhance our efficiency and help us to comply with the ever more challenging environmental regulations," he added. As one of the pilot customers the concept has been developed with, Leonhardt & Blumberg has installed the ECO Insight tool already on 35 of its vessels, with more than 20 planned to follow soon.

"The fleet performance centres are just one of the ways we are working to use digitalization to help our customers enhance their competitiveness through improved efficiency, greater safety, and increased margins," said Knut Ørbeck-Nilssen, CEO of DNV GL – Maritime. "Without the valuable contribution of pilot customers such as Leonhardt & Blumberg, we wouldn't have been able to develop this innovative solution. By working together, we can now truly see the benefits of 'big data' in shipping – and giving ship managers a direct line to our trusted expert advice, makes taking these gains even easier."

The launch of the fleet performance centres is the first building block of the new ECO Insight 2.0, to be released in August 2017. Only two and a half years after its launch, ECO Insight is already the market leader, with 1,400 vessels from 80 customers around the globe. ECO Insight provides a comprehensive and easily accessible way to manage the performance of a fleet by combining vessel reported data with industry information, including voyage, hull and propeller, engine and systems, and fuel quality performance.

Getting the buzz on bulkers

what's affecting the shipping industry?

MEPC 71: 2020 deadline reaffirmed as IMO agrees to consistent implementation

Any suggestion that there may be any form of delay to the 1 January 2020 implementation of the 0.50% sulphur limit in 2020 was ruled out at the 71st session of the Marine Environment Protection Committee in early July, as a majority of member states rejected a proposal to collect data to allow the International Maritime Organization to take stock of the availability situation ahead of 2020.

Among the papers submitted to MEPC 71, two pointed out that there would be regional differences in the ability of refineries to meet demand for low-sulphur fuels from the marine sector in 2020. Both papers suggested the IMO should take such data into account and consider transitional measures if data demonstrated significant difficulty in meeting demand.

One of the documents, submitted by Brazil and India, said data is needed from refineries and bunker suppliers as to how much 0.5% sulphur fuel they can offer for marine use in 2020 and also that data is needed from shipowners as to how many ships would be fitted with scrubbers by 2020. It proposed that the estimated requirement and availability needs to be made available to MEPC 73, which is due to be held in the later part of 2018, and that if the data show that "a very wide gulf for meaningful enforcement, MEPC may consider permitting an appropriate transitional period prior to enforcement."

IBIA was first among those commenting on these two papers in plenary, saying: "At MEPC 70, the committee took a leap of faith and decided to introduce the 0.5% sulphur limit in 2020 based on a forecast that there would be sufficient refining capacity to meet global demand. It was a good decision, as it gave us certainty about the date so that we all know what we have to prepare for. We must be careful now to ensure we are not moving the target as that would send the wrong signal and throw preparations into disarray. The target date is the only thing that we actually know and we must not sow any doubt about it if we are going to succeed with the implementation."

IBIA also pointed out, however, that the picture with regards to actual supply capacity, marine fuel demand and uptake of scrubbers will only become clearer much closer to the implementation date, and therefor supported the general idea of data collection.

"Obtaining such data on the cusp of the implementation date, along with non-availability reports provided to the IMO from the start of 2020, would help assess where availability of compliant fuels is problematic and also get a clearer picture of when and how the situation is improving," IBIA told MEPC 71, adding: "If such data are made available for dissemination to member states it may assist their authorities when assessing fuel oil non availability reports."

A large number of countries spoke in support of data collection, but the number of countries objecting to it was greater. Among their arguments against it was that the question of availability had already been addressed by the study undertaken for IMO by CE Delft which was provided to, and approved by, MEPC 70. Most importantly, however, they objected to the idea because they thought it may lead to uncertainty and potentially delay the preparation process. Any talk of a transitional period permitting exemptions was firmly rejected.

Although nobody said so, it is possible they were afraid that approving data collection may end up casting doubt on the conclusion in CE Delft study, which now seems to be interpreted by some as irrefutable evidence that there will be sufficient availability in 2020.

As one delegation noted: MEPC 71 had already postponed the implementation of one major regulation decision (a reference to a two-year extension of the deadline to install ballast water treatment systems), and it would be a very poor signal if it was also opening the door to delaying another milestone regulation.

When IBIA and others supported data collection, our intention was clear: we do not want to call the implementation date into question. However, data would be helpful to monitor the situation and allow all parties understand it better and work on addressing any problems.

With a majority opposing data collection, MEPC 71 did not agree to specifically add this to the list of items in the scope of the so-called 'new output' on consistent implementation of the 2020 sulphur limit which was drafted by the Sub-Committee on Pollution Prevention and Response (PPR 4) in January this year. They said the scope developed at PPR 4 adequately addresses the issues. The scope will, however, include a specific request from the Maritime Safety Committee (MSC) to explicitly add to the list a consideration of the safety implications relating to blending fuels in order to meet the 0.50% sulphur limit.

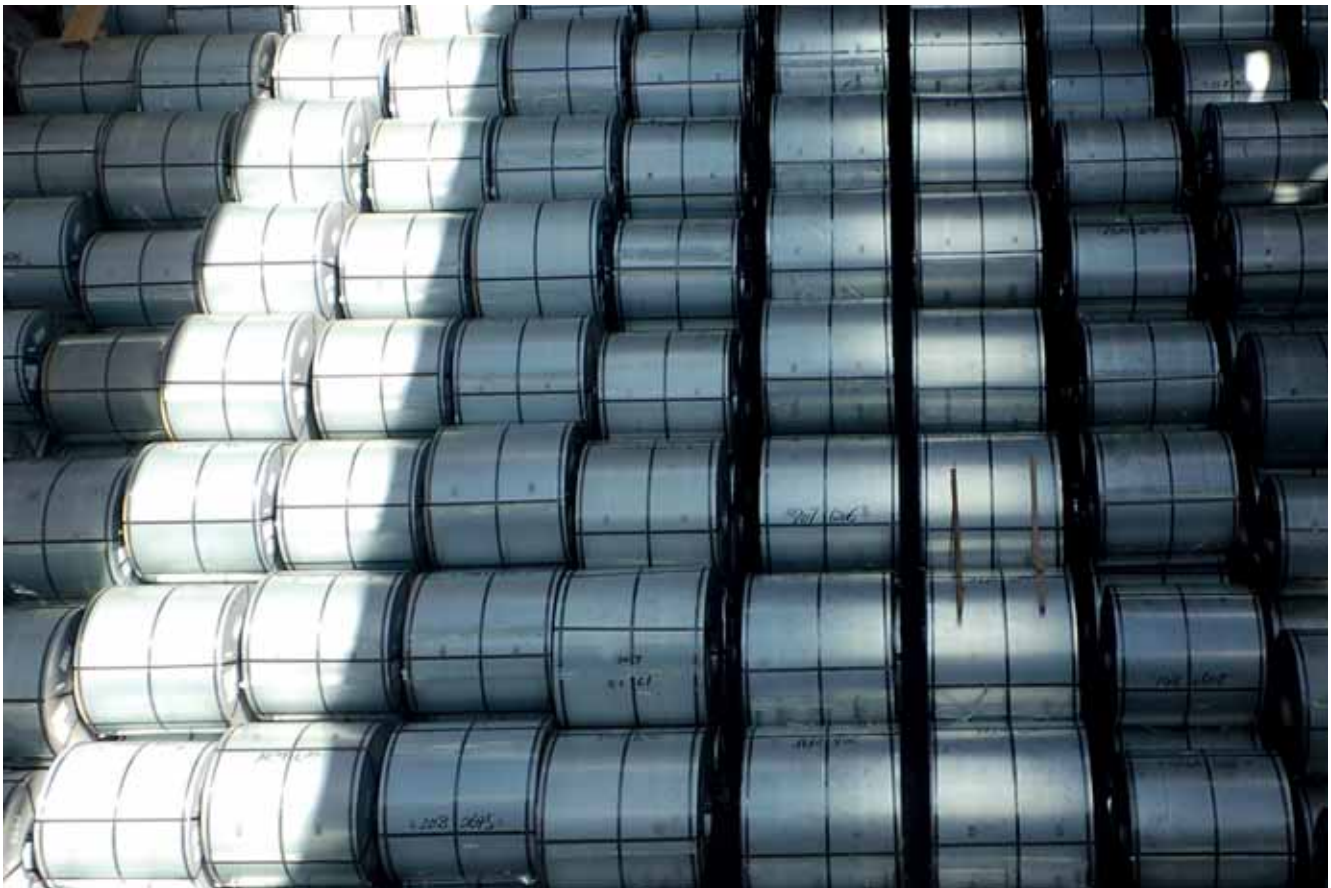
There was, as expected, broad support at MEPC 71 to approve the new output on "Consistent implementation of regulation 14.1.3 of MARPOL Annex VI" developed at PPR 4, for inclusion in the Sub-Committee's agenda with a target completion year of 2019. Recognizing that time is short, PPR, which meets just once a year in January or February, will also hold an intersessional meeting in the second half of 2018 to progress work on consistent implementation of the 2020 sulphur regime. *Source: IBIA*

ABS initiative improves bulker loading safety

NEW TOOL DELIVERS A COMPREHENSIVE APPROACH TO ATYPICAL LOADS FOR BULK CARRIERS.

ABS, a leading provider of classification and technical services to the marine and offshore industries, has introduced a new service and analysis tool that will allow atypical cargoes on bulk carriers. The software streamlines loading analysis and provides a safer approach to loading atypical bulk cargo.

"ABS understands that maintaining a leadership role means finding ways to improve safety and efficiency for industry," says ABS Executive Vice President for Global Marine Dr. Kirsi Tikka. "Our new steel coil loading solution delivers customization options to expand the range of loads that can be carried safely



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by bulk carriers."

In developing this new software and service, ABS has taken a comprehensive approach to steel coil loading. This new capability helps improve efficiency, enabling faster decisions regarding the safety of non-traditional loads. Using the ABS loading analysis software enables timely and accurate decisions about the achievable safety for steel coil loads that are not included in the loading manual.

"Bulker owners and operators are looking for every opportunity to keep their fleets operating in challenging market conditions," adds Tikka. "We recognize how important it is for the bulker industry to expand their service, and we also understand the critical role that safety plays."

ABS understands the unique operational and regulatory challenges that the bulker sector faces and has pioneered solutions to address both environmental requirements and vessel performance. As a major player in marine classification, ABS classes all bulk carrier designs and sizes, from Handy and Handymax to Capesize and very large ore carriers (VLOCs), and is positioned globally to provide exceptional class services, including timely reviews of nontraditional cargo loads.

About ABS

Founded in 1862, ABS is a major international classification organization devoted to promoting the security of life and property and preserving the natural environment through the development and verification of standards for the design, construction and operational maintenance of marine and offshore assets.

Eco bulker operator shuns early target date for emissions

Hamburg Bulk Carriers (HBC) has warned of the dangers of bringing forward the deadline for stricter controls on greenhouse gas emissions from shipping, despite its pending delivery of the last in a series of Handysizes that already fulfill the green requirements.

Any move to bring forward the deadline for greenhouse emissions to 2020 instead of 2025 would be "dangerous," says Stefan Bulow, managing director of HBC, with safety concerns outweighing any potential commercial advantages.

The comments come ahead of this month's delivery of the 43,500dwt *Zephyr Venture*, the last of ten geared Handysize bulkers delivered to HBC and its partners from China's Qingshan Shipyard. The vessels already meet the energy efficiency regulations to be imposed by the International Maritime Organization (IMO) in eight years time, with a carbon-dioxide emission level 40% below the average for the Handysize fleet.

The Deltamarin design was lauded at Nor-Shipping, where the 43,500dwt *Venture Joy* (built 2016) beat 16 other designs, including a hybrid ropax, LNG carriers and cruiseships.

But Bulow cautions against bringing forward target dates for implementation of the Energy Efficiency Design Index Tier III. It might only be achieved by reducing engine power on ships to levels that cause problems with manoeuvrability in adverse conditions. Globally, the fleet is unlikely to meet the requirement in the next two years, he says.

The target dates are being debated at the IMO, which has established a project to set minimum installed power standards for ships.

Bulow, who has been working on minimum propulsion requirements with classification society DNV GL, draws comparisons with emissions testing in the car industry, where manufacturers bent the rules to meet their targets.

Historic lows in the freight market and low bunker prices have taken some of the shine off Deltamarin's successful high efficiency bulker design, known as the B Delta series.

But Bulow says the advantages of eco-ships are retained even with the drop in the fuel price and that these are noted in HBC's operated fleet of 50 bulkers.

The HBC43 vessels are LNG dual-fuel ready designs and have performance monitoring equipment to comply with the European Union's monitoring, reporting and verification regulation requiring them to provide data on emissions.

While there is talk of the company succeeding in finding fresh funding from investors, HBC has little interest in older designs that could be sold by German banks.

"These are outdated assets that were simply ordered on the basis of money looking for a home. I would never consider buying these ships because I don't see them as the future of HBC or shipping," he said.

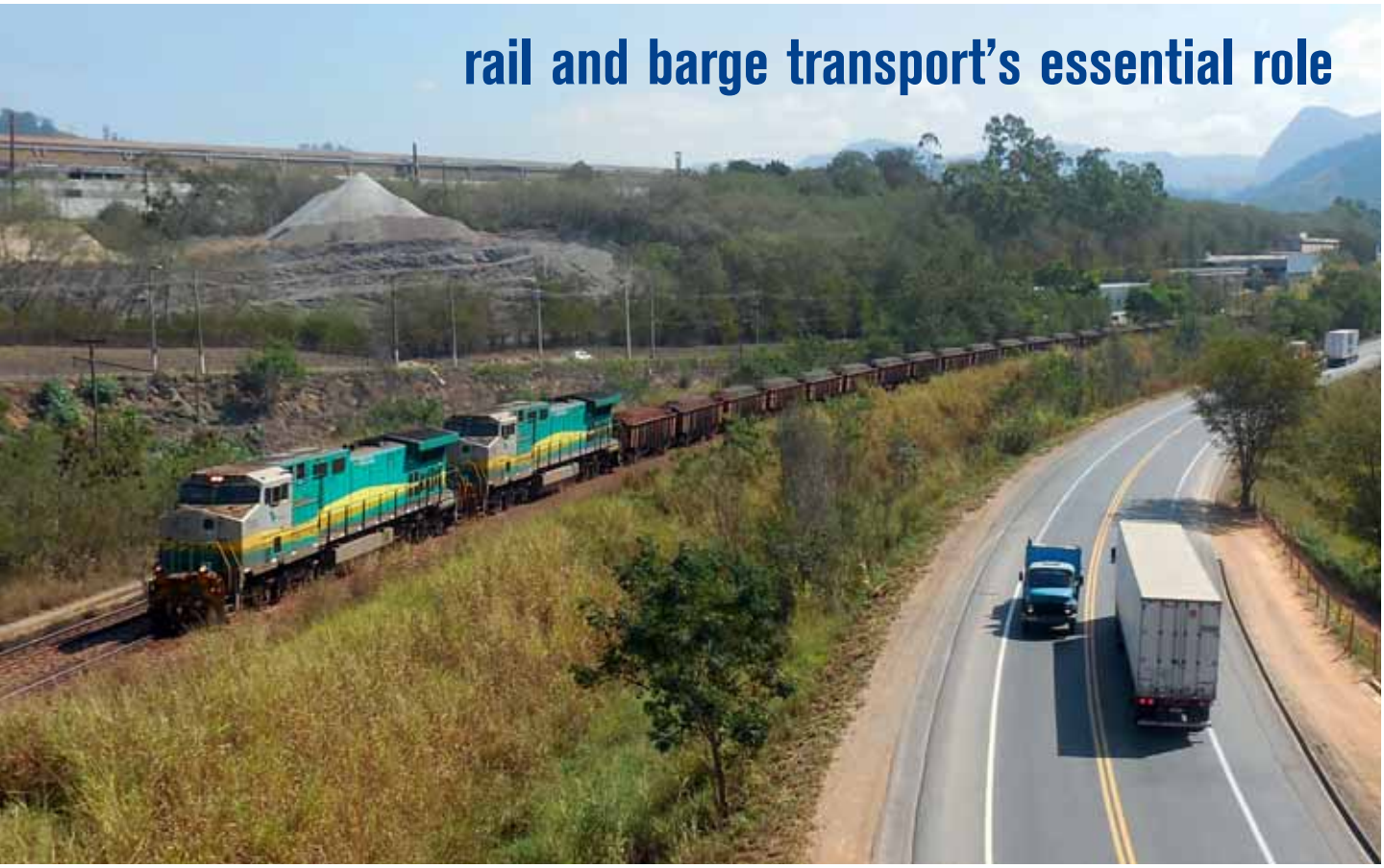
Similarly, the company has little interest in newbuilding orders.

"Prices are tempting but if the industry is led by price only, we'll never come out of the [market] situation," said Bulow. DCi

The Venture Goal, *sister vessel to the* Zephyr Venture.

Solid infrastructure vital for market success

rail and barge transport's essential role



Brazilian record crops hampered by inadequate transport networks

An all time record grains crop of 230mt (million tonnes) is being harvested in Brazil this year, 40mt more than last year's crop, *writes Patrick Knight.*

It might be thought that farmers and traders would be celebrating this feat. But because world prices of soya and maize have fallen sharply in recent months, while transport and other costs have risen, farmers will get much less this year than last for their grain, even though so much more will be available, and some will make losses.

The network of railways, waterways and roads needed to get the grains from fields to ports is coming under tremendous pressure. Farmers and traders are having great difficulty in physically exporting all of this year's massive crop. Stocks are building up on farms, and some soya and maize will have to be left in the open. There will be insufficient storage to cope with the next crop to come along, and with less to spend, farmers may cut back on plantings 2017/18.

At the moment, most of the soya and maize is taken to ports by trucks, along increasingly congested roads. Although the building of several new railways has begun in the past few years, and some stretches are complete, none of these line is yet fully operational. Successive governments as well as operating companies have been unable to agree a formula which would allow trains to travel freely along all parts of the system.

The only real advance in logistics in Brazil, has been the building by private companies of numerous new riverside terminals in the north of the country, together with fleets of barges, which allows grains to reach deep sea ports faster and more cheaply. But the roads running to these ports have not been improved, so costly new facilities often stand idle.

The situation regarding grains is in stark contrast to that regarding Brazil's other leading dry bulk cargo, iron ore. Proper planning, notably by the Vale company, has allowed existing lines to be upgraded, even duplicated, which has allowed the cost at ports of Brazilian ore such as Itaqui, and Tubarao, to be cut to the lowest in the world, while at the same time, production has been switched from older mines in Minas Gerais state, to the Carajas complex in Para state.

The Brazilian economy has performed very badly in the last four years. With domestic demand down, more has been exported, but less has been imported in recent years as well. This has resulted in a large surplus in the visible trade account

to build up. This inflow of funds has cause the currency to strengthen, but not sufficiently to choke off buoyant exports, either in volume, or earnings.

A trade surplus of up to $40 billion is expected this year, something which contrasts sharply with the large trade deficits experienced by Brazil during the first years of the new century. The fast growth of the economy, and the strength of the currency, had hindered exports, and sucked in imports at that time.

The healthy situation regarding trade is all the more surprising because spending on Brazil's infrastructure, roads, railways, waterways, ports and airports, has not kept pace with the rise in goods being moved. The huge crop of soya and maize, most of it available for export, has made this glaringly obvious.

Farmers growing grains in Brazil have done very well in the past few years. Prices have been high, while demand, particularly from China, the leading market for Brazil's soya beans, has been growing steadily. Largely because of the extra grains being grown in Brazil, the feared world food shortage has not come about.

For years, Brazil's farm community and trading companies have tried to draw attention to the deteriorating logistics system. The situation came to a head in February, when unusually heavy rains caused the major BR 163 road, which runs through the main soya growing region of Mato Gross state, to be blocked for a week. About 800 trucks pass along this highway, some of which is not paved, each day during the peak harvest season. But because of the heavy rains, the road became almost impassible for more than two weeks, and fewer than 100 trucks could get through each 24 hours, each one having to be pushed out of the deep mud by tractors. An increasing proportion of the soya and maize using this route is on its way to the terminals at Miritituba, on the river Tocantins, where it is loaded onto the trains of barges which in the past few years have been built by all the trading companies which arrange for the sale of most of Brazil's grains: ADM, Bunge, Cargill, Dreyfus, and the Brazilian owned Maggi group. Up to 20mt of soya now leaves by this northerly route. Because so many trucks loaded with soya beans and meal had to turn round and head south, to Santos, Paranagua and Rio Grande, rather than north, numerous ships waiting to load in the north of Brazil, had to be re-located south as well. This caused substantial demurrage charges to accumulate.

The five large trading companies despair that the BR 163 road, on which construction work linking Cuiaba, capital of the state of Mato Grosso, to the port of Santarem on the Amazon river, was begun by the army in 1972, will never be complete. Although much of the road has now been paved, the quality of the surface is poor, and plans for its badly-needed duplication are on hold, as construction companies, waiting to be paid, drag their feet.

To solve the situation, the trading companies proposed building a 1,200km 'Ferrograo' railway to run from the main soya producing region in the south of Mato Grosso state, to the riverside port of Miritituba. A second phase of this to run on to ports close to the mouth of the Amazon river. At the moment, it can take two weeks for a truck loaded with 60 tonnes of soya to reach Miritituba. Going by train could cut the cost per tonne from $160 to $80.

As with this, and numerous other badly needed and sometimes already partly completed rail projects in Brazil, the problem has been finance, and the agreement of a payment system acceptable to all players. But now China's giant 'Communications Construction Company', the state-owned CCCC, has shown an interest. This is not surprising, given the importance that Brazilian soya, and increasingly maize as well, has for China. Work on the line, in which rail companies from Russia and Spain have also shown an interest, could start at the end of this year, with the 1,700km line to be complete by 2022

The CCCC company may also get involved with completing the 1,728km-long 'Trans nordestina' line, which runs west to east from soya producing regions to ports in the east of Brazil. This line, work on which started in 2005, and which was promised to be completed in 2010, is now expected to be complete in 2020. Foreign investors are also being sought to complete this line, as well as to operate the 2,500km-long North–South line, also started in the 1970s to run from a point on Vale's Carajas line, to link with lines in the south east of the country. This line is also only operating for less than half its length. So far, finding a formula which will allow companies can run their own trains on the networks of all companies, has not been achieved. About one thousand million tonnes of goods passed through all Brazil's ports in 2016, 1% less than in 2015. The fall in trade is explained both by the fall in imports, and the fact less grains were available last year as in 2015. The cargo responsible for almost half the volume exported, was of course iron ore, another commodity whose price has fluctuated widely in the past couple of years, but for which demand continues to grow steadily. This is mainly because of the insatiable demand from China, for more than a decade now, the largest single market for Brazilian ore. With the exception of some ore which travels from mines to ports along slurry pipelines, the great majority goes by train. The share leaving from Vale's giant Carajas mine, has grown at the expense of that from more elderly mines in the state of Minas Gerais, and with the start up of the new 'north' mine at Carajas, somewhere between 360–380mt of Vale ore will be exported this year, compared with 350mt in 2016, 150mt of that coming from Carajas.

Ore from Carajas is taken along the now fully duplicated 800km line to the deep water port of Itaqui, where it can be loaded for a cost of little more than $8 per tonne. This compares with the $13 per tonne the generally lower quality of ore produced in mines in Minas Gerais state costs. The lower cost of Brazilian ore compensates for the fact that it costs significantly more to transport ore from Brazil to China, than that from Australia. But the low cost and high quality of both these ores explain why Brazil has little to fear from competition from most mines in China, or anywhere else, including India.

GB Railfreight remains at the forefront of changing business environment

GB Railfreight (GBRf) is one of freight's great success stories. Launched in 1999, the business has built to a team of over 650 and has turnover in excess of £120m, making it one of the railway's fastest growing companies in the UK. The company's focus is on innovating and outstanding customer service. It provides a wide range of rail transport solutions and rail services to its customers, operating over 1,000 trainloads a week, moving approximately 15% of UK's rail freight, on its fleet of more than 130 locomotives and 1,100 wagons.

Clients include DP World London Gateway Port, for which it manages the movements and preparation of all trains in and out of the facility. It also works with the Mediterranean Shipping Company (MSC), running shipping containers out of the Port of Felixstowe. GBRf recently re-purposed 49 coal hoppers to move aggregates from Tarmac quarries in Arcow and Swinden to Bredbury, Agecroft, and Leeds. Since 2015, it has been working very closely with Drax Power Station in Selby, North Yorkshire to transport the biomass pellets the facility uses to generate electricity from the Port of Liverpool.

Moving goods and cargo by rail has a number of benefits that support the economy, the UK's population, and the environment. An average freight train can remove 60 HGV journeys from the roads and the largest up to 160. This eases congestion on roads and enables people to get to and from their destinations more effectively and efficiently, increasing productivity and benefiting the economy.

GBRf is also committed to helping the UK meet its obligations in terms of cutting its carbon emissions. The fleet of 16 class 92 electric locomotives, for instance, represents the company's commitment to helping reduce the amount of freight that travels on heavy goods vehicles on UK roads.

Moving goods on the freight network helps to cut the UK's carbon emissions because haulage by rail is more efficient than by road. On average, a gallon of fuel will move a tonne of goods 246 miles on the rail network, while the same amount will only get you 88 miles by road. If there is less congestion on the roads too, carbon emissions are also lowered as there will be fewer engines idling in traffic jams and journey times will be reduced.

But it is not just about fuel consumption. Rail freight's CO_2 emissions are 76% lower than road per tonne carried. When this is combined with rail's advantageous performance in terms of nitrous oxide and particulate matter emissions, rail freight can demonstrate a clear contribution to the challenge of meeting carbon-cutting targets.

The emphasis on reducing the country's carbon footprint is also seeing significant efforts by those involved in building new infrastructure to utilize more green techniques in construction. For clients such as Crossrail and FCC Environment, GBRf has been engaged in hauling away spoil from the construction works to be reused or recovered rather than disposed of.

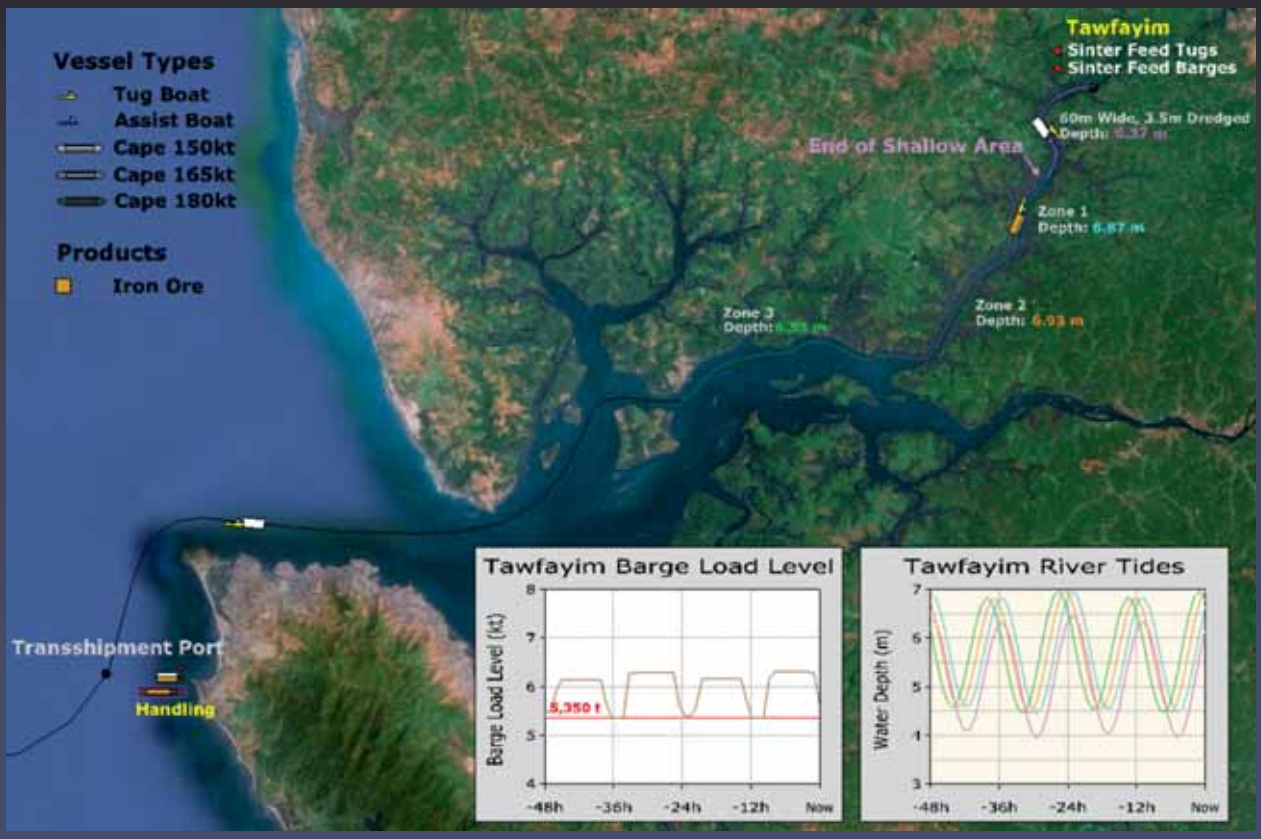
The freight industry is facing a challenging time, with the rapid decline of coal and steel. The sector must grow beyond the core commodities which have, until now, provided stability and longevity. And with the restructuring of Network Rail, one of the rail freight sector's biggest customers, the role of the Freight Operating Companies in rail upgrade and maintenance work becomes more important. This means the industry may be reluctant to diversify into new markets where the future is not so clear.

GBRf is passionate about developing new economic models and markets. This decline in freight's traditional business provides an opportunity to rethink the role of rail freight in the UK and to expand into other markets. GBRf is driving innovation in the sector, for example taking advantage of the opportunity to support online retailers to meet the rapid increase in consumer demand.

The sector needs to consolidate existing markets to continue to drive innovation. The intermodal and aggregates markets are two commodity areas that could provide long-term foundations for rail freight whilst delivering benefits for the UK through supporting construction and removing lorries from roads. One way in which this could be achieved would be in the creation of strategic network capacity that serves the UK's core markets. To be able to do all this, however, rail freight will need the support of government.

Change in the industry is a fantastic opportunity to develop rail services, support the economy to grow, and reduce air pollution by taking lorries off our roads. GBRf will continue to be at the forefront of this changing business environment and be a voice for the sector.

Finding the solution to a transportation challenge in West Africa



The development of the Marampa Iron Ore Project in Sierra Leone was a unique project where a new iron ore processing plant was developed in a remote area of the country with no easy access to existing infrastructure to move the product to market, *writes Joel Shirriff, Global Practice Lead Terminals & Transportation, Ausenco*. Having already developed a cost-effective solution for the mineral processing, Ausenco was approached by its client to help with the challenge of developing a transportation logistics system. As the site was relatively close to a major river, Ausenco's team of transportation specialists identified that a barge solution was likely the best option to deliver the expected 3.6mtpa (million tonnes per annum) of iron ore.

Technical challenges that needed to be addressed by the barge solution included the seasonal fluctuation in river water depth, shoreline access, and the 79km transit distance to deep water for transshipment operations to load Capesize ships. Ausenco took a holistic overview of the transportation system — starting from the mine site, and moving through the following steps: trucking, storage, barge loading, river transit and transshipment, to identify the optimal site location for the up-river operation.

This system analysis involved the development of a full dynamic simulation model using Ausenco's proprietary software tool, Transportation Logistics Simulator (TLS), which allowed it to validate where the perceived choke points were in the system. This same model was used to run extensive sensitivity cases where options of barge size versus river draught, and the potential for dredging, were tested to optimize the overall system against availability and cost. The end result is a system with three tugs moving five barges (up to 8,000 tonnes each), delivering a minimum of 20,000 tonnes per day to the transshipment operation for loading vessels with iron ore concentrate by crane and grab with an average parcel size of 160,000 tonnes.

An important feature of the design was the inclusion of a floating berth for loading the barges. The floating berth structure presented an optimal solution for the upriver barge terminal and loading operations, as it not only managed the significant tidal and river current variations, but did so with minimal impact to the environment that would result from a fixed berth system. Barges are brought alongside the floating dock by tugs and loaded using a telescoping mobile shiploader unit supported by the dock and fed from an iron ore stockpile on shore. The minimal amount of permanent infrastructure installed for this system not only reduced the initial capital investment necessary to move into production, it also allows the assets to remain flexible for transfer and re-use at another location if necessary.

The timing of the transit of barges up and down the river requires careful coordination as the loaded barges must only be moved through certain areas of the river route at, or near, high tide to maximize their carrying capacity. Other sections of the river route are too narrow to allow passing of tugs and barges in opposite directions, where loaded barges have priority to move downstream to the transshipment operation.

This project is a prime example of how barges can be used to economically move large tonnages of bulk cargo to market. The minimal infrastructure solution and resulting low capital investment were well suited to the needs of this mining client developing a project in a very challenging geographic location. In addition to being a fully transferrable asset, the barges represent a scalable option for possible future expansion.

Captrain Deutschland: major German rail logistics provider

Captrain Deutschland is a major rail logistics company in Germany and Europe. Be it international traction services, industrial rail operations or transport concepts tailored to the individual processes of its customers, Captrain Deutschland offers innovative, customized and efficient logistics solutions. With operations in Germany, Denmark, The Netherlands and Poland, licences in Austria, Switzerland and The Czech Republic, as well as affiliates in Belgium, France, Italy and Spain, Captrain Deutschland ensures an international presence and constant proximity to customers.

In 2016 Captrain Deutschland transported 54.7 million tonnes of freight with a transport performance of 11.3 billion tonne-kilometres, and generated a turnover of €332 million with 1,400 employees.

Captrain Deutschland: at home in all industries
Traffic performance 2016

KEY FIGURES	
Turnover	€332 million
Personnel	1,400
Transport volume	54.7 million tones
Traffic performance	11.3 billion tonne-kilometres
Locomotives	175
Wagons	2,500
Railway workshops	7
Infrastructure	403km

Captrain Deutschland offers a range of services. These include:

- **industrial railway operations:** planning, operating and maintaining infrastructure, providing and maintaining vehicles, operating the railway and handling, as well as all its additional services. Captrain Deutschland offers a complete service for rail production logistics. A notable reference for this is the Industrial railway operation for ArcelorMittal Bremen GmbH. Together with ArcelorMittal Bremen, Captrain Deutschland established Hansebahn Bremen in 2010. Since then, Hansebahn has organized and implemented rail transport for the steelworks in Bremen and maintained the existing infrastructure and vehicles. This allows Captrain Deutschland to continually improve the railway tracks and vehicle resources while minimizing maintenance costs as part of a long-term co-operation agreement. A work-based billing system forms the basis for ongoing operational improvements. The legal form of the company — a joint venture — gives ArcelorMittal maximum transparency for its important railway operations, with regard to security of supply.

Development of new flat wagons for transporting steel

Captrain has been using newly developed flat wagons for the optimum transport of steel hollows and round billets since the end of 2015. The aim was to transport both products using a uniform wagon type, rather than different types, as before. However, as both cargoes pose very different transport capacity challenges, such a wagon was not yet available on the market. The round billets (continuous castings) require a high payload, while the transport capacity for hollows must have a large volume. Due to the high intermittent weight of the continuous castings on a long wagon surface, as required for the hollows, the stability of the wagon floor, in particular, also had to be ensured.

In co-operation with the company 'on Rail', Captrain developed a special flat wagon of sufficient length and with optimum stanchion height, in conjunction with the loaders. This wagon also has a special floor that ensures equal weight distribution. A large part of steel shipments are now uniformly transported using this new wagon type, which has led to a considerably faster, more flexible transport process. Fewer wagons are required, and there is no need for complex shunting activities to sort the wagons according to type.

- **traction services:** regionally or across borders, Captrain Deutschland traction services take customers' goods from one loading station to another. Reliability, safety and quality are its operating principles. Comprehensive information and delivery services as well as damaged wagon management complete the offer. This means clients enjoy and optimal use of resources while keeping costs down. A notable reference for this is: Traction services for Hupac AG. Captrain Deutschland has been providing demanding traction services for Hupac between Rotterdam and Ludwigshafen since 2003. Modern interoperable locomotives and multilingual drivers ensure seamless transport across national borders. The company's services include delivery to and collection from terminals, as well as professional damaged wagon management. Maximum reliability and quality at fair market conditions, coupled with the permanent exchange of personal and automated information and data form the basis for this long-term cooperation with one of Europe's major intermodal operators.

- **integrated logistics:** local infrastructure management, wagon supply, shunting operations, train and support services: as a full-service provider, Captrain Deutschland develops logistics solutions tailored to its customers' individual needs from a single source. It therefore combines industrial logistics with regional and long-distance services, to create cross-border rail transport systems – locally, regionally and across Europe. A notable reference for this is: Integrated Logistics for Salzgitter Mannesmann Precision GmbH. Captrain Deutschland has a long-standing customer relationship with Salzgitter Mannesmann Precision. Since 2004, it has been transporting round billets and, since 2010, hollows for the company. In 2014, Captrain Deutschland transported 220,000 tonnes of round billets between Duisburg and Zeithain and 150,000 tonnes of hollows from Zeithain and Muelheim an der Ruhr to Riesa, Brackwede, Holzhausen and Vitry le François (France). Captrain Deutschland has also been operating the industrial railway in Zeithain since 2005. Important building blocks for customer satisfaction include a tailor-made wagon solution and an operating concept that combines high reliability with maximum flexibility. By optimizing capacity utilization, it can guarantee safe supply to – and offtake from – each location. DCi

Damen celebrates delivery of tugs

Ocean takes delivery of first Damen tug

Delivery signing takes place in presence of Dutch king and queen

Italian maritime service provider Ocean S.r.l. has welcomed its first Damen tug — a Stan Tug 2608 — into its fleet. The company, part of the Ocean-Team Group, will deploy the vessel in harbour towage operations in the ports of Monfalcone and Porto Nogaro in the northern reaches of the Adriatic Sea. The signing of the delivery protocol was attended by King Willem-Alexander and Queen Máxima of the Netherlands, at the Palazzo Reale in Milan, as part of a recent State Visit to Italy with a parallel Netherlands Economic Mission. The Ocean Group operates more than 40 vessels and barges to provide tug, towage and offshore services in the Adriatic, Mediterranean and Caspian Seas. Harbour towage in Italy, Slovenia and Montenegro forms the core of the group's operations portfolio.

Flexible harbour assistance

The new tug, called *Bat*, will strengthen Ocean's capacity in the compact confines of the port of Monfalcone. To this end, the 26-metre long vessel's 45-tonne bollard pull has been supplemented with an aft winch to allow operations over the stern as well as over the bow. Further modifications include installation of FiFi equipment (600m^3 capacity), towing pins and adjustments required for Italian Flag compliance.

Damen delivered the *Bat* on its own keel from Damen Song Cam Shipyard in Vietnam. "This is another service that we can offer our customers," says Damen Regional Sales Manager Andrea Trevisan. "I would like to praise the excellent work carried out by the delivery crew in sailing the tug from our specialist tug production yard. This was not an easy task as it was the beginning of the monsoon season, which saw this 26-metre long tug experiencing 5-metre high waves. Vessel and crew arrived safely at the delivery destination in Trieste, Italy."

First impressions

An important aspect of the vessel order was Ocean's specification for a fast delivery time. "We required a delivery time of six months — and we are pleased to say that Damen has fully met our requirements," comments Ocean Managing Director Michela Cattaruzza Bellinello.

Damen Sales Manager Andrea Trevisan and Ocean Managing Director Mrs Michela Cattaruzza Bellinello sign the delivery protocol of Damen Stan Tug 2608 at a ceremony attended by King Willem-Alexander and Queen Máxima of the Netherlands.

Special delivery

Trevisan describes the signing of the delivery protocol as a very memorable occasion. "It has taken 50 years for Damen to deliver the first tug to the Ocean Team Group based in Trieste," he says. "This could not have been celebrated better as we were privileged to complete this delivery in the presence of His Majesty King Willem-Alexander and Her Majesty Queen Máxima. This was a true honour and very emotional!"

"We are proud to see a Damen tug sailing under the Ocean flag. We are certainly looking forward to building a long and productive business relationship together."

Damen Shipyards Group

Damen Shipyards Group operates 33 shipbuilding and repair yards, employing 9,000 people worldwide. Damen has delivered more than 6,000 vessels in more than 100 countries and delivers some 180 vessels annually to customers worldwide. Based on its unique, standardized ship-design concept Damen is able to guarantee consistent quality.

Damen's focus on standardization, modular construction and keeping vessels in stock leads to short delivery times, low 'total cost of ownership',

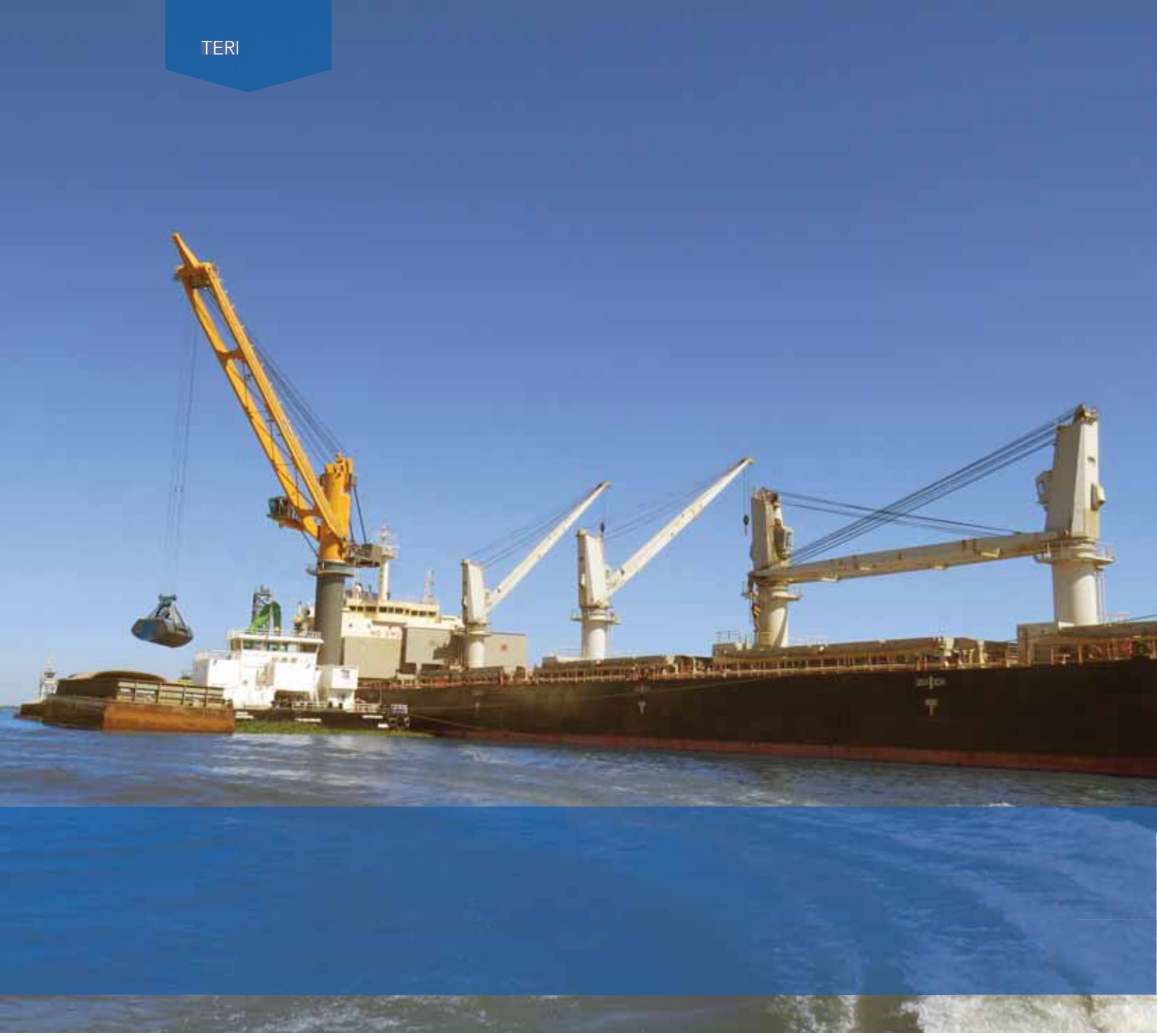
Captain Luigi Cattaruzza President and founder Ocean-Team Group.

high resale values and reliable performance. Furthermore, Damen vessels are based on thorough R&D and proven technology.

Damen offers a wide range of products, including tugs, workboats, naval and patrol vessels, high speed craft, cargo vessels, dredgers, vessels for the offshore industry, ferries, pontoons and superyachts.

For nearly all vessel types Damen offers a broad range of services, including maintenance, spare parts delivery, training and the transfer of (shipbuilding) know-how. Damen also offers a variety of marine components, such as nozzles, rudders, anchors, anchor chains and steel works.

In addition to ship design and shipbuilding, Damen Shiprepair & Conversion (DSC) has a worldwide network of 17 repair and conversion yards with dry docks ranging up to 420 x 80 metres. Conversion projects range from adapting vessels to today's requirements and regulations to the complete conversion of large offshore structures. DSC completes around 1,350 repair and maintenance jobs annually.



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Two new Damen tugs for Rimorchiatori Riuniti

Italian tug operator Rimorchiatori Riuniti has continued to expand its fleet with the deliveries of two new Damen tugs; an ASD 2913 called *Danimarca* and an ASD 2411 called *Columbia*.

The Danimarca.

The delivery of the *Danimarca* took place in Genoa on 14 June 2017. This new tug will join the ASD 2913 Germania that joined the company's fleet at the beginning of the year. Like her sister vessel, the *Danimarca* has also been installed with FiFi 1 and an aft winch, in addition to oil recovery and escort capabilities.

This extra equipment, combined with a bollard pull of 80 tonnes, means that Rimorchiatori Riuniti will be able to sign these two ASD 2913 tugs up for offshore tasks as well as harbour assistance duties.

Compact performance

Handed over to Rimorchiatori Riuniti at the end of May, the *Columbia* has joined for harbour towage duties with sister vessel *Malta* in the port of Genoa. At 24 metres long and 11 metres wide, these tugs are compact enough to allow deployment in small port situations. Yet, in terms of performance, no compromises need to be made since the ASD 2411 still yields a 70-tonne bollard pull capacity.

"We are very proud that Italy's largest tug owner has called on Damen to contribute to their continued fleet expansion," says Damen Regional Sales Manager Andrea Trevisan. "And, with both these contracts only finalized a few months previously, we are pleased to say that we have once again completed these contracts swiftly."

Consistent quality

"Our philosophy of standardized construction means that our clients are afforded consistent quality, irrespective of which of our yards we build their vessel."

The Columbia.

Four recent Rimorchiatori Riuniti vessels demonstrate this point. While the *Germania* and *Danimarca* were both built at Damen Shipyards Galati in Romania, the *Columbia* was built at Albwardy Damen (the UAE-based joint venture of Albwardy Marine Engineering and Damen Shipyards Sharjah) and the *Malta* at Song Thu Shipyard in Danang, Vietnam. DCi

Agreement reached for LNG supply station at Dunkerque

Dunkerque's LNG terminal and Grand Port Maritime de Dunkerque have signed an agreement for the development of an LNG supply station.

The use of liquefied natural gas (LNG) by shipping and road vehicles has grown significantly in recent months with new projects (orders for ships, LNG supply stations, etc). Dunkerque-Port and Dunkerque LNG are convinced of the role that LNG will play both at sea and on land in reducing greenhouse gas and particle emissions.

The project: a station to supply tank trucks with LNG at the terminal

Dunkerque-Port and Dunkerque LNG have signed a partnership agreement for the development of a station to supply LNG to tank trucks.

Under this agreement Dunkerque-Port will support Dunkerque LNG in its undertaking to build and then operate the supply station, as part of a larger project to set up an LNG provisioning service by land and sea in the port of Dunkirk, so making LNG available on the market.

About Dunkerque LNG

Dunkerque LNG SAS, the owner and operator of Dunkirk's LNG terminal, is owned 65% by EDF, 25% by Fluxys (an independent group of natural gas transport infrastructures, based in Belgium and present throughout Europe) and 10% by Total. The terminal was commissioned on 1 January 2017 and has an annual regasification capacity of 13 billion cubic metres (corresponding to 20% of the annual consumption of natural gas in France and Belgium), which makes it the second-largest LNG terminal in continental Europe. It is also the only one to be connected to two markets: France and Belgium. The terminal's operator is Gaz-Opale, owned 51% by Dunkerque LNG and 49% by Fluxys.

About Dunkerque-Port:

The ninth port of the Channel and North Sea Range and France's third-largest port, Dunkirk has built a reputation in many sectors: it is the largest passenger port in Europe (Calais-Dunkirk hub); the largest French port complex, with traffic of more than 90mt (million tonnes) via Calais-Dunkirk; France's largest energy hub; the country's largest LNG terminal; the leading French port for containerized fruit and vegetable imports; the largest French port for ore and coal imports; France's largest rail port; the region's largest waterway port; and the third-ranking French port for grain traffic. Dunkerque-Port is also a sustainable port. It is the trading port of the new Hauts-de-France Region, the largest agricultural region of France, the leading region for the rail industry, and the leading region for the car industry. Traffic in 2016 was 46.7mt.

Bunge consortium awarded Rio de Janeiro wheat terminal

In Brazil, the Maravilha consortium, which was put together by Bunge and M.Dias Branco, has been awarded the concession for the Terminal de Trigo (Wheat Terminal) in the Port of Rio de Janeiro. The concession is for 25 years, with the possibility for a renewal period of a further 25 years upon expiry.

In the tender organized by the National Waterways Transport Agency (Antaq), it put forward a bid of $360 million.

The RD J05 terminal involved covers an area of more than 13,000 square metres and was included in the private sector development initiative known as the 'Growth Project'. It will require investment of $28.5 million.

The total value of the contract is $158 million, with the concessionaire paying an additional $11,900 per month and $0.40 for every tonne moved.

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UBT

ABP Humber and RBT join growing ABTO membership


ABP's Immingham Terminal.

ABP Humber has joined the Association of Bulk Terminal Operators (ABTO) as a full member, in what marks a significant milestone for the newly formed trade association.

Associated British Ports' terminals in Hull, Grimsby, Goole and Immingham, which together handle more than 65mt (million tonnes) of cargo annually, contributing over £2.2 billion to the UK economy, join a growing ABTO membership-base that includes operators in the Americas, Europe and Asia.

Simon Bird, Director, Humber, ABP Ports, commented: "With developments taking place across the Humber region together with the emergence of new bulk products, such as biomass, an association capable of representing the interests of the bulk sector is important to the industry."

ABP Humber's membership to ABTO follows that of another operator located on the UK's east coast: Redcar Bulk Terminal, which operates a 32m-long quay on the South Bank of the River Tees.

Ian Adams, ABTO Chief Executive, said: "We are delighted to welcome both ABP Humber and Redcar Bulk Terminals as full members to the association. The developments being undertaken by these two terminal operators is indicative of a resurgent maritime and logistics sector across the UK's east coast. ABP Humber's Immingham terminal is the UK's largest port by volume, handling around 55mt of bulk cargoes each year, while the developments to revive West Cumbria's mining industry could benefit the Redcar Terminal, which has been earmarked to handle coal for onward transportation to Europe."

Garry O'Malley, General Manager, Redcar Bulk Terminals (RBT), said: "As one of the UK's major bulk terminal operators, joining the Association of Bulk Terminal Operators provides an invaluable opportunity to network with other terminal operators with a mutual interest in cargo handling, environmental challenges and safety."

Redcar Bulk Terminal, on the south bank of the River Tees, was part of the UK's integrated steelworks and an import facility for iron ore and coal cargoes. Following the closure of the steelworks in October 2015, RBT has continued to operate and grow as a major bulk handling facility capable of handling large Capesize vessels with draughts up to 17m. RBT currently handles imports of coal, pet coke, GBFS and aggregates and export cargoes of scrap and metallurgical coke.

"British Steel, which recently acquired a 50% stake in the business, considers the terminal a perfect strategic fit, given its coveted position in the North East," said O'Malley. "It offers a superb gateway into the industrial heartland of the UK and to businesses throughout the North of England."

The Association of Bulk Terminal Operators, established in 2015, offers bulk terminal operators the opportunity to exchange information and expertise between members on a whole range of topics, including biomass and security.


RBT's facility on the River Tees.

These and other important industry issues that will be covered in depth at Bulk Terminals 2017: Achieving Efficiency and Compliance, the Inaugural Conference of the Association of Bulk Terminals, which will take place in London between 31 October and 1 November 2017.

Cliffs Natural Resources to locate HBI production plant at Ironville Terminal


Ironville Terminal in East Toledo.

On 15 June, the Toledo-Lucas County Port Authority announced that Cliffs Natural Resources Inc. will locate its first hot briquetted iron (HBI) production plant at Ironville Terminal in East Toledo. This project has the potential to create up to 130 permanent jobs, more than 1,200 construction jobs and represents a $700 million investment in the Toledo Region. This project was made possible due to partnerships between the Port Authority, JobsOhio, Midwest Terminals of Toledo, City of Toledo, Lucas County, Regional Growth Partnership, and the Ohio Rail Development Commission.

"We are excited to add to the already substantial economic impact the Port of Toledo has on this region," said Paul Toth, President and Chief Executive Officer of the Toledo-Lucas County Port Authority. "We acquired Ironville with the intention of locating a large-scale industrial user on the site who required marine and rail capabilities, and we truly feel this project is the perfect match for the remaining portion of the site."

Lourenco Goncalves, Chairman, President and Chief Executive Officer of Cliffs Natural Resources Inc., said, "Today's announcement marks a very important strategic milestone for Cliffs as we begin to implement our plans to be the sole producer of high-quality HBI for the EAF steel market in the Great Lakes region. We look forward to the strong margin and earnings potential this new product will generate for Cliffs shareholders." Goncalves added: "We thank Governor John Kasich, JobsOhio and a number of local partners in the Toledo community for their efforts to help advance this project, including an offer of approximately $30 million in grants and other financial incentives. We will continue to work closely with the State of Ohio through the environmental permitting process, and are excited to bring a significant number of high-paying jobs to Ohio."

Cliffs Natural Resources Inc. will lease approximately 100 acres on the east side of the site from the terminal operator, Midwest Terminals of Toledo. Existing infrastructure and material handling capabilities on the site met the company's requirements for its site selection process. Construction on this project is expected to begin in early 2018, with the production of commercial tonnage of HBI beginning in mid-2020. Cliffs Natural Resources Inc. will receive more than two million tonnes of product, delivered by vessel, for the production of HBI, and has the potential to add 100 new vessel calls per year at the Port of Toledo. The finished product will ship from the facility via truck and rail.

"As with any company interested in locating or expanding here, our people came to the table nimble and ready to work with Cliffs. We are committed to continuing to work with this company to move the project forward," said Mayor Hicks-Hudson.

"The Lucas County Commissioners are excited to be a part of this opportunity for redevelopment of the Ironville site. This investment is a game changing opportunity for Lucas County and our workforce. Transportation is our most competitive advantage and this project proves it. The partnerships we have fostered over many years with the Port Authority and other public and private entities is the gold standard in Ohio and we look forward to working with Cliffs to ensure our workforce is ready for these exciting new jobs," said the Lucas County Commissioners.

About Ironville Terminal

Ironville Terminal, formerly known as the Chevron property, was purchased by the Toledo-Lucas County Port Authority in 2008. The Port Authority formed a public-private partnership with Midwest Terminals of Toledo through a long-term lease for the property. The acquisition of Ironville Terminal made the Port of Toledo the largest land mass seaport on the Great Lakes. Approximately $18 million has been invested in the site to date. The Port of Toledo supports 7,000 jobs and has an annual economic impact of over $1 billion on the local economy.

About Cliffs Natural Resources Inc.

Cliffs Natural Resources Inc. is a leading mining and natural resources company. Founded in 1847, Cliffs Natural Resources Inc. is recognized as the largest and oldest independent iron ore mining company in the United States. The company is a major supplier of iron ore pellets to the North American steel industry from its mines and pellet plants located in Michigan and Minnesota. Cliffs also operates an iron ore mining complex in Western Australia. Driven by the core values of safety, social, environmental and capital stewardship, Cliffs' employees endeavour to provide all stakeholders operating and financial transparency.

Dry bulk traffic down or flat on US West Coast

The Northwest Seaport Alliance comprises the ports of Seattle and Tacoma.

Barry Cross

The Northwest Seaport Alliance is the port authority based in Puget Sound, in Washington State, comprising the ports of Seattle and Tacoma. It is the tenth-largest cargo port in the US.

According to John Christensen, the ports' Sr. Business Development Manager for the port's Non-Container book of business, the Alliance handles both breakbulk and bulk commodities.

"In 2016, 181,372 metric tonnes of breakbulk cargo moved across our docks, a 23% decrease from the previous year. Log volumes totalled 176,928 metric tonnes, or 24,921,280 board feet for the year, a decrease of 25% from 2015," reports Christensen.

Some of the factors influencing volumes in 2016 included reduced demand from China due to a decline in the number of construction projects taking place in that country, a strong US dollar and the changing geo-political landscape.

"Containership overcapacity and low container freight rates also fuelled competition for what have been traditionally breakbulk and bulk cargo. For example, we have seen a considerable increase over the last couple years in the volume of logs being shipped via container," he says.

For the first four months of 2017, breakbulk volume amounted to 55,119 metric tonnes — a 9.8% decrease from last year. Log exports are up 165% to 94,547 metric tonnes.

"For 2017, log volumes to China are rebounding due to an uptick in construction projects in that country. Headwinds persist, however, as slow growth in international trade, and the changing political climate — with the possibility of increased tariff and duties for logs — may impact overall volume," says Christensen.

In respect of star commodities, he again picks out log volume to China, which has been consistent as construction projects continue in that country. The breakbulk side continues to remain soft in 2017, although he states that the Alliance is seeing

The Northwest Seaport Alliance handling logs.

increased activity and is hopeful for increased demand.

"We are always interested in discussing new projects; however, we want to ensure we meet and exceed the needs of our existing clients first," he says.

Quizzed about capacity for dry bulk and breakbulk volumes, Christensen points out that this depends upon the client opportunity.

"We work to stay aligned to their needs and invest accordingly," he says.

In respect of vessel size, the average bulk carrier for logs tends to be around 35,000dwt.

"Ships are definitely getting larger. In 2016, for example, we received a call from Pacific Basin Shipping's *Olive Bay*, reputed to be the world's largest single-deck bulk/log carrier. It called at our South Harbor (Tacoma) log terminal."

Landside movement of logs is mostly undertaken by the road haulage industry, while some added value of logs does take place in the South Harbor, where they are debarked prior to being dispatched to Asia.

Further south, the Port of Bellingham, which is located in the mid point between Seattle and Vancouver, in Washington State, has not handled bulk cargoes in the recent past, reports Chris Clark, the Marine Terminals Business Development Manager. However, he says that it is now gearing up to receive bulk commodities in the very near future.

"Recent improvements include the ability to handle Handysize up to Supramax tonnage on available draughts of 34 (10m) to 38 ft (12m) of salt water," he says.

The port has the capacity to store up to 16,000 metric tonnes of cargo in two enclosed warehouses adjacent to the

dock. Equipment includes a 80 metric tonne crane and availability of hoppers and conveyors on request, adds Clark.

"Port facilities are adjacent to a major trucking route, very close to Interstate 5 and 20 miles (32km) from the Canadian border," he says.

In addition, the port owns a variety of warehouse facilities adjacent to the Shipping Terminal which are available for both short and long term lease.

As for the Port of San Francisco, it handled 1,378,848 metric tonnes of dry bulk in 2016, compared to 1,496,072 the previous year.

"2015 was a five-year high so 2016 coming back down slightly was not a surprise," says the port's maritime marketing manager Brendan O'Meara, who adds that, "The large amount of construction going on in San Francisco has been a key factor in driving volume growth over the last couple years."

As for 2017, dry bulk traffic has been consistent with the previous few years as construction and large projects in San Francisco continue to be a strong influencer.

In terms of commodities, aggregates are doing well because of the continued growth and construction in both downtown San Francisco and the surrounding areas.

Asked whether the port is actively seeking any new dry bulk commodities, Mr O'Meara says it is. "We have a deep water berth at our Pier 96 facility which would be ideal for a dry bulk commodity," he says.

Quizzed as to the size of vessel deployed on dry bulk trades, he says these are usually around the 70,000dwt mark, in other words Panamax bulk carriers.

"Our landside movements of dry bulk

commodities almost all go by road," he comments.

Finally, in respect of adding value to shipments prior to either despatch by sea or moving to the final customer by road, Mr O'Meara points out that, in very close proximity to Pier 94, there is actually a concrete plant where aggregates are imported.

In southern California, the Port of Long Beach has several dry bulk handling facilities, with the Metro Ports terminal being the main one, handling mostly exported petroleum coke, coal, potash, borax, sodium sulphate, soda ash, concentrates and prilled sulphur. In addition, there are two established import cement terminals, operated by Mitsubishi Cement and Cemex USA respectively, while bulk gypsum is handled by G-P Gypsum at a 3.6ha gypsum facility on Pier D and by the National Gypsum Company at its 7.6ha Pier B facility. Mortons Salt has a bulk salt terminal on Pier F, while SA Recycling has a recyclable metal and steel products terminal. Finally, Koch Carbon specializes in prilled sulphur and pet coke at its facility on Pier F.

In 2015 and 2016, it was Metro Ports that handled most dry bulk, with volumes reaching 6.4mt (million tonnes) in 2015 and 6.3mt last year. It has a 9.3ha terminal on Pier G.

According to business development manager Brett Mascaro, overall dry bulk volumes were flat last year.

The port reports that the first quarter of 2017 was up 31% in terms of dry bulk. In Long Beach, a lot of the traffic is essentially captive to the port, since it is used by local refineries, making products like petcoke and sulphur. The port reports that in the first quarter 1.971mt had been handled.

Comparing dry bulk traffic trends over the last two years, Mascaro says there is some small percentage growth in both petcoke and sulphur. Gypsum, in contrast, is down, as is coal, but not dramatically so.

"In terms of new commodities, the Port of Long Beach is always open for new business and we are always interested in pursuing new opportunities. We are always talking to our customers, looking to match their facilities with opportunities in the market," he says.

The port reviews capacity needs on an ongoing basis, and has recently been through a Port Master Planning Process. This is a three phase effort, of which the first phase — a cargo growth forecast — is now complete. This initiative, done in conjunction with the Port of Los Angeles, assessed cargo growth over the next two decades. The next step is to align those projections, with land use resources. Opportunities to make better use of existing land are therefore under review, which will eventually result in an updated port masterplan.

"Our operators are also looking towards the future. One example of that is Mitsubishi Cement, which has just undergone an extensive environmental review process for their terminal. That has cleared the way for new storage facilities to be built there. They also intend to add some new environmental enhancements to reduce emissions," he says.

In terms of vessel size, Long Beach sees vessels mostly in the 60,000dwt to 75,000dwt range, with Mascaro commenting that there has not been too much variation in this in recent times. Dry bulk tends to be moved by chartered vessels, and these are chartered depending on rates and commodity prices inherent at any one time.

Landside, both road and rail are used to move dry bulk consignments, with on-dock rail links to the main terminals. There are rail car dumps in terminals for those wishing to export, with shiploaders putting product directly into vessels, too.

Local business tends to favour movement by consignments of road, with all pet coke moved by trucks.

As for value added services, this is not a major feature at Long Beach. However, the Metro Ports terminal does have blending facilities available for petroleum coke.

"In general, we pride ourselves on being a full service port and we embrace cargo diversity and we are always looking for new business opportunities in the dry bulk market whenever these present themselves," says Mascaro. DCi

FLSmidth signs large cement plant contract in North Africa

FLSmidth has signed a contract for a state-of-the-art cement plant valued at more than €100 million. The contract includes engineering, equipment supply, construction supervision, commissioning, and training.

Located in the North Africa region, the plant will mainly supply cement to its local market. Once completed, the cement plant will have a capacity of 12,000 tonnes per day.

"We are extremely proud to have been chosen as the preferred supplier of this cement plant. It marks the culmination of a close collaboration between the customer and FLSmidth, enabling us to deliver a state-of-the-art cement plant based on our experience and competencies from the cement industry, our global presence, and the know-how of our 12,000 employees in delivering productivity enhancing solutions. North Africa is a very important market to FLSmidth and we have previously supplied several cement plants across the region," said Per Mejnert Kristensen, Group Executive Vice President, Cement Division.

The contract is worth more than €100 million and is among several other conditions subject to receipt of the down payment by FLSmidth.

MacGregor & ESL Shipping develop and test autonomous discharging feature on bulk cranes

MacGregor, part of Cargotec, and ESL Shipping Oy, part of Aspo Plc, have agreed to jointly develop and test an autonomous discharging feature on MacGregor bulk handling cranes. It is designed to offer safety and efficiency advances. The cranes will be fitted on board ESL Shipping's two new liquefied natural gas-powered Handysize bulk carriers.

"Autonomous crane operation improves efficiency and safety," says Leif Byström, Senior Vice President, Cargo Handling at MacGregor. "Discharging operations can be monitored and controlled from the bridge and therefore eliminate the need for personnel in hazardous operational areas."

"Our new environmental friendly LNG-fuelled ships will be operated in very demanding trade with high number of voyages, port calls and crane operation hours annually. Autonomous operation will further increase our competitiveness and offer our clients unforeseen efficiency and safety," says Mikki Koskinen, Managing Director at ESL Shipping Oy.

"We are very excited about collaborating with ESL on this development project," continues Byström. "By combining the expertise of a forward-thinking shipowner and operator with our expertise in intelligent cargo handling, we can reduce unnecessary waste in the value chain and therefore develop safer and more efficient solutions for unloading bulk cargoes."

The vessels are planned to enter service during the second quarter of 2018, when automation testing will commence.

MacGregor shapes the offshore and marine industries by offering world-leading engineering solutions and services with a strong portfolio of MacGregor, Hatlapa, Porsgrunn, Pusnes and Triplex brands. Shipbuilders, owners and operators are able to optimize the lifetime profitability, safety, reliability and environmental sustainability of their operations by working in close cooperation with MacGregor.

MacGregor solutions and services for handling marine cargoes, vessel operations, offshore loads, crude/LNG transfer and offshore mooring are all designed to perform with the sea.

MacGregor is part of Cargotec. Cargotec's sales in 2016 totalled approximately €3.5 billion and it employs over 11,000 people.

Bedeschi supplies shiploader to AdvanSix plant in Virginia, USA

Bulk handling equipment specialist Bedeschi has supplied a 500tph (tonnes per hour) shiploader to the AdvanSix Plant in Hopewell, Virginia, USA. This shiploader, which will be used to load/unload ammonium sulphate at the AdvanSix (formerly Honeywell) plant, will replace the 40-year-old unit previously in use.

With a capacity of 500tph, and with a unique design — the only one in the world — with a double telescopic boom, the new machine allows the client to load bigger ships than ever before, up to 32,000dwt and 28m wide completely covering the ship, and enabling maximum efficiency in terms of volume and time.

All of the conveyor belts are completely enclosed, to prevent material spillage. The telescopic chute, installed on the top of the boom, prevents dust emissions during loading activities.

Due to the corrosive nature of the material to be handled, all the parts exposed to said material are made of stainless steel. One of the main parts, the boom shuttle, has been made using special DUPLEX stainless steel.

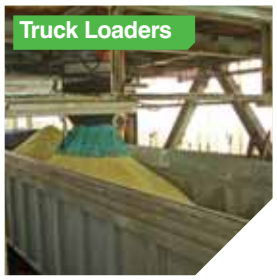
The entrance walkways are in aluminium, either to enable resistance to corrosion or for weight reduction.

One of the main restrictions of the project was the reduced loading capacity of the quay and the reduced rail clearance that required detailed and in-depth structural analysis and stability calculations.

The design of the machine allows safe control of the air-conditioned cabin which is equipped with a professional seat, granting the highest visibility to the operator of the loading point.

Cleveland Cascades Ltd

Global leader in bespoke dry bulk loading chutes



Cleveland Cascades are Specialists in the design and manufacture of bespoke dry bulk loading chutes.

Our bespoke solutions are designed to meet each customer's specific requirements from a tool kit of proven components, utilising the expertise of a team of specialist in house design engineers.

We lead the loading chute industry & set the standard for dust emissions and environmental pollution control in dry bulk handling.

Our worldwide reputation is built on high quality, well-engineered, robust, high performance chutes, backed up by excellent customer service and global lifetime product support.

Contact Cleveland Cascades Ltd

Unit 22, Dukesway, Teesside Industrial Estate, Thornaby, Stockton-on-Tees, Cleveland, TS17 9LT, United Kingdom Tel: +44 1642 753260 | Fax: +44 1642 753270

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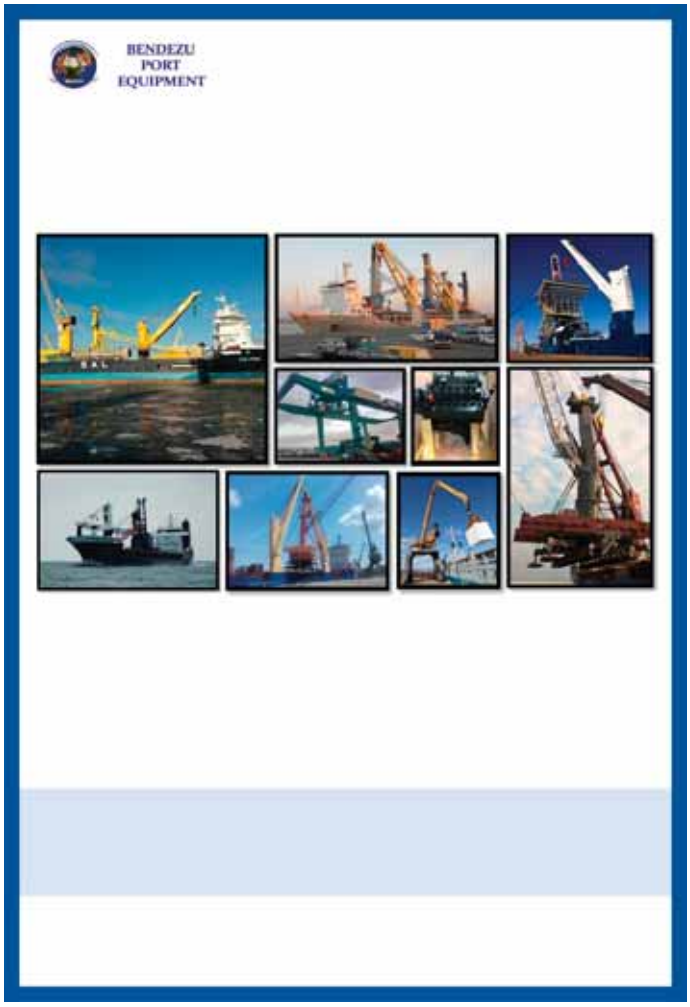
TSUBAKI KABELSCHLEPP presents global innovation

CABLE CARRIERS FROM THE TKHD SERIES: DESIGNED FOR HEAVY DUTY APPLICATIONS WITH LONG TRAVEL LENGTHS AND HIGH LOADS

With the new TKHD series, TSUBAKI KABELSCHLEPP has developed extremely robust and stable cable carriers which are particularly suitable for the crane industry and other demanding applications with long travel lengths — for example in the bulk goods area. The sturdy design of the TKHD cable carriers makes them ideal even for use in dirty and rough environmental conditions with a long service life.

"Cable carriers for cranes are one of the main focus areas of TSUBAKI KABELSCHLEPP," Peter Sebastian Pütz, Head of Crane Business at TSUBAKI KABELSCHLEPP, explains. "The TKHD series now adds a real powerhouse to our range in this area — a first on the market." With the encapsulated stroke system, a dirt-resistant outer contour and a reinforced bolt hole connection, the cable carrier meets the highest requirements with regard to robustness. The solid sidebands are highly sturdy thanks to a special double-fork and tab design. Quiet running is ensured by an integrated brake and integrated noise damping, whereby the latter works continuously in the chain radius as well as in the straight length. The pitch of 90mm and the polygon-optimized outer contour support the quiet running of the cable carrier: "Plastic cable carriers of this size with a smaller pitch were previously not available in the industry, so we are filling a gap in the market," Pütz says.

With an inner height of 87mm, the width of the TKHD series can be precisely adapted to the available space: aluminium stays in 1mm increments make it possible. The vertical inner distribution can also be changed flexibly thanks to fixable dividers. Users also benefit from fast installation: The cable carriers can be quickly opened inwards and outwards for installation of cables and hoses. The TKHD series is designed so it can be used gliding, rolling and also unsupported. If the cable carriers are used gliding, replaceable glide shoes ensure an extended service life of the system.



Spanish port operator Noatum adds another Konecranes Gottwald mobile harbour crane to its fleet

Noatum Terminal Castellon, part of the leading Spanish port operator Noatum Maritime, has added another Konecranes Gottwald mobile harbour crane to its fleet. The Model 6 machine was put into operation in May in Castellon, where it handles mainly bulk but also a number of other cargo types.

The new 125t diesel-electric machine will contribute to the further growth of the terminal, situated some 80km north of Valencia.

Joaquin Ramon Lestau, CEO, Noatum Terminal Castellon, said: "With this Model 6 crane, we aim to extend and optimize our bulk activities. As we also offer all kinds of cargo handling services in our terminal in Castellon, the machine will allow us to load and unload all kinds of commodities including project cargo and containers. Given this variety of tasks, it was logical to opt for the particularly versatile mobile harbour crane technology from Konecranes. Moreover, since Noatum already operates seven Konecranes Gottwald mobile harbour cranes of different sizes and generations in other port terminals, this new investment proves, beyond any doubt, how we value the reliability of the machines from Konecranes."

Giuseppe Di Lisa, Sales & Marketing Director, Mobile Harbor Cranes, Konecranes, commented: "For more than 15 years, Noatum has regularly ordered Konecranes Gottwald mobile harbour cranes. We are proud that a long-term customer and leader in its market continues to rely on our technology. The fact that the machine will handle a wide range of cargo types, confirms once again one of the key benefits of our mobile harbour cranes, which is their high degree of versatility." The Model 6 crane is a Konecranes Gottwald mobile harbour crane belonging to the large crane family. The G HMK 6507 B four-rope variant for Noatum offers a maximum lifting capacity of 125t, a 50t grab curve and a maximum outreach of 51m.

Konecranes is a major global group of Lifting Businesses™, serving a broad range of customers, including manufacturing and process industries, shipyards, ports and terminals. Konecranes provides productivity enhancing lifting solutions as well as services for lifting equipment of all makes. In 2016, group (comparable combined company) sales totalled €3,278 million. The group has 17,000 employees at 600 locations in 50 countries.

New product from General Kinematics: High Frequency Feeder and Screen

General Kinematics is proud to announce the latest addition to its Feeder and Screen lines, the High Frequency Screen or Feeder. This innovative design showcases GK's new patent-pending, structural springs that provide both spring rate and direction, taking on the roles of rocker legs and springs. The smaller size of the high-frequency motor provides for a more cost-effective solution in comparison to a brute force machine, yet still capable of operating at near natural frequency. One more factor adding to the cost reduction of the High Frequency Screen or Feeder is the minimum need for isolation due to the low strokes and simple design. Not to mention among a variety of materials, the trough is available in food grade stainless steel.

The benefits of high-frequency vibration

High frequency vibration has many benefits and is oftentimes a better fit for certain applications. For instance, fine screening is better accomplished at a high frequency vibration because of its tendency to fluidize material, which is also an asset when spreading a pile. The combined effort of the motor and structural springs allow for high spring rate in a smaller space which may be a good solution for those with minimal available area. The High Frequency Feeder or Screen can even sit directly on the floor with no foundation requirements. Due to the low stroke startup and shutdown transfer point, very little clearance is needed providing little chance of pinched fingers and other injury.

Why high-frequency over brute force?

The key differentiator between high frequency and brute force motors is flexibility. Brute force designs can be limited in length by the effect of vertical deflections. General Kinematics' patent pending Structural Spring enables a design to better distribute driving forces down the length of the unit. This reduces cantilever length, unintended deflections, and stress thereby making it possible to design longer high frequency units. Of course, that is not the only benefit to the GK high frequency design. It is also safer, load responsive, cost effective, and has a smoother start and stop. The High Frequency Screen or Feeder is built to fit the needs of the user.

FLSmidth collaborates with Goldcorp on EcoTails™

FLSmidth collaboration with Goldcorp to eliminate conventional slurry tailings dams

FLSmidth will be working with Goldcorp to develop EcoTails™, a new system to dramatically improve tailings and waste rock disposal while economically processing mine waste and increasing water recovery and reuse by as much as 90–95%.

Together with the world's third-largest gold miner, Goldcorp, FLSmidth is co-developing a system for co-mingling dewatered tailings with waste rock in a continuous process. Designed specifically for large scale mining applications, the system is expected to be environmentally safer for managing tailings and waste rock storage and has the potential to eliminate conventional slurry tailings dams completely. Combined with FLSmidth's co-developed filter press dewatering technology, co-mingling is the missing piece of the puzzle to keep costs low for dry stacked tailings. "As water resources become increasingly scarce and mining dams grow globally, so do the risks," says Todd Wisdom, Director of Tailings Systems, FLSmidth. "We believe that the target for the industry is to completely eliminate tailings dams, and to recirculate maximum water back to the process. Highly dewatered tailings is the sustainable route for tailings disposal, and our work with Goldcorp will help EcoTails™ develop into both a technologically viable and economically feasible solution for large-scale mining."

The solution is being studied for full scale testing at Peñasquito, Goldcorp's largest mine, with an average daily throughput of 130,000 tonnes/day. Co-mingled waste disposal has previously only been used at small scale mines using dozers, trucks, high cost liquid-solid separation processes, and significant manpower, making the solution too costly for large-tonnage operations.

By using materials conveyance as the energy source for the mixing, Goldcorp and FLSmidth are testing a low energy, low cost co-mingling solution, with the waste blended in transit using specially designed material handling technologies. This method will make the solution economically competitive with traditional tailings disposal methods for large mines.

The method of co-mingling tailings with mine waste in a continuous process produces a new type of waste called GeoWaste™. The filtered tailings cost is minimized by using fast filtering technology and waste rock to provide additional strength to the blended material.

The risk of acid rock leaching from the waste rock is minimized by filter cake filling the voids of the waste rock matrix, greatly reducing oxygen flux. Once the system completes testing it will be offered commercially by FLSmidth.

On track with rail & barge handling

Louise Dodds-Ely

Efficient barge unloading with Sumitomo's continuous unloading technology

Indonesia is a major coal producer. However, since many of the deposits are located inland, coal needs to be transported by barges using the nearest waterway. As a result, most coal cargoes are moved by barge to where they are needed, these being large export terminals, offshore transshipment vessels or directly to domestic users. Barges typically range from 5,000 to about 15,000dwt, with all the coal carried on deck. For coal delivered to domestic users in such barges, some unloading equipment is needed and a variety of such equipment can be found throughout Indonesia.

Smaller users often resort to using multiple hydraulic excavators to unload coal into trucks parked alongside the wharf where the barge is tied up. However, this requires significant manpower to drive the excavators. It is also not an efficient way to operate, and a lot of coal is spilled on the wharf. P.T. Semen Tonasa, located just north of Makassar in Sulawesi, was one of these operations. This user operates a large cement plant as well as power stations to run the plant, and needs a steady stream of barges in the 10,000dwt class to provide the necessary fuel. With a new power generating plant coming on stream, Semen Tonasa predicted the need to increase its unloading capability by switching to more efficient and practical equipment.

Semen Tonasa chose Sumitomo's continuous barge unloader for this task and the 1,200tph (tonnes per hour) unit was successfully put into service in June 2013. The unit was installed on a dedicated jetty, allowing barges to berth on both sides. The unloader is of the bucket-elevator type and the design is derived from Sumitomo's highly efficient ship-unloader design, but adapted to the particular way coal is carried on the barges. The design had to:

- provide a simple bucket elevator design, as there is no hatch overhang to reach under;
- ensure efficient digging into the conical piles of coal on the barge; and
- enable the bucket chain to operate in catenary mode to facilitate bottom clean-up. The resulting design is shown in the photograph above. The bucket elevator digging head is of a triangular shape which can be tilted to have better contact with the conical piles.

The bucket elevator chain can also be operated in Sumitomo's signature catenary mode, proving effective bottom clean up to minimize bulldozer work and reduce overall unloading time.

Since installation, the continuous barge unloader has proven to be reliable and efficient, providing a stable stream of coal, reducing barge turnaround time and mostly eliminating barges waiting to be unloaded. This type of continuous barge unloader can bring great rewards to operators in the region who need to unload similar barges quickly, efficiently and cleanly.

Kinshofer attachments for loading railcars – and working on railtracks!

Rail loading of dry bulk cargoes is made easy with the use of grabs from the German company Kinshofer GmbH. The company, headquartered in Waakirdien/Marienstein in Germany, is represented throughout the world with a range of subsidiaries and sales offices.

Kinshofer GmbH is one of the leading manufacturers of attachments for loader cranes and hydraulic excavators as well as for rotators, Tiltrotators and rotary actuators. Originally named Kinshofer Maschinenbau Miesbach, the company originally produced only bridge bearings, handrails and accessories for brick factories, such as tunnel kiln trucks or lifting and lowering devices for tile presses. Two years after the company's founding the development of the first brick stack grapple began. Just one year later; the construction of a pallet fork and a clamshell bucket followed.

The company changed its name to Kinshofer Greiftechnik GmbH in 1980, and the first sales activities in the United States and the UK took place.

In 1984, the first foreign sales subsidiary of the company was founded in Stockport, Cheshire, England: Kinshofer UK Ltd. The company is now represented around the world, including Austria, the Czech Republic, Sweden, the Netherlands, China, Finland, New Zealand and the USA.

One major breakthrough that has boosted Kinshofer's reputation further is the development, in 2003, of its HPXdrive. This hydraulic drive unit, characterized by its constant closing force, is optimally force, is optimally suited for daily operations in general construction, civil engineering and landscaping. Thanks to its constant closing force, the HPXdrive is ideal for difficult tasks.

Kinshofer rail cutter.

In contrast to conventional hydraulic grabs, with the HPXdrive the torque is generated by two hollow shafts, which run opposed and have a helix thread, hydraulically driven by a single piston.

The force is delivered to two shafts, on which the shells are mounted. These advantages of the HPXdrive technology provide an extended service life and higher efficiency.

The compact design of the HPXdrive without open greasing points allows for operations in water protection areas, as no lubricant can be washed out.

As well as providing grabs that can be used to load railcars — and barges — Kinshofer GmbH's wide product range includes attachments that can be used for railtrack construction, railtrack maintenance and scrap rails. There is hardly another invention that has changed the transport system as much as the railway. Railroads continue to play a large role in the transport of people and products around the world. It is therefore vital that railways are kept operational and safe. Whether it is for construction, maintenance, or demolition of railtracks, Kinshofer's range of attachments can meet every demand, from sleeper layers and ballast tampers, to large mobile rail cutters.

VIGAN's answer to a fluvial Europe

200tph/132kw VIGAN pneumatic barge unloader, installed at Grands Moulins de Corbeil in France.

With an overall length of 38,000km, the vast river network in Europe — and not least in France, Germany, the Netherlands and Belgium — represents more than ever a very attractive way of transporting bulk goods and grains.

Reliable, economical, ecological and safe, the advantages of fluvial transport compared to road are numerous:

- lower cost per weight of unit transported;
- lower carbon footprint: one 2,000dwt barge (a typical river vessel) does the work of 65 30-tonne trucks on congested roads;
- reduced noise level in urban areas, where the demand for goods is vast;
- reduced risk of contamination and damage to the bulk goods;
- no dust emissions during unloading;
- reduced labour cost as only one operator is needed for unloading; and
- reduced number of handling operations, thus ensuring greater security in the total bulk goods transport chain.

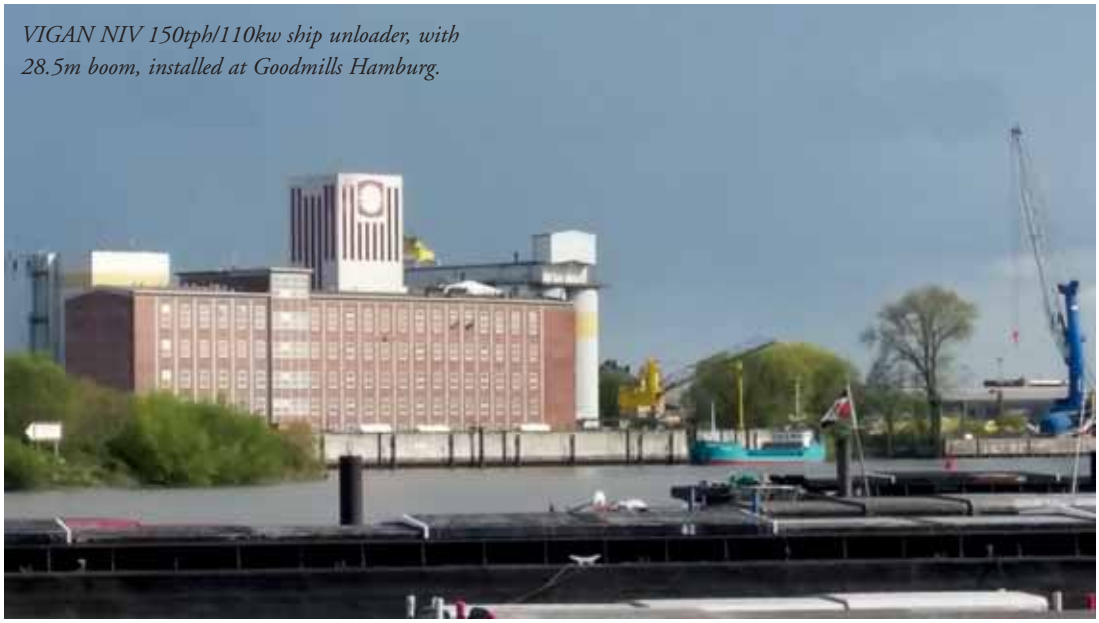
With road congestion becoming more prevalent all over Western Europe — in addition to fuel costs, CO_2 emissions, the risk of accidents, etc. — it is no surprise that ever more wheat and corn is being transported by barge.

Even though public financial incentives are still too low to guarantee this trend, the above concerns have already created great new opportunities.

VIGAN PNEUMATIC BARGE UNLOADER

In order to further promote fluvial transport and facilitate the unloading of the typical barge sizes, which range from 500 to 4,000dwt, almost 30 years ago VIGAN developed its pneumatic barge unloader concept. It has been fine-tuning the unloader's design ever since. VIGAN's pneumatic barge unloader is a powerful unloading system and is fully compatible with the scope above. It is generally mounted on a fixed gantry (mobile systems are also possible). Capacities can range from 100tph (tonnes per hour) to 600tph handling grain.

The heart of the system is the multistage VIGAN®-designed turbine. The turbine is directly driven by a high revolution electrical motor with frequency inverter steering. Thanks to this configuration, energy consumption is kept low — recent systems



VIGAN NIV 150tph/110kw ship unloader, with 28.5m boom, installed at Goodmills Hamburg.

have energy consumption records as low as 0.6kWh/tonne grain.

The powerful vacuum created by the turbine sucks in the cargo at impressive tonnages per hour. In order to unload ships in the most versatile way, the tower consists of a horizontal and a vertical telescopic tube system. At the near end of the vertical telescopic tube is the suction nozzle.

It is an ingeniously designed coaxial tube system, allowing air to come in from the outer ring above the cargo, making a turn in the cargo to the inner tube, thereby transporting the cargo through airlift into the vertical and subsequently horizontal telescopic tube. The elbow between the vertical and horizontal tube is of the highest wearing resistance (records show the handling of more than eight million tonnes of grain with just one elbow).

Both the vertical and horizontal tubes are steered by electrical hoists. The boom carrying the suction tube system is mounted on a receiving bin with a powerful self-regenerating filter: no dust emissions are possible. To maximize reach when unloading the hatches on the barge, the receiving bin is mounted on a slewing ring. The boom can be elevated by an ultra-safe hydraulic jack: there is no risk of 'breaking'. By gravity, the grain is finally transported through the air-lock system into a conveyor system, ready to be stored or processed directly by the customer.

For this range of unloaders, VIGAN is focusing its continuous investment in R&D on reducing power consumption. The pneumatic ship-unloaders are already known as the most efficient for unloading barges (i.e. the quickest way to empty a vessel), and VIGAN unloaders are combining this positive element with a power consumption not higher than 0.6 KWh per tonne. In this case, there is no need for high capacity unloaders when barges are only 250 to 3,000dwt. Industrials are focusing more on reliability and total cost of ownership than high capacity.

Partners of choice in France and Germany

With France owning the longest network of inland waterways in Europe (8,500km), the French milling group Soufflet well understands the economical and ecological impact of fluvial transport, and it uses it as an integral part of its daily logistic challenges.

VIGAN has already supplied several machines to the Soufflet group: Malteries d'Alsace in Strasbourg, Grands Moulins de Pantin, Ceres in Brussels, Socomac in Rouen and so on.

In 2016, VIGAN also installed a pneumatic barge unloader with a capacity of 200tph at Grands Moulins de Corbeil in France (South of Paris), to discharge wheat from barges.

The unloader is built on a fixed structure and is equipped with a 15m boom.

It is equipped with a three stages centrifugal turbo blower with direct drive, controlled by a frequency inverter, with a main electrical motor of 132kW/400V.

Germany is not far from France, with a total of 7,339km of inland waterways. In particular, the Port of Hamburg plays today an important role in the development of foreign trade in Germany, but also in Northern, Western and Central Europe thanks to the management of an important part of the freight to or from Poland, Czech Republic, Hungary, Austria, Germany and Denmark.

For instance, each year, around 185,000 tonnes of cereals are ground in Goodmills Deutschland's Hamburg factory (formerly Kampffmeyer – Aurora Milling Group). For the discharge of grain, VIGAN has installed an NIV-type stationary pneumatic ship unloader that discharges grain by gravity onto a wharf conveyor at a rate of 150tph.

It goes without saying that a revival of fluvial transport in the EU has created excellent new opportunities where VIGAN has made the necessary efforts to acquire a major share.

VIGAN NIV 150tph/110kw ship unloader, with 28.5m boom, installed at Goodmills Hamburg.

LAIDIG

Pioneering Reclaim Solutions

PIONEERING SPIRIT

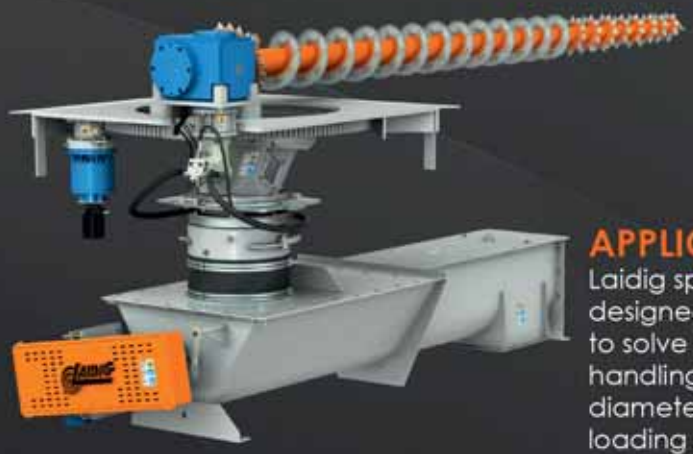
With over 50 years of pioneering innovations, Laidig is recognized world-wide as a leader in the bulk storage and material handling industry. Laidig is continually involved in cutting-edge development to offer customers the best solutions for their storage and reclaim needs.

EXPERTS IN

MATERIAL HANDLING SOLUTIONS

FULLY AUTOMATED TURNKEY SYSTEMS

Laidig's turnkey storage and reclaim systems offer superior material handling performance and dependability in the harshest environments.

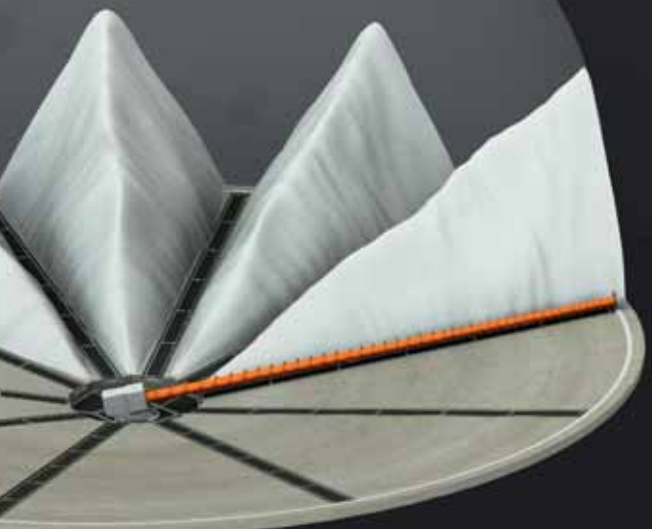


APPLICATION SPECIFIC

Laidig specializes in custom-designed and engineered systems to solve all of your material handling needs, including large diameter applications to assist in loading ships at port facilities.

EXCEPTIONAL ENGINEERING

Laidig's systems are engineered to provide **completely automated, near-total clean out,** while maintaining first-in-first-out (FIFO) material distribution.



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KRÖGER grabs for bulk handling in railway and barge terminals

The KRÖGER KZH hydraulic grab in barge operation.

Special conditions demand light and environmentally friendly grabs

Barges and trains play an important role in moving bulk goods from seaports to the hinterland, and vice versa.

KRÖGER is known for producing grabs which have been in operation in almost all German ports and harbours for a long time, both on the coast, e.g. in Hamburg, Brunsbüttel and Bremen, or in inland barge terminals such as Duisburg, Düsseldorf, Cologne, Andernach and Ludwigshafen. Furthermore the company's grabs can be found in railway terminals as well as in bulk handling facilities of the industry.

Due to the size of the handling equipment in barge and railway terminals, the grabs needed are normally smaller than the ones used in seaport operations. In order to still achieve economical operations in these conditions, KRÖGER engineers optimized the grabs in terms of weight and size, according to the individual customer requirements. Besides the well-known rope or motor grabs, more and more often hydraulic grabs attached to the material handling machines can be found. High numbers of cycles per hour — and the additional impact due to the fix connection to the basic machine — require an especially sophisticated design of these hydraulic grabs if a long life time is also to be achieved.

The legal requirements on the terminal companies in terms of bulk handling are becoming increasingly important with regards to emissions. The fact that many of the barge and railway terminals are situated in the vicinity of residential areas makes it all the more imperative to avoid environmental impacts such as dust formation and ground water pollution.

KRÖGER provides an overview of the necessary requirements on future-orientated, ecologically responsible loading grabs. There are mainly three areas in a grab that need to work in an eco-friendly manner: the specifically raised grab jaws, the grab edges and the hinge bearings.

KRÖGER grab's jaws are raised above the angle of repose so that the often there is no opportunity for strong winds to affect the conical piles and, consequently, the light, dust-forming bulk goods. This is an ideal solution to the problem of material being blown away.

KRÖGER KZHG enclosed grab for dust-free handling of bulk goods.

When handling free flowing material, greater efforts in terms of structure and design are needed to ensure tight operation, even under extreme loads and continuous and long-term usage. It is possible to achieve tight closing of grab jaws with 90% of materials, by using a double Pantanax round-bar steel, both on the bottom as well as on the side blades of the scoops.

In cases where tight closing of grab jaws by bedding in the Pantanax round-bar steels is not sufficient (e.g. aluminium oxide) tight closing is achieved through a rubber seal. Here, an open profile from the opposite grab jaws presses into a replaceable rubber lip (foamed rubber with hardness number of 20 Shore) during the closing operation. The rubber fits up to one-hundredth of a millimetre into the open profile and, in this way, prevents any loss of the special bulk load due to trickling. The rubber lip itself is protected against damage by means of a Pantanax round-bar steel mounted all around.

Also becoming increasingly important is the need to protect the environment from oils, greases and lubricants, which could squeeze out of the hinge bearings and fall of to the ground or into water. This is totally avoided by the use of KRÖGER ZERO-maintenance bearing technology, which dispenses with the need for time-consuming and annoying lubrication procedures. Undesirable follow-up costs are also eliminated.

In this way, KRÖGER shows that grabs can meet both, economic and ecological requirements in bulk handling in barge and railway terminals.

KRÖGER Greifertechnik GmbH & Co. KG is a manufacturer of grabs based in Sonsbeck/Niederrhein in Germany. Its core products include rope, motor-hydraulics and hydraulic grabs. The target markets are, in particular, customers in the sectors of sand and gravel extraction, ports and general bulk handling as well as waste incinerator plants. End-users and distributors at home and abroad are among its customers.

In, out and on its way: barge unloading paired with a DomeSilo™

Key to efficient energy production in Martinique

For energy-producer Albioma to build Martinique's first 100% biomass power plant, the company needed bulk storage and ways to get product into and out of the structure, *writes Rebecca Long Pyper for Dome Technology.*

So Albioma contracted Dome Technology to build a single DomeSilo™ standing 33 metres tall and 35 metres in diameter at the port of Fort-de-France with the ability to store as much as 19,900 metric tonnes of wood pellets.

Historically, diesel has been utilized as an energy source for the island, and in contrast Albioma will rely on environmentally friendly sugar-cane bagasse as the primary energy source for its power plant. But since available bagasse will not meet energy demands, the wood pellets will act as supplemental fuel for the Albioma plant.

The DomeSilo's geometry and construction will help it weather extreme storms common on the island.

Energy-producer Albioma selected a dome to store wood pellets for its power plant in Martinique.

The pellets are delivered to the island via ship, where a barge unloader conveys the product into the top of the dome. The pellets can then be stored as long as needed.

Dome Technology often facilitates the selection and installation of loading and unloading equipment, resulting in less work for the customer and a seamless storage and handling facility. The Albioma dome includes a barge unloader and truck load-out systems for getting product into and out of the structure.

One advantage of working with Dome Technology for this project was the ability to maximize space. Based on construction methods, materials and geometry, the dome stores more product on a smaller footprint than traditional storage options. Also, the barge-unloader geometry was designed to fit the tight space between seawall and storage dome. "The site is very small and compact, and we're able to accommodate the small site," engineer for Dome Technology Mike Gibbs said.

The self-emptying ability for a large portion of the volume was one factor that led Albioma to select a dome, said Albioma project director Claude Décamp. The dome achieves 75% live reclaim with a tunnel underneath for loadout; remaining product is reclaimed via front-end loader. The pellets are conveyed to trucks, then delivered 20 miles across the island to the Albioma plant.

Another consideration was safety. A nitrogen system pacifies product and prevents fire that would threaten other facilities located on the busy port. Dome Technology supplied and installed the nitrogen-gas piping system below the concrete floor for the customer's own nitrogen system to be connected for pacifying the product when stored for longer periods. In accordance with European directives, the team designed and installed ATEX 22 explosion-relief

Product load out was made possible by building a conveyance system to fit the tight space between water and storage structure.

openings and an ATEX 22-rated lighting on the inside of the dome apex.

Construction began with soils remediation and deep-piled foundations. "We were on the port area and so close to the water, and so the weight of the dome and stored product was a concern there," Dome Technology lead foreman Eric King said. The soil was especially compromised as much of the 'ground' had been placed there years before and was filled with coral and dumped material.

The Dome Technology team excavated two metres of surface material and replaced it with crushed stone. Five hundred stone piles were then installed.

Establishing a solid foundation met the demands of local conditions, where cyclonic and seismic events are common and poor soil is the norm; in fact, two earthquakes took place during construction. "The structure can withstand 200-plus mph winds, and being the structure it is, the dome can withstand an earthquake as well," King said, adding that the island is home to an active volcano too.

The DomeSilo™ achieves 75% live reclaim with a tunnel underneath for load out.

Though flat storage was an option, the large size as well as anticyclonic and anti-seismic accommodations and soil remediation would have required a very high investment cost. The dome was selected for its smaller footprint, less-expensive foundation, lower overall cost and higher storage capacity, Décamp said.

Albioma is an independent energy producer and world leader in the conversion of biomass into a highly-effective source of energy, in collaboration with its agri-business partners. For more than 20 years, Albioma has operated power plants recovering bagasse, a fibrous by-product of sugar cane, replaced by coal outside the sugar cane harvest. Its unique expertise has enabled Albioma to establish itself as an indispensable partner in the sugar and ethanol industry in the French overseas territories and Mauritius.

Dome Technology builds storage domes for diverse products all over the world and customizes each to the location and customer specifications.

Powerful railcar vibrators from Martin Engineering deliver high force, low weight

Martin Engineering, a global provider of industrial vibration technology has introduced a portable vibrator that activates the free flow of bulk materials from closed-top hopper railcars. With one of the highest force-to-weight ratios available in the marketplace, the Martin® IMP3 Impacting Railcar Vibrator delivers the power required to evacuate compacted bulk materials such as fertilizers, bentonite clay, Portland cement, grain and other agricultural products. Extremely high quality standards for the design deliver superior equipment reliability and long service life, allowing the competitively priced units to improve workplace safety with very little maintenance and a low cost of ownership.

"When a railcar is being emptied, the process needs to be fast, efficient and thorough, because extra time spent unloading, manually cleaning or sending cars back with material in them can translate into lost profits or increased costs," explained Marty Yepsen, Business Development Manager for Railcar Products at Martin Engineering. "The higher the force to weight ratio, the more force is delivered to the material, increasing the efficiency of the vibrator."

The IMP3 was purpose-built for unloading dry powdered bulk materials. If vibrators fail, workers may need to resort to unsafe practices to get material flowing again, such as hammering on the cars or attempting to unclog them from the bottom of the hopper.

To avoid these expensive and potentially hazardous scenarios, the IMP3 produces 3,000 vibrations per minute (VPM) and 3,400 lbs. (1,542kg) of force, which has been compared to a sledgehammer blow 50 times per second.

Set on the hopper slope of the railcar, the unit dislodges adhered and compacted material.

The rapid impacts generate a vibratory wave through the metal hopper of the railcar, loosening adhered material to promote fast and even flow.

The weight factor

Lifting heavy items is one of the leading causes of injury in the workplace. In 2001, the Bureau of Labor Statistics in the US reported that over 36% of injuries involving missed workdays were the result of shoulder and back injuries. Over-exertion and cumulative trauma were the biggest factors in these injuries[1].

The IMP3 replaces a traditional cast iron housing with an aluminium body coupled with a wedge bracket, and it features an integrated handle for easy gripping and moving. The low weight means that more of the energy is transferred from the unit to the hopper.

"Weight and ease of use are important, because transferring the vibrator can be a repetitive motion that produces fatigue and eventual injury," Yepsen said. "This lightweight unit is designed specifically for constant handling in less-than-ideal environments."

The IMP3 requires an air supply of 80psi and 25ft^3 per minute (0.012MPS). When operated using a filtered, regulated and lubricated air supply, the unit requires virtually no maintenance.

Made in the USA and competitively priced to replace heavier and less reliable competing designs that can be difficult to handle, the IMP3 has already built a faithful following among its users. "Visiting the facilities that have started using these units, operators tell me they're impressed by the ease of use and the low maintenance," Yepsen concluded. "This is one of those products that has a profound impact on logistical efficiency, workplace safety and overall cost of operation."

Martin Engineering, based in Neponset, IL, develops and manufactures flow aids and conveyor products around the world for a wide variety of bulk material applications, including coal, cement/clinker, rock/aggregate, biomass, grain, pharmaceuticals, food and other materials. The firm provides a complete line-up of products specifically designed for railcar applications, including vibration technology for loading/unloading, boot lifts and car openers. Manufacturing, sales and service are available from factory-owned business units in Brazil, China, France, Germany, India, Indonesia, Italy, Mexico, Peru, Russia, Spain, South Africa, Turkey and the UK, and under exclusive licence with ESS Australia.

1) https://www.osha.gov/SLTC/etools/electricalcontractors/materials/heavy.html

The IMP3 is designed to withstand the most punishing conditions.

The unit is designed to be lightweight with an easy grip handle, reducing the strain of mounting/dismounting.

ABHS increases dealer coverage in North America and Canada

Astec railcar, which loads railcars directly from trucks.

Astec Bulk Handling Solutions (ABHS), a subsidiary of the American Astec Industries, continues to gather momentum in the North American and Canadian markets with the appointment of four new and experienced dealers. The calibre of the dealer appointments reflects the significant investment from the manufacturer in its North American and Canadian operations and its continued commitment to keep the customer at the forefront of the business.

The company offers the ship, barge and rail loading/unloading industry highly innovative and customized mobile bulk handling systems. It has extensive experience in the handling of dry bulk products from around the world and its wide range of products includes mobile and static truck unloaders, ship, barge and rail loaders and unloaders, radial telescopic barge loaders, hopper feeders and stacking conveyors that can handle all dry bulk materials, including grain, fertilizer, biomass, aggregates, ores and coal products — all custom-designed to suit each individual customer's requirements.

Conor Brogan, Technical Sales Manager for Astec Bulk Handling Solutions, explains "our recent dealer appointments have been significant in consolidating our position as the leading bulk material handling specialist in North America and Canada. Our new dealers have considerable experience in all aspects of handling dry bulk material and it is imperative that our representative selection reflects our brand and they are equally committed to a high level of industry knowledge and customer support."

Dealer Appointment to Enhance the ABHS Experience

The recently appointed ABHS dealers have been hand-selected to support the customer in every way. The new appointments are:

- Quebec and Atlantic Provinces, Canada – Manuquip;
- States of Illinois & Indiana – Howell Tractor;
- State of Michigan – Alta Equipment;
- States of Minnesota, Iowa, including UP Michigan and Wisconsin Lake Superior and Mississippi shores — RMS Equipment; and
- States of Arkansas, Oklahoma, Missouri and Kansas – Van Keppel.

Brogan continues "Our growth has been significant as our products continue to delight customers. We have several innovative projects already commissioned in North America, including two dedicated rail car loaders which load rail cars directly from trucks, a 170ft 2,000tph (tonnes per hour) stacker receiving material from a primary jaw crusher and a number of custom designed tracked machines built to move large pieces of equipment around sites significantly easier than traditional methods. All of these projects are solutions that will solve very specific issues for our customers, and we believe they can be rolled out across the industry to revolutionize mobile bulk material handling where old-fashioned, inefficient methods still reign. It's going to be an exciting year."

Cost benefits vs traditional methods

ABHS products provide cost-effective alternatives to traditional mobile harbour cranes, front loaders and mobile material handlers. Flexibility is paramount with the product range designed to be used along the various stages of logistics chain: the same equipment can load and unload vessels as well as stack and reclaim. Another key feature is the true mobility of the equipment, enabling it to be easily moved around the terminal. Additionally with the ABHS equipment not requiring any civil infrastructure or permanent fixings to the dock, the machines can be moved from port to port to work on different projects with ease — all key benefits of purchasing an ABHS piece of equipment.

Innovative custom engineering

Astec Bulk Handling Solutions works closely with customers from the earliest stages of the sales process to ensure that the client's needs are met. The technical sales team attend and assess the site to ensure that the client receives a solution that fully integrates into its infrastructure and works with the client to ensure the equipment complies with all applicable local laws and standards. Central to the business is providing the customer with the optimum solution in terms of flexibility, efficiency and production and supported by a local, reliable and knowledgeable dealer network.

Calim Grabs: used throughout the bulk industry – including railcars and barges

Handling gypsum on a barge using a radio remote-controlled clamshell grab from Calim.

Calim Grabs (Calim Kepce) is a global manufacturer of grabs and other lifting equipment. Its grabs are used widely in the bulk handling industry, and, among other applications, are suitable for loading/unloading railcars and barges (see picture, top right).

The company's range includes lifting equipment for bulk cargo, as well as special hoists.

Key areas where Calim Grabs' models are very popular are: ports; ships; manufacturers of cranes and construction machinery; steel mills; waste-to-energy plants; and recycling/scrap handling industries. Calim's factories and headquarters are located in Istanbul in Turkey. It is in these premises that Calim manufactures products for all cargo handling applications — all of its models are based on the proven Calim product design.

Calim's main customers are: crane manufacturers; stevedoring companies; dredging companies; shipping companies; fertilizer companies; cement companies; mining companies; alumina producers; steel manufacturers; and electrical power plants. Calim Grabs has gained great expertise in handling all types of cargo, including: fertilizer; coal; gypsum; grain; soyabeans; sand; scrap steel; rock; clinger; cement; iron; ore; salt; petcoke; wood; chipboard and many more.

In 2010 Calim Grabs added remote-control clamshell buckets for bulk handling to its portfolio. The remote-control grabs are used in ports and terminals worldwide.

Calim Grabs is known worldwide, and is known for quality, sophisticated technology and quick response.

The company's grabs can be found everywhere where materials are handled, and has a particularly strong reputation for the loading and unloading of bulk vessels.

The success story of the Calim Grabs began in 1970, with the building of the first grab – a mechanical 800-litre single-rope dredging grab. Today, Calim Grabs offers a complete product range: mechanical four-rope grabs, electro-hydraulic

motor grabs, radio-controlled single-rope grabs, hydraulic grabs, as well as a wide range of special lifting accessories.

Today, new designs and alternative materials are continuously brought into serial production. An example of a recent development is a radio-controlled single-rope clamshell grab with a capacity of 30m³ used for the operation with container cranes

Calim Grabs are being constantly optimized to meet the growing challenges of today's bulk market. In particular, with regard to the specific demands in ports and on board ships, Calim's motor and rope grabs enable cost-effective loading and unloading of a broad range of cargo. Calim Grabs are suitable for the use in rough bulk handling environments and can be operated in all climates. All components are resistant to seawater.

Calim Grabs strives to keep the environmental impact associated with the use of grabs as low as possible. A number of features makes it possible to minimize the loss of bulk materials. In addition to dust covers, these include special sealing systems on the side and bottom lips. The use of steel sealing strips, rubber-sealed lips, overlapping bottom and side lips or special side toothing prevents bulk materials from trickling down.

The use of water-based paints and the option of a central lubrication system — both of which have been available for many years — also provide a further contribution to environmental protection. Optimizing the choice of electrical and hydraulic components makes it possible to use smaller motors than those in models from some other suppliers.

Calim Grabs' products are high quality, and the company is proud of its facilities that adapt easily and quickly to technological developments as they take place.

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TMSA are specialists in the design and manufacturing of ship loaders for a vast variety of bulk materials, ranging from agricultural to mineral commodities. Our In-House Design Engineers are Experts in Loading Solutions, and will meet every customer unique equipment requirements.

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Grain 1,500 tph

Grain 2,000 tph

Sugar 3,000 tph

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Newly formed Sackett-Waconia's product range includes railcar loaders/unloaders

The A.J. Sackett & Sons Company and Waconia Manufacturing, Inc. have recently merged and become Sackett-Waconia. The newly formed company brings together over 180 years of combined experience, four manufacturing locations in the US, joint ventures in Brazil and Africa, and a highly effective sales force with significant global reach. Taking advantage of opportunities in the market and greater emphasis on precision agriculture, it is the right time to move forward, offering greater engineering capabilities and expanded product lines, while capitalizing on customer focus, experience, and reputation for excellence.

Sackett-Waconia specializes in complete system design for bulk fertilizer terminals, blending, granulation (NPK, SSP, AMS), compaction/granulation, super phosphate and coating (powder, controlled release). To meet today's nutrient needs, and assist greater nutrient use efficiency, Sackett-Waconia engineers systems designed to maximize accuracy. The company believes that good nutrient stewardship is supported by every part of the supply chain.

Sackett-Waconia has recently completed numerous projects across the entire spectrum of the fertilizer industry, including engineering and equipment for Potash Corp's 89-acre Hammond Indiana distribution centre.

Rail loading station, which can load outbound rail cars at speeds higher than 750tph.

Truck loading.

In early 2010, Sackett-Waconia was approached by Potash Corp (PCS) with an engineering request for what would become the largest inland rail terminal for fertilizer storage and distribution in the United States. The goal was to move potash from its mines in Saskatchewan south of Chicago, where it is closer to the market, for easier distribution to





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Interior of the warehouse.

its customers in the heartland of the US.

Before the new terminal, the material coming into the Midwest United Sates from Canada had to pass through Chicago, one of the most congested rail lines in the country and PCS was looking for an opportunity to get around that choke point. It chose a site in Hammond, IN to avoid the Chicago area, and began working toward a site that would be like having a small mine near its customers. The Hammond facility would include a 120,000-tonne warehouse facility and 14 miles of new track, built to accommodate over 1,000 railcars. Cars would bring material south from the recently expanded mines in Saskatchewan, and material would be stockpiled until it is ready to be shipped. PCS's design intent was to unload and reload cars as quickly and efficiently as possible, while ensuring material wasn't degraded in the process.

Sackett-Waconia was tasked with designing a system that could unload inbound railcars at 1,200tph (tonnes per hour), and load outbound trucks and railcars at 750tph+. Engineering for the task began in February of 2010, and the result was a system that would receive from rail, interface with a Metso portal stacker rake, and then transport material to a loadout tower when the stacker rake is run in reverse.

The portal stacker rake has an integral belt tripper that takes inbound material from a high capacity belt and stacks it via its own internal belt. When reclaiming, a series of rakes pull material to the stackers outbound feed skirt and deposits it onto another high capacity belt, which feeds the dual garner style loadout tower.

The loadout tower consists of an 800tph+ bucket elevator, which transfers materials from the reclaim belts to the 100-tonne holding hopper. The holding hopper feeds a dual garner system that can provides an average of 750tph to the railcars. The weigh and surge hoppers of the garner system ensure that while weighed material is being loaded, another batch is being weighed, greatly increasing loadout speeds. The lower surge feeds either of the two truck lanes or either of the two rail lanes. Each rail lane is fed by a shuttle conveyor, to avoid spotting each car more than once and achieves a more consistent fill. Both the receiving and loadout systems were designed to be simple, easy to use, and built with heavy duty materials to ensure a long life. The automation features simple easy to use interfaces, and the tower control room is situated to provide a direct view of the loading points, for added safety.

Overall, Sackett-Waconia was able to provide PCS a system that was a two- to three-fold speed increase over existing systems. By the site's 2016 commissioning, PCS would be positioned to provide high quality potash, in the shortest amount of time to its customers. While completing an engineering challenge of this type was a reward in itself, Sackett-Waconia was proud to work with PCS, and happy that it could provide them with a system that met all expectations — and helped it achieve a long-standing goal for increased service to its customers. DCi

Moving ore concentrates dust-free

The feeding belt conveyor transports the ore concentrate to the BEUMER Group Pipe Conveyor. A magnetic separator ensures that metal parts are rejected, and a metal detector provides additional safety to prevent damages. (All photos: BEUMER Group GmbH & Co. KG)

BEUMER Pipe Conveyor ensures dust-free transportation of ore concentrates

No pollution caused to the environment

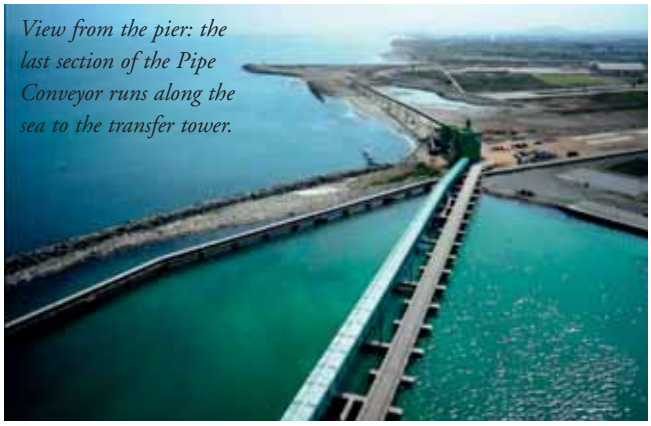
Transportadora Callao S.A., the logistics operator of a special cargo terminal in the port of Callao/Peru, relies on a BEUMER Group Pipe Conveyor for the transportation of zinc, copper and lead concentrates, from different mining companies, from the warehouse to the terminal. With its ability to navigate curves in three dimensions, the conveyor can be optimally adapted to its routing course of approximately 3,000 metres. Even more importantly: the conveying system prevents the concentrates from coming into contact with the environment and ensures dust-free transport to the ship's holds. BEUMER Group was responsible for engineering and supply, including the steel structure, supervision of the installation and putting the Pipe Conveyor into operation.

Callao is located directly on the Pacific Ocean. With 877,000 inhabitants, it is one of the largest cities of Peru, with the largest airport in the country and one of the most important fishing and commercial ports in South America. A modern shiploading terminal for ore concentrates was built in this port and it is operated by Transportadora Callao S.A.

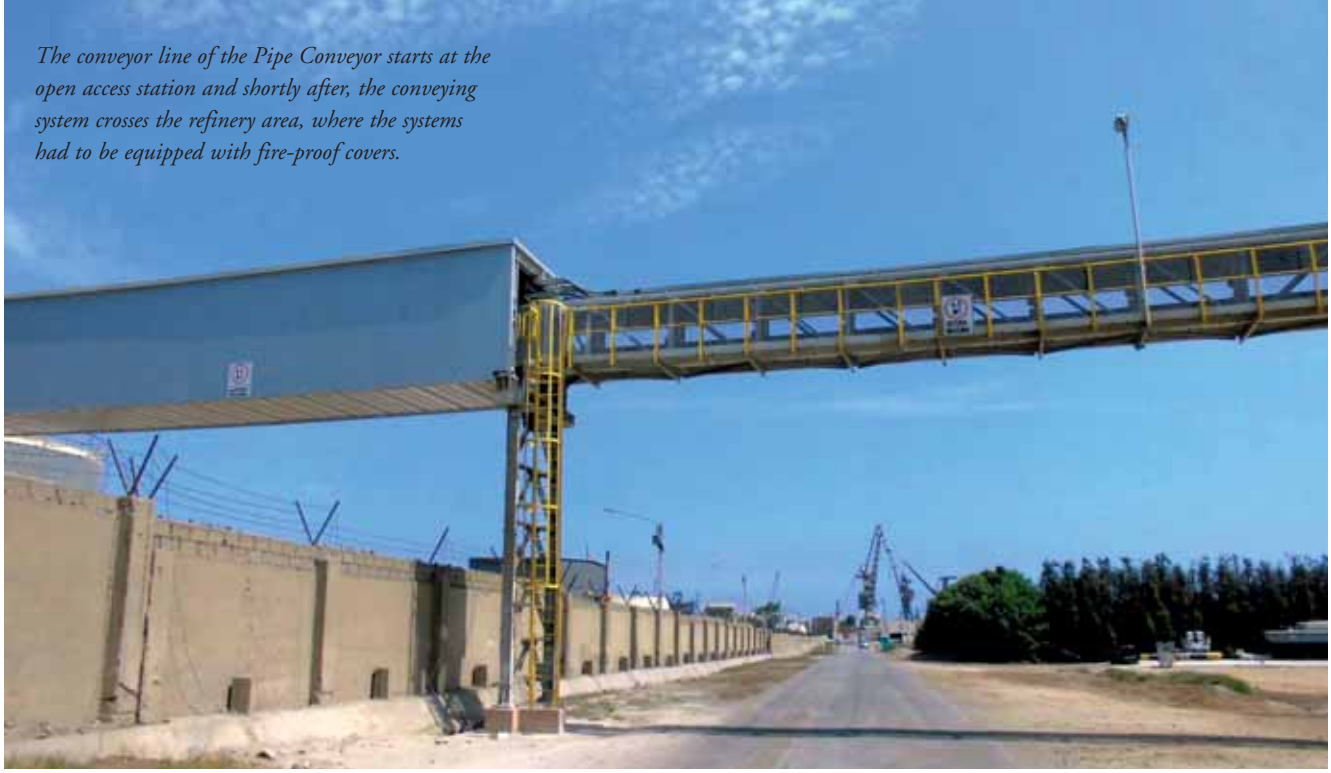
About 75% of the imports and exports of Peru, one of the most important mining countries world-wide, are handled in Callao. In order to satisfy the increasing demand for these valuable materials, the Peruvian government decided to expand the port. Besides additional storehouses, the plans also foresaw the largest, most modern shiploading terminal in the country. Peru also wanted to change the way the raw materials were transported to the shiploading areas. Before the construction of the special terminal, trucks were used to transport the concentrates from the warehouses to the port terminal. "Since Transportadora Callao started its operation, they could reduce the truck drives by 130,000 per year," explains Victor Sam, CEO at Transportadora Callao S.A. The company, a consortium comprising five enterprises from the mining and port industries (manufacturers and warehouse logistics operators), obtained a licence from the state of Peru for building and operating the necessary infrastructure.

Pipe Conveyor: dust-free conveying

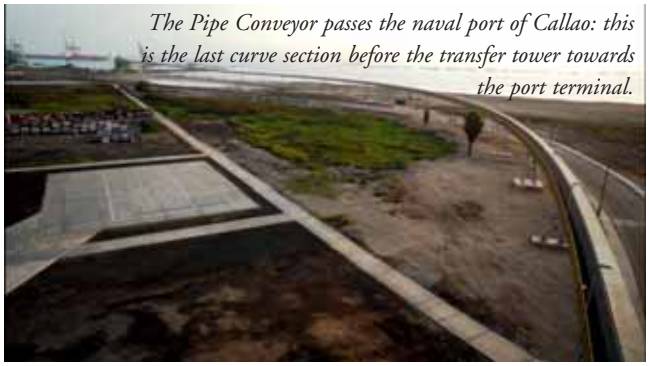
The mines in central Peru transport their concentrates to the



View from the pier: the last section of the Pipe Conveyor runs along the sea to the transfer tower.



The conveyor line of the Pipe Conveyor starts at the open access station and shortly after, the conveying system crosses the refinery area, where the systems had to be equipped with fire-proof covers.



The Pipe Conveyor passes the naval port of Callao: this is the last curve section before the transfer tower towards the port terminal.

warehouses, approximately 3km from the port. This required an absolutely protected method for the transportation of material, to prevent particle emission into the atmosphere. Transportadora Callao opted for the BEUMER Group Pipe Conveyor. The direct contact person and project partner was Helmut Wolf from BEUMER Group Austria GmbH: "Together with the responsible persons from the customer, we developed a solution that is perfectly adapted to the routing and the ambient conditions."

Due to its enclosed transport, the Pipe Conveyor not only protects the environment against harmful impacts during the transport of the lead concentrate, it also allows conveying over long distances and navigation through tight curve radii. Due to its ability to navigate curves, this belt conveyor requires far fewer or no transfer towers at all, depending on its length and the available curve radii. This results in substantial cost savings for the customer, and allows BEUMER Group to easily customize the system to the individual routing. Durable conveyor belts guaranteeing tensile strength are used. The engineers use different dimensioning programmes to determine the ideal belt design. They use them to calculate tractive forces and forces that arise during acceleration and deceleration and also to determine possible curve radii. The BEUMER Group provides tailor-made feasibility studies for each project. Another advantage is the reduced noise emission that the system provides. This is ensured by special idlers, as well as low-noise bearings and selecting the right conveying speed. "This improves the quality of the employees' day-to-day work environment," says BEUMER engineer Wolf. Sam adds that the "noise measurements along the Pipe Conveyor resulted in values that are consistently far below the permitted limit values."

Conveying capacity: 2,300 tonnes per hour

BEUMER Group supplied and installed a Pipe Conveyor with a centre distance of 3,195 metres. "Due to the system design and the required system capacity, we designed it with a diameter of 400mm," explains Wolf. "The conveyor transports 2,300tph (tonnes per hour), at a speed of 4.5m/s and is driven by three motors with a capacity of 650kW each. We equipped the system with filters, strippers, a dedusting unit and a control system." BEUMER Group was responsible for engineering and automation, and supplied the steel structure and the necessary components. The site managers supervised the installation and put the system into operation.

The process is practically free of faults and, above all, safe: trucks or trains transport the mining commodities from the mines to the ore storages, from where they are transported to the open access station. Here, the concentrates are received by a feeding 43m belt conveyor that transfers it to the Pipe Conveyor at a height of six metres. A dedusting unit ensures that no material is emitted during this process. "We equipped the feeding belt conveyor with a metal detector and an electric magnet," explains Wolf. "This prevents damage of the downstream Pipe Conveyor by metal parts." At the end of the route, the conveying system runs along the seaside in the naval port of Callao to the transfer tower. Here, the belt opens automatically. It transfers the material to another belt conveyor that conveys the ore to the ship loading system.

Says Sam: "This modern system, in operation now for 17 months, caused a significant increase in speed by 500% for loading concentrates and reduced the ship's waiting time until loading by more than 80%. These advantages lead to savings for the exporters and improve the competitiveness of the country's mining industry."

Trouble-free integration, challenges mastered

"A big challenge for us was integrating the Pipe Conveyor into the existing environment," says Wolf. The BEUMER system is the connection between the individual belt conveyors from various manufacturers. "When managing the project we had to meet

The product is conveyed completely free of dust at a height of six metres.

several official requirements," reports Wolf. The project represents a concession by the state of Peru given to Transportadora Callao S.A., which commissioned Odebrecht Perú Ingeniería y Construcción to carry out the execution, and Buenaventura Ingenieros S.A. the supervision. Odebrecht commissioned BEUMER Group with the design of the entire line section onshore. The onshore section starts at the 'open access', where the concentrate is transferred from the warehouses. The Pipe Conveyor then passes a refinery and a military area. "That was the specified routing that we had to observe," explains Wolf. In the area of the refinery, the systems had to additionally be equipped with fire-proof covers.

Due to this impressive engineering work, Transportadora Callao is now able to handle ships for bulk products of up to 60,000dwt without obstructing the work in the other terminals of the Callao port.

World-wide connected and brought to one point

BEUMER Group has bundled its comprehensive expertise spanning various industries and established different centres of competence in order to offer optimal support of their single-source solutions for companies like Odebrecht and Transportadora Callao. The Pipe Conveyor segment is one such centre of competence. This centre is responsible for sales and project management worldwide. It collects and prepares the know-how of each regional group company and passes it on to the group company's global experts, such as Wolf and his team. "BEUMER's technical team has proven its professionalism and stand-by duty, during construction and operation, and after 1.5 years in operation and more than four million tonnes of transported concentrates, we can attest that the set goals have been reached," explains Sam.

BEUMER Group's extensive customer support ensures a high level of system availability after commissioning. Transportadora Callao just signed a teleservice contract with BEUMER Group, so that BEUMER specialists can eliminate possible malfunctions in the system. If necessary, the BEUMER Group service staff will go to Callao in order to make the necessary adjustments and prevent malfunctions and machine breakdowns, which would lead to long downtimes.

About BEUMER

The BEUMER Group is a major international manufacturer of intralogistics systems for conveying, loading, palletizing, packaging, sortation, and distribution. With 4,000 employees worldwide, the BEUMER Group has annual sales of about €750 million. The BEUMER Group and its subsidiaries and sales agencies provide their customers with high-quality system solutions and an extensive customer support network around the globe and across a wide range of industries, including bulk materials and piece goods, food/non-food, construction, mail order, post, and airport baggage handling.

The Pipe Conveyor ends at the transfer tower, where the material is transferred to the ship loading system.

Cimbria completes major silo order in Egypt

Twenty-three large silo plants supplied by Cimbria to Egypt were commissioned and officially inaugurated by the President of Egypt, H.E Abdel Fattah el-Sisi, during a mammoth event in El-Marashda, near Luxor, on 14 May 2017, *writes Henning Roslev Bukh of Cimbria Unigrain A/S.*

This project is believed to be the largest order for silo plants ever made, comprising a total storage capacity of no less than 1.38 million tonnes of wheat, and with a contract value for Cimbria of more than US$100 million.

Around 400 VIPs were gathered in an air-conditioned tent at the silo site where Egyptian President H.E. Abdel Fattah el-Sisi, the Egyptian Prime Minister and three other ministers were present during the six-hour event. The President headed the official opening of the silo, in addition to appearing via a video link in order to open three other silo installations and new infrastructure projects.

The President visited the control room and inspected the plant in operation as it received and discharged grain. Cimbria garnered huge praise in connection with the role it has played in the successful completion of the mega project on time.

With *per capita* consumption of around 250kg/year, Egypt is a major grain consumer, as well as being the world's biggest importer of wheat, with an annual import of 17mt (million tonnes) of different grain products. Furthermore, local production takes place on 4% of Egypt's rural land, primarily in the Nile Delta and in areas on the banks of the Nile all the way down to the Sudanese border. This results in a total production of 23mt of a range of different grain products.

The locations of the 23 plants stretch from the Mediterranean Sea and Sinai all the way down to Aswan, in addition to a plant that has been constructed in the Sahara desert 600km west of Aswan, where an oasis provides water for wheat production.

The Government of Egypt selected the 23 sites, with priority being given to grain-producing and grain-consuming areas throughout the country where silos did not previously exist, in addition to extensive, newly reclaimed and cultivated desert areas where water has been made available for irrigation and new cities are being built — in the Sinai desert, for example.

In the past, the majority of locally produced grain was stored in open outdoor sack storage or bag storage facilities, with losses of up to 30% as a consequence. Moreover, handling this grain in bags has proved costly, as a result of which the Egyptian government decided to switch to modern bulk handling and fully enclosed storage silos in order to improve food security and minimize post-harvest losses.

One of the main criteria for awarding this huge contract to Cimbria was the company's numerous reference plants in the

Middle East and its ability to undertake the entire mechanical/ electrical project on a turnkey basis, including architectural/ mechanical and electrical design and engineering, in addition to the design and calculation of steel structures, silos and loads for all foundations and structures for each of the 23 plants.

Time was also a critical factor in the decision to award the contract to Cimbria, with its huge modern production facilities enabling Cimbria to deliver no fewer than 1,400 containers with around 25,000 tonnes of steel and equipment within a period of just nine months, followed by approximately one year for installation. The project has been closely managed by Cimbria project management teams in both Denmark and Egypt.

Cimbria supplied all conveying equipment, cleaners, laboratory equipment, silos, electronic control units featuring SCADA/PLC, spare parts for three years of operation and delivery to Egypt. The project also included the supervision of the installation of equipment and electrical systems at all 23 facilities simultaneously. During the installation phase, Cimbria had up to 46 supervisors and managers working in Egypt.

Following installation, Cimbria conducted a training

programme in which 20 Egyptian employees at each plant received instruction in operation and maintenance. Final capacity testing was performed prior to handing over the many new plants. Each of the 23 plants has a silo capacity of 60,000 tonnes, including conveying and cleaning facilities with a capacity of 200 tonnes per hour. Total silo capacity will thus amount to 1.38mt. All of the 23 silo plants have received grain from the current wheat harvest that began in April.

Cimbria's turnkey project solutions are recognized worldwide for their ability to ensure the highest possible utilization of essential grain crops whilst keeping losses to a minimum. These projects are undertaken by a project department in Denmark with a staff of 150 people.

Twelve of the 23 plants are for the government-owned Ministry of Supply and Home Trade. These plants will be used for locally produced grain and as buffer and intermediate storage facilities for imported wheat. The remaining facilities are for the Egyptian Ministry of Agriculture and Land Reclamation and are installed at remote locations throughout the country, thus enabling farmers to deliver and sell locally produced grain.

Cimbria has delivered an almost uninterrupted sequence of grain facilities to Egypt during the last 25 years, and now has more than 60 operational reference plants boasting a total storage capacity of some 2.5mt. Since 2012, Cimbria has had its own sales office in Egypt offering full after-sales service. DCi

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Engineering consultants

(photo: Emile Beurskens, Vitelia Voeders)

Tebodin develops sustainable feed production facility in Wanssum

Vitelia's new storage and handling facility, which was inaugurated in January this year, represents a critical milestone when it comes to the material shipment approach of the future.

The idea of the Dutch feed manufacturer Vitelia Voeders, a company of the agricultural co-operative Vitelia, meets the current spirit of the age. In a time when global warming and

rapid climate change remain pertinent issues to be taken into account during daily business operations, innovative production processes and zero-emission transport distinguish the manufacturer of the future.

"Transport by water remains a favourite when it comes to low-emission means of transport. With that in mind, the idea of a raw material storage and processing plant at the port of Wanssum evolved," explains Arie Janssen, the facility manager of Vitelia. Furthermore, the idea of building a new facility directly at the water was expected to result in several benefits for the feed manufacturer, such as facilitating and ensuring the raw material supply of two other production plants, Ysselsteyn and Oirlo, located in the near vicinity. The planned additional storage capacity would not only make it possible to benefit from low-price periods on the commodity market, but also enable the company to achieve a significant reduction in CO_2 emissions. The fact that all raw materials are transported by ship would, in turn, result in a saving of four million kilometres of transport by truck.

(photo: Emile Beurskens, Vitelia Voeders)

However, many outstanding innovative ideas fail in the implementation phase. That is why Vitelia went looking for partners and experts with the same outside-of-the-box mindset in order to make this idea a reality. One of those partners it found was Dutch engineering and consultancy company Tebodin. "The primary reason why we chose Tebodin as our engineering partner for this particular project was the company's expertise in feed and agro terminals," Stefan Kuijpers, managing director of Vitelia remembers. Besides designing a large commodity storage and handling plant, Tebodin has also been responsible for preparing the tender documents for suppliers, requesting the environmental permit, including the associated environmental analysis, and filing the construction request as well as communicating with the competent authorities.

"The first step in our approach for this project was to clarify the fundamental requirements of the client, such as the required storage and handling capacities, the expected delivery volumes and the location. Deliberately taking your time to identify the client's priorities and the project parameters right from the start is the key ingredient for project success. Through applying this approach, we have been able to involve all project stakeholders at an early stage, which has resulted in numerous benefits during the course of the project," says Oswin Verkerk, head of the Tebodin Feed & Agro expertise centre in Deventer, the Netherlands.

The international consulting and engineering firm Tebodin supports clients in the bulk handling business during all stages of a project. Thanks to the extensive experience that the company has gained over many years of operation, and the considerable network it has built, Tebodin serves clients all over the world with its specific expertise.

In early project stages Tebodin delivers a conceptual design with a first investment estimate. This enables the client to make cost- and time-efficient investment decisions. In the next phase, Tebodin prepares the required engineering documents and, if necessary, makes sure that all permits are taken care of. The processes on the construction side are managed to ensure that the project is executed in a safe and sound way without any surprises with regards to budget and planning.

Another special feature of this particular project was the unique shape of the storage silos. "Our engineers designed a hexagonal high-rise concrete silo, with a total height of 60 metres, comprising all associated facilities and installations. The design consisted of 21 large silos for the storage of raw materials and 12 smaller silos that now enable our client to store other products and thereby enhance flexibility. Furthermore, the forward-looking design offers several possibilities for future expansions of the current storage and handling capacity and a modification into a fully-equipped new feed production facility including a direct connection with the existing fully automated storage silos and terminals."

The result of the excellent collaboration between Dutch feed manufacturer Vitelia Voeders, consulting & engineering company Tebodin and the project stakeholders involved is impressive. A large new concrete silo complex was built in 1.5 years. The raw material silos with a storage capacity of approximately 20,000 tonnes has a ship intake capacity of 350 tonnes per hour and is able to load three trucks simultaneously within six minutes. Moreover, the storage facility is fully automated. This means that the silos can be controlled from the production location a few kilometres away. No operator has to be present during the unloading of the ships or loading of the trucks, which results in reduced operating costs.

"Ultimately, everything seems to work as it was planned on paper," summarizes Verkerk. "We have managed to make our client's idea of a storage and handling facility at the water work."

About Tebodin

Tebodin is a multidisciplinary consulting and engineering firm with offices in 17 countries. It serves clients all over the world by offering the combined knowledge and experience of 3,200 dedicated professionals. It delivers world-class consultancy and engineering services to local and international clients in a wide range of industrial markets, including chemicals, health and nutrition, oil and gas, and energy and environment.

The Tebodin network of 35 offices offers global expertise in fully integrated engineering and consultancy services and the local know-how that keeps investment projects within the agreed time and budget limits. Tebodin is part of the international engineering and services company Bilfinger SE.

ASGCO®'s Point Cloud Scanning technology offers pinpoint accuracy

US-headquartered ASGCO® is a major manufacturer of proprietary bulk conveyor components and accessories that enhance material flow performance. It is a diversified and innovative company with six major divisions that serve specific targets of the material handling industry. Every material-handling system has conditions — either large or small, constant or intermittent, open or obscure — that an ASGCO® study can identify and improve. ASGCO® believes that proper engineering consultancy can provide operational improvements that are a wise investment.

ASGCO® utilizes a new technology that can assist greatly at the consultancy stage. It's Point Cloud Laser Scanner has already been put to use to great success — two case studies are detailed below.

The ASGCO® Point Cloud Laser Scanner is a powerful high-speed Focus3D X 130 HDR 3D scanner, delivering realistic and true-to-detail scan results. The laser technology is more accurate than traditional methods because it looks at thousands of points along the clearance plane, not just a few sample points. The ultra-portable Point Cloud Laser Scanner enables fast, straightforward, and yet accurate measurements of facades, complex structures, production and supply facilities, accident sites, and large-volume components.

ASGCO® Point Cloud Laser Scanner delivers extraordinary colour overlays for scanned point clouds. This improves the visualization of important details on site. The system can capture over one million points per second and can scan through 360° horizontally and vertically. Once a chute and conveyor are modelled, the model is overlaid into the cloud point scan to ensure there are no interferences and that all modelled equipment fits properly.

Benefits and features

- distance accuracy up to ±2mm;
- range from 0.6m up to 130m;
- noise reduction 50%;
- safe and fast as-built data capturing with superior colour detail;
- reliable life-like visualization, even under extreme lighting conditions;
- reduced complexity by integrated scanning and imaging workflow for all kinds of measurements even in challenging environments; and
- allows models to be overlaid onto cloud point scan to double check accuracy.

Case studies

Point Cloud Scanning technology integrated into ASGCO® conveyor safety product installation at Mid-West coal-fired power plant

Industry: coal-fired power plant

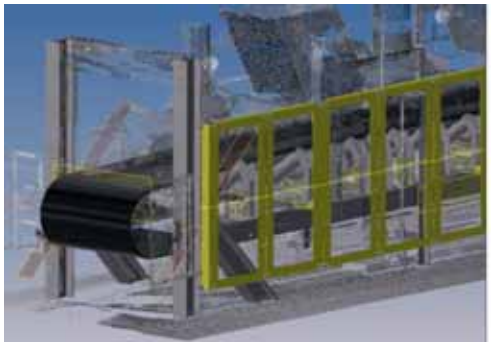
Application: three coal handling conveyors

Product: ASGCO® Point Cloud Scanning Services, ASGCO® Safe-Guard Return Roller Guards, Return Roller Cages, and Flat Guard Panels.

Objective: Provide plant workers safety in the workplace by the means of installing conveyor safeguard equipment. Although the plant does not fall under either MSHA or OSHA requirements, it strives for 'best practice' that meets both regulations and ensures plant safety.

Challenge

Due to fire prevention in coal handling facilities, the plant




required a turn-key installation that did not require a 'burn permit', thus all safe guarding panels, railing, and hardware had to be bolted onto existing conveyor structures or utilize existing bolt hole patterns. The project required a very strict design measurement tolerance, that provided precise, accurate co-ordinates. The need for accuracy was extremely important in prefabrication of the guarding's fastening system, in order to be able to work around existing the conveyor structures (i.e. existing holes, detouring around piping conduit and emergency stops). The plant had very limited down time and called for quick and efficient installation turnaround time.

Recommendations

ASGCO®'s services provided an onsite Point Cloud Scanning survey (two people @ 8 hours) for all three conveyors that required safe-guarding equipment. The ASGCO® Point Cloud scanning survey provided 'as-built' 3D image that enabled ASGCO® engineering to design and fabricate 'bolt-up' safe-guard railings with precise accuracy, so that no onsite welding or cutting would be required. ASGCO®'s Safe-Guard® Modular Conveyor Flat Guard panels with 'drop pin and wedge' design, would benefit in quick conveyor component access for plant personnel in preventive maintenance (PM) and future conveyor component installation works (while preventing workers from unauthorized access and away from moving parts and equipment).

Results

ASGCO®'s installation crew of four people was able to install 690' of guarding in three days (12 hour shifts each day). No welding, cutting or grinding was required, due to the accuracy attained from the infield ASGCO® Point Cloud scanning 3D imagery. All components bolted-up without a hitch. The plant is now eager to proceed on four more conveyors that need safe-guarding.

ASGCO® engineering helps East Coast silica manufacturer streamline its processes

Industry: minerals
Application: conveyor feeding dryers
Product: Flo-Control™ Transfer Point System
Objective: Bypass the dryer by redirecting product from an incline conveyor onto an adjacent steep incline conveyor.

Challenge

The customer first came to ASGCO® with the question "how can we eliminate our dryer and the conveyor that feeds it cost effectively?" The largest challenge of this project was the relationship of these two conveyors. They were not exactly perpendicular to each other which made the design of the chute difficult.

Recommendations

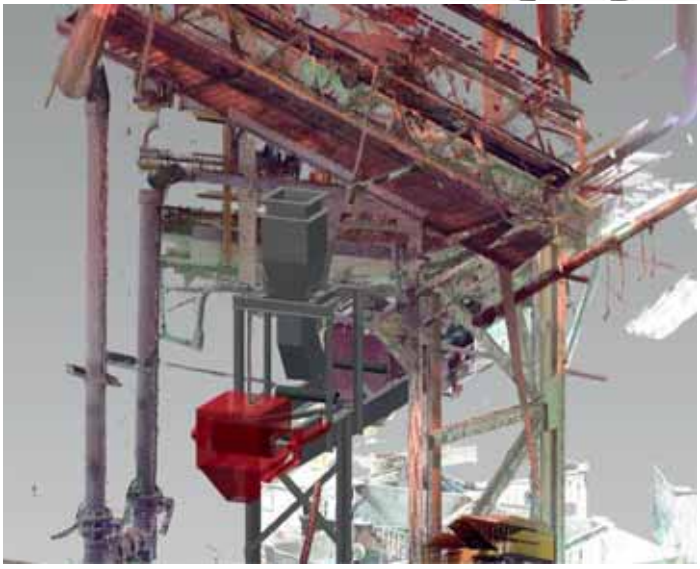
ASGCO® answered with a proposal that recommended a comprehensive Cloud Point Laser Scan of the area, a model of a bypass chute, a 3-DEM® flow analysis, and a full fabrication and installation proposal.

Solution

ASGCO® used a Cloud Point Laser Scanner to scan the area instead of taking field dimensions with hand tools, minimizing the margin for error and increasing accuracy. The ASGCO engineers were able to design the new chute and effectively place it with no interferences with existing obstacles. A 3-DEM simulation was then run to ensure proper material flow through the chute, while ensuring there would be no heavy impact or abrasion areas in the new chute. A FloControl™ chute was fabricated at ASGCO®'s fabrication facility and then installed to transfer the material onto a cleated belt, eliminating the dryer completely. UHMW lining was placed inside of the chute to give the chute better sliding capabilities and to prevent material from sticking to the chute and causing plugging.

Results

The result of this project are a fully functioning transition including an ASGCO®-engineered and -fabricated flow control chute and load zone that exceeded the customer's expectations in regards to quality, workmanship, and functionality. The customer was able to run product without any delays and it made for a seamless transition to the customer's goal of bypassing a dryer with its product. DCi



Installing a cement inlet probe system

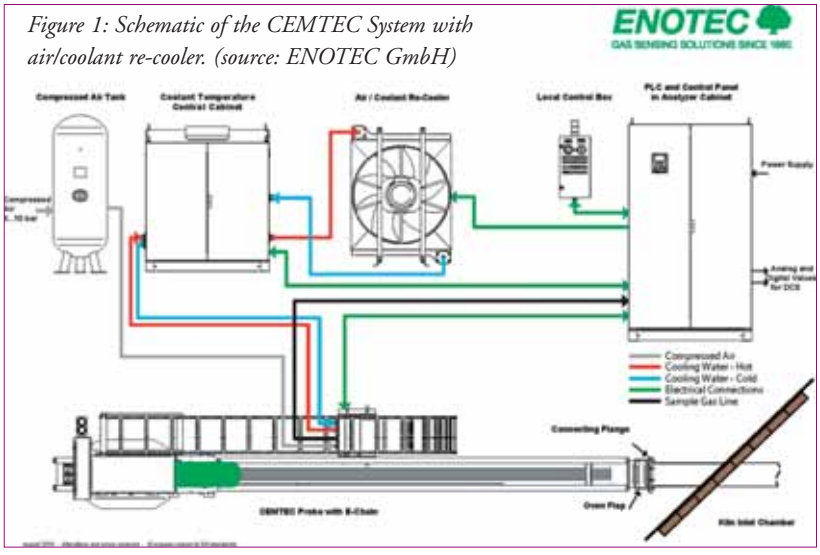
Figure 2: Installation of the CEMTEC kiln inlet probe system (source: ENOTEC GmbH)

Märker Cement opts for CEMTEC kiln inlet measurement system from ENOTEC

Märker Cement in Harburg, south Germany, operates an FLSmidth satellite rotary kiln with a capacity of 3,000 tonnes per day, *write Dipl.Ing. (FH) Johannes Schwab, Märker Cement, and Dipl. Wirt. Ing. Fred Gumprecht, ENOTEC GmbH*. In order to further optimize its process, especially with regard to new NO_x and NH_3 emission limits, Märker Cement decided to install a kiln inlet probe system. For this purpose, several manufacturers of kiln inlet probe systems were compared and, additionally, kiln inlet probe systems in use in other cement plants were considered. Based on the experiences at the other cement plants, the decision was made to install a CEMTEC probe system from Germany's ENOTEC GmbH.

ENOTEC's CEMTEC probe system consists of a probe, a compressed air tank, a re-cooler for cooling water, a coolant control cabinet, a local control box and an analyser cabinet with built-in PLC (See Figure 1). As the probe is inserted, it rotates 90° and the plunger is activated to remove deposits in the tube. Inserted in the process, the probe tube is cooled by a water/glycol coolant and is cooled by an air/water re-cooler. A three-way valve provides a constant coolant return temperature of 85°C. In order to prevent the probe from caking stuck in the kiln inlet, the probe rotates 90° in adjustable intervals. Once a day, the probe is retracted and reinserted into the process to ensure that the probe can extract automatically in case an

Figure 1: Schematic of the CEMTEC System with air/coolant re-cooler. (source: ENOTEC GmbH)



emergency retraction is necessary.

The probe extracts the sample gas from the kiln inlet through its internal sintered metal filter. Deposits on the inner filter tube and at the sample gas inlet are removed by regular plunger movement. Plunger movement means that the internal filter tube with the plunger is regularly driven back and forth by two pneumatic pistons. All functions of the CEMTEC system such as plunger movement, probe rotating, purging and insertion/retraction can be set exactly via the PLC and adapted to on-site conditions. Cyclic impulse cleaning with purge air, which takes seconds, does not interfere with process control as the measured values are blanked out in the control room during purging. The sample gas is extracted through the heated sample gas line for sample gas conditioning and further to the gas analysers in the system cabinet. All of the CEMTEC probe's movements are completely pneumatically driven. A sufficiently large compressed air buffer tank is used as an 'energy reserve' for an emergency retraction, should the mains voltage or plant air fail. This is controlled by a SIMATIC PLC with backup battery.

Installation at Märker Cement

The challenges of the kiln inlet are flue gas temperatures of >1,100°C, high dust loads of <4,000g/m³ and caking in the riser duct. The measuring gas inlet of this gas sampling probe must be 'in front' of the kiln inlet seal, as seen from the flue gas flow direction. A nozzle with a flange must be installed horizontally at the inlet chamber, at an angle congruent to the kiln axis, in such a way that the kiln flue can be extracted without false air from the inlet seal.

Due to site conditions at Märker Cement, the probe could only be installed under the bypass outlet, i.e. on the side of the kiln that rotates towards the ground. During installation of the probe, which protrudes approximately 2.5m through the inlet chamber into the kiln, care was taken to prevent falling material from the riser duct from damaging the probe. After two years of operation, this prudent choice of installation location and positioning within the inlet chamber has paid off, as the probe has not been damaged. The probe extracts sample gas from the upper third of the kiln and protrudes about 40cm behind the kiln inlet seal into the kiln. Initially Märker Cement was concerned regarding the dust load directly at the bypass outlet as well as the representativeness of the measured values. In order to reduce the noise emission of the air/water re-cooler, a sound-insulating enclosure was installed.

For optimal probe operation and service, an additional 30m² platform had to be installed in the heat exchanger tower to the left of the inlet chamber, about 3m above the existing floor. In order to comply with the European Machinery Directive, access to the platform is only possible via a staircase, which is closed off by an electronically secured door. Access to the platform is only possible if the probe is retracted. The coolant temperature control cabinet (pump, mixing valve, control for water temperature, water volume and water pressure) was installed below the platform and is accessible at all times. The gas analyser system cabinet, (with sample gas conditioning as well as the analysers for O_2, CO, NO and SO_2) have been installed in the e-room below the heat exchanger tower for protection against weather influences. The air/water re-cooler is installed in a sound-insulating enclosure due to the noise emission of the fan. This ensures that no additional sound is emitted. Plant personnel can alter the PLC control of the CEMTEC probe from 'automatic' to 'manual' operation via the local control box, which is mounted below the platform. During manual operation the probe can be inserted, rotated, retracted or pneumatically cleaned for control purposes. An oxygen-indicating display is installed at the local control box, which allows the furnace personnel to check whether the probe is properly extracting flue gas and that the analysis is working correctly.

Figure 3: The CEMTEC probe within the kiln inlet chamber (source: ENOTEC GmbH).

Operational experience

After two years, the results of the probe measurements are very convincing and corroborate with other measurements in the kiln. This can be seen by comparing the ammonia water consumption and the measured NO_x concentration from the kiln inlet measurement (See Figure 4). The relationship between NO_x in the kiln inlet and ammonia water consumption of the SNCR system is clearly shown. The influence of O_2 and CO on the denitrification reaction was also determined by the gas analysis. As soon as sufficient O_2 is present in the kiln inlet, the NO reduction significantly improves. NO values are used to control the SNCR system. Märker Cement uses a STEAG Powitec high efficiency selective non catalytic reduction (heSNCR) system, a modern APC solution with model-predictive algorithms that is based on the artificial neural networks of online computational fluid dynamics (CFD) for temperature-controlled injection. The gas measurements of the probe at the kiln inlet, in particular of NO_x, O_2 and CO, are particularly valuable for modelling the process section relevant to the heSNCR as precisely as possible. They also allow immediate and rapid reaction to changes in the raw gas by means of their position directly at the kiln inlet. Short periods during which these values are not available during the cleaning procedures are bridged by an NO_x prediction, performed by a software sensor based on neural networks. The probe thus provides very important information in order to be able to safely meet the low NO_x and in particular NH_3 limits with low reduction agent input.

The measured O_2 and CO values at the kiln inlet enable the operator to adjust the secondary combustion air quantity accordingly. If the O_2 value is too high, the ID fan must draw more flue gas through the furnace system than necessary. If the O_2 value is too low and there is a very high CO content, the combustion is sub-optimal. Here, the operator can make appropriate changes to the settings, either to the burner or to the ID fan to achieve the best possible combustion. Thanks to the kiln inlet measurement, the combustion has been optimized so that the CO level at the chimney (emission measurement) has been reduced significantly.

Until now this was not possible because of insufficient measurement technology to understand the process, in particular the formation of CO. Furthermore, one could not estimate the

extent to which the O_2 measured at the top cyclone stage is correct, as false air that is drawn via the heat exchanger is also measured at this point. Using the kiln inlet measurement, it has been possible to accurately and continually measure the combustion gases from the burner in order to obtain a basis for an improvement in the combustion. The optimal air volume (in tonnes per hour) could be determined by means of the combustion calculation and the addition of the false air at the heat exchanger. With the addition of flue gas volume measurement, which is installed in the gas direction after the last cyclone stage, the required air quantity can now be measured and the ID fan can be controlled accordingly. Due to this constant furnace control, emissions at the chimney and energy consumption per ton of clinker can be reduced. Essentially, in a system without downstream equipment such as regenerative thermal oxidizer or calciner, the main burner must burn optimally, since any error can be difficult to correct.

Optimization of the probe

After installation of the CEMTEC analyser system at the beginning of 2015 and the training of employees, the probe has been used 24/7. It is automatically retracted once a day for visual inspection. Originally, the probe was flushed with compressed air every 60 minutes. This had to be temporarily reduced to 30 minutes due to high accumulation of dust and the associated maintenance of the analysis. The factory settings for the plunger (one minute) and for probe rotation (two minutes) of the probe could be maintained. During the winter break of 2016, further optimization was carried out with ENOTEC with regard to compressed air purging. A flushing programme was installed on the PLC software to clean the probe by means of several short pulses, similar to the compressed air guns in a heat exchanger tower. The cleaning intervals can be set flexibly on the touch panel by the operator. The probe is currently cleaned hourly by three purge pulses for a total of 36 seconds. Due to the pressure waves generated during impulse cleaning, dust deposits within the CEMTEC probe are loosened and blown back into the kiln.

Since the entire CEMTEC control is carried out via a Simatic PLC, well known to Märker Cement, the operator has also made a programme change for the probe's entry and exit. During the daily insertion and subsequent retraction, the probe automatically rotates back and forth quickly and is simultaneously purged with compressed air. Due to the rapid rotation of the probe, as previously explained, the originally-installed swivel joints on the two cooling water connections for flow and return on the probe were leaking slightly after four months of operation, a situation to which operators were alerted by the coolant/water pressure monitor. The connectors were converted to a flange connection and as a result, after more than one year of continuous operation, no further leaks in the cooling water circuit have occurred.

Maintenance

The CEMTEC probe supplies practically dust-free sample gas through its internal sintered metal filter (porosity 0.3mµ, surface area 1,900cm²) through the heated sample line to the analyser cabinet. As the CEMTEC probe is operated at 85°C, coolant temperature, the sample gas remains above the water dew point along the entire length of the sample line, from the gas inlet of the probe, to the analyser cabinet. Chemical reactions with gas molecules contained in the sample gas, as is typical of cold sample paths, do not occur. No SO_2 is lost in the condensate and there are also no 'muddy deposits' that can block probes and heated sample lines. It can be said that there is no regular manual maintenance with the CEMTEC. The maintenance staff purge the sample line twice a year, conduct general maintenance in the analyser cabinet and calibrate the analysers. A general inspection of the system takes place weekly. On the whole, the probe is very low-maintenance, despite the difficult conditions in the kiln inlet, which enables around 95% availability of process gas values during kiln operation.

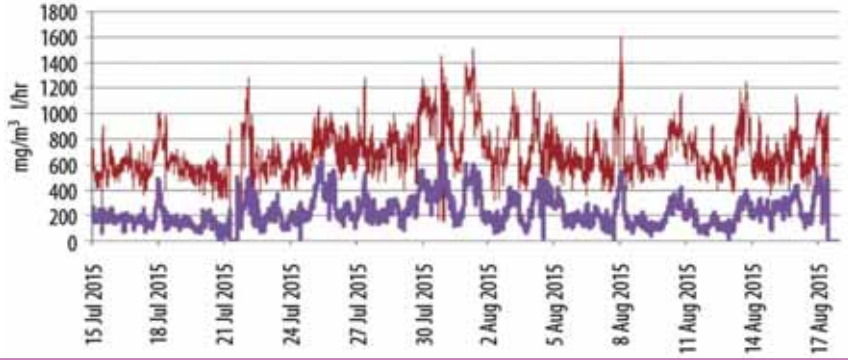
Conclusion

The CEMTEC kiln inlet measurement is a robust measuring system that is well suited to cement plants. It allows O_2, CO, NO and SO_2 parameters to be continuously measured in the kiln inlet chamber. In conjunction with additional measurements, it serves to further optimize the production of clinker. Märker Cement expects to be able to carry out further optimizations to the burner using measurements from the CEMTEC probe in future. Since the effects of adjustments to the burner combustion air without reliable gas analysis was difficult to comprehend in the past and, as the company was not able to view the flame from the outside due to the plant's satellite cooler, the CEMTEC probe systems will remain an important permanent instrument for optimization of the plant.

ENOTEC

In 1980, Fred Gumprecht established ENOTEC GmbH, which is an acronym for ENergy Optimization TEChnology. The current headquarters is located in Marienheide near Cologne. The company is a leader in flue gas and process gas analysis and produces analysers for almost all applications for combustion optimization and emissions measurement. Thanks to an improved control of processes, energy usage can be permanently reduced. The analysers, which are produced in Germany, excel in precision, quality and durability. If wished for, ENOTEC handles the service requests for all its products worldwide. Sixty workers are employed at the headquarters and in the four German regional offices. ENOTEC's international distribution and service network consists of ENOTEC USA, ENOTEC Asia, ENOTEC UK, ENOTEC East Europe and more than 50 qualified and reliable partners all around the world. Over 60% of revenues are derived from exports. DCi

Figure 4: Comparison between NO concentration in the kiln and ammonia water consumption. Red: NO; Blue: NH_4OH (source: ENOTEC GmbH)



Forest products

good news for Brazilian pulp

Patrick Knight

Fibria to start up its 'Horizonte II' line early

The world's largest producer of short fibre pulp, Fibria, expects to start up a second line at its 'Horizonte' mill in Mato Grosso do Sul state in Brazil in September, rather than in December this year. The 300–400,000 tonnes Fibria expects to produce at the new mill this year, will take Brazil's output of pulp to more than 13mt (million tonnes) in 2017. Within a couple of years, the 'Horizonte II' line is expected to be making close to 2mt a year. The short fibre pulp made from high yielding eucalyptus wood which forms most of the pulp made in Brazil, is particularly suitable for the manufacture of tissue. Demand for tissue is now growing considerably faster that the 1–2% average GDP (gross domestic product) growth of a typical country.

A total of 5.5kg of tissue per capita is now used in Brazil each year, compared with 4kg ten years ago. The continuing move of millions of people from the countryside to cities in numerous countries, particularly China, now the leading market for Brazilian pulp, means this rate of growth will continue for some time yet. Those living in cities also tend to use higher quality paper as time passes as well. In addition to its mill in Tres Lagoas, Fibria also owns a mill at Jacarei, close to the coast in Sao Paulo state, as well as the three lines which form the 2.3mt-capacity Aracruz mill complex, in Espirito Santo state, to the north of Rio de Janeiro.

The first of a new generation of short fibre mills, Aracruz I, was started up 40 years ago. Like all mills in Brazil, Aracruz gets all the wood it needs from forests close to the mill. But such have been the gains in productivity in the forests, in transportation systems, and in manufacturing, that while it costs about $200 to make each tonne of pulp at the relatively elderly Aracruz mill, it costs just over $100 to make a tonne at the new line in Mato Grosso, which despite its size and complexity, at £2.3 billion, cost significantly less than had been expected. The

Indexator unveils its next-generation harvest rotator

Next generation harvest rotator from Indexator Rotator Systems.

Indexator previewed its next-generation harvest rotator at the world's largest forestry fair, Elmia Wood 2017. "In addition to our existing product line of rotators, links and our new K100 hose swivels, we previewed one of our latest ventures, the new HX rotators which are specially adapted to handle the toughest of harvests," says Indexator's marketing director Erik Svensson.

With its original patented technique, which is completely new to this kind of rotator, Indexator is contributing towards the continuous development of the forestry industry.

"Harvests are becoming more effective, and higher demands are being placed on all of the machine components we use. Developments aren't going to stop, in fact things are only going to advance more quickly in the future," says Svensson. "We are currently putting huge resources into designing our next generation of harvest rotators, which will be able to meet future demands for even greater productivity.

Elmia Wood took place on 7–10 June in Jönköping in Sweden. It hosted more than 500 exhibitors and received around 50,000 visitors from 50 different countries.

Indexator Rotator Systems AB is a global expert in the manufacture of rotators, swivels and accessories. Today, Indexator is an extremely strong brand in the forestry, material handling and recycling industries all over the world. The company conducts world-class R&D that includes a dedicated, in-house test lab that international equipment manufacturers also turn to develop new products and functions. It currently has about 140 employees and annual sales of around SEK 230 million. A high proportion of its sales go to export, with around 80% of production being sold to more than 40 markets around the world.

two lines at Horizonte will between them soon be making close to 4mt of pulp a year, almost twice as much as the three lines at Aracruz. For this reason, Fibria has been examining the possibility of shutting down one of the elderly lines at the Espirito Santo mill. In recent years dozens, if not hundreds of high-cost elderly pulp mills in North America, Europe and even Asia have been closed down, and the customers they used to supply, have switched to buying pulp from Brazil, or another low-cost mill elsewhere, instead.

The new Puma mill belonging to the very large Klabin company, market leader in the important packaging sector in Brazil, attained 100% of its 1.5mt capacity early this year. Klabin had sales of $2.7 billion in 2016, following the start up of the Puma mill, compared with about $1 billion previously.

Because of the special needs of the packaging industry, which uses mainly very resistant 'long' fibre pulp made mainly from pine, rather than eucalyptus, the Puma mill makes two types of pulp. Of this, 1.1mt will be short fibre pulp, much of which is being commercialized by the Fibria company, 400,000 tonnes will be long fibre pulp, suitable for making 'liquid' packaging which is one of Klabin's specialities, and for which new uses are always being developed. Klabin is a major exporter of liquid packaging, much of which is sold to plants owned by the 'Tetrapak' company round the world. Another company which is benefiting from the steady growth in demand for tissue is the Chilean-owned CMPC. With little room for further expansion in Chile, CMPC has bought the Melhoramentos company, a leading player in the Brazilian domestic market for tissue, as well as the Guaira pulp mill adjacent to Porto Alegre, where output has been doubled to more than 1.5mt.

The Eldorado mill, owned by the JBS meat company, and which had been planning to build a second, 2mt, line, has delayed making a start in this, following difficulties with some of the pension funds invested in the mill by several of Brazil's state owned companies. Eldorado told these investors that the mill was worth considerably more than it actually is, which has led to distortions on dividend and other payments. The Eldorado chief executive has been sacked.

Reports state that the rate at which Brazil's tropical forest is being cut down, has increased sharply in the past few years, after slowing for a decade. The higher rate of earlier times, was largely explained by the fact that land was cleared, first for raising cattle, then for planting soya, with few restrictions. But partly because of concern from consumers in countries which imported Brazilian soya and beef that this contributes to global warming, this practice has been limited in recent years. Increased demand for valuable timber, much of which is exported, but most of which is used in Brazil itself, now seems to be the main reason for the increase in the growth of cutting. But the reduced levels in policing by the various authorities whose job it is to prevent the illegal use of forests, which is explained by the political confusion in Brazil in the past few years, is another problem. Most of the illegally logged wood is exported from the Amazon region. But in the past few years, there has been a steady growth in the production and export of mainly high quality furniture from Brazil, most of this made from wood from sustainable plantations in the south. The United States is the leading market for this product, taking 27% of the total, the United Kingdom is in second place followed by Argentina, Uruguay and Peru.

MultiDocker's units used worldwide for handling wood products

MultiDocker offers a range of cargo handlers and logistics solutions for ports, industries and terminals, including models that are ideal for handling forest products. The company's products are characterized by high efficiency, fast performance, high reliability, high machine availability and a long low-cost working life. MultiDocker produces many different configurations of its hydraulic cargo handlers, on crawler tracks or wheel undercarriages, so it can offer its customers a complete portfolio in all sizes and for all applications. Its flexible solutions enable the customer to load or unload sawn wood, round timber, chips, pellets, bags, steel products, scrap, rocks, pulpwood, gravel, and several other sorts of bulk and general cargo.

With over 30 years of experience of shipping and logistics, MultiDocker can offer logistics development services of all sizes, from single material handling products, lean time reduction calculations to analyses of the customer's total supply chain solution. The solutions it provides improve efficiency which, in turn, reduces operating costs and increases volumes handled per hour. That is a plus both for customers and for the environment.

MultiDocker's cargo handling products are based on its own industrial and innovative solutions combined with standard, reliable and well-proven Cat components. The products are built with several new fuel-saving and comfort-enabling features and benefits for owners and operators. In order to reach maximum performance, the operator needs to feel comfortable in the working environment. MultiDocker strives to deliver a cabin environment that is safe, highly developed, steady and comfortable.

MultiDocker believes high productivity is achieved by an efficient cargo handler with maximum uptime. A strong, fast and manoeuvrable cargo handler, reliable components and a well-organized service supplier make the MultiDocker products just that — highly productive. The Caterpillar service network ensures reliable service on a global stage 24/7.

Customers & segments

MultiDocker's customers are to be found within the forest, steel and other bulk industries worldwide.

Some examples include:

- In Asia, MultiDocker has delivered products and

solutions to RAPP (Riau Andalan Pulp and Paper). Rapp is a large producer of pulp and paper in Indonesia and invested in MultiDocker products as a key element in its logistics chain for its mill in Kerinci, on the island of Sumatra, Indonesia. At Sumatra the MultiDocker products discharge barges for the customer, about five million tonnes of pulp logs per year on a riverside jetty, from where the logs move on to the mill.

- In South America, MultiDocker has provided several machines to Fibria, the world's leading eucalyptus pulp producer. The machines are used at Fibria's Novo Horizonte II mill and are part of the overall expansion of Fibria's operations in this mill. The MultiDocker products are serving the wood yard and feeding lines of the mill. The concept introduced has been a successful part of the logistical operations at the mill.
- The United States is also of great interest. Through co-operation with local partner Process Inc, MultiDocker has established itself with a few units and by participating in some exhibitions where it has found significant interest for its models and solutions — especially among the inland waterways industries.
- There is a strong economic climate in its markets and industries and MultiDocker will continue to strengthen its position in the markets where it sees great potential. The company will develop its commitment to sustainable manufacturing and will seek partners in this area, electric power and hybrid operations as examples. The demand for MultiDocker's products is strong and the number of quotations it has sent recently represents great potential. MultiDocker is actively working in Europe, South America, the US and the CIS where it is finding increased interest in the solutions it offers and for its new and existing models.

Competition

MultiDocker faces significant competition on the market from companies Liebherr, Sennebogen and Mantsinen, which provide similar products. MultiDocker's strengths are broad user knowledge, high technical competence and skilled partners within product development and manufacturing.

MultiDocker's broad user knowledge and its way of suggesting logistical solutions have created great success for many customers, customers that have continued to invest in its products and solutions.

Through co-operation with Caterpillar dealers and its own representatives, MultiDocker has established a network for sales, service, and after-sales support around the globe. This is a great advantage. Not only do the dealers gain the after-sales advantages from MultiDocker products being sold; they have also experienced and expressed the need of its niche products to offer their customers a complete range of products. MultiDocker is to be seen as a complement to Cat as it provides niche products — for ports, terminals and industries— which Cat doesn't offer.

MultiDocker units are also ideal for handling other, loose, bulk products.

Global reach

MultiDocker is represented all over the world. Its headquarters is situated in Norrköping, Sweden.

The company has its own sales representatives in Europe, CIS, America and Asia. Through the co-operation with dealers all over the world, MultiDocker has established a successful network for sales, service and spare parts supply. DCi

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Bedeschi's wide product range includes equipment for industries such as Bulk Materials Handling, Marine Logistics and Mining. Services range from feasibility studies and basic engineering to complete green field, turn key installations. Design activities are performed at our technical centers in Italy and United States, while the state-of-art workshop in Italy handles all manufacturing.

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@behnbates.com
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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.

Bendezu Port Equipment GmbH
C/Camino Padre Cura, 15
Bloq. Oasis II
1º C
City
Estepona 29680
Málaga
Spain
Contact: Mr Andrés Bendezú
Job Title: General Manager
T: +34 679 449 189
E: info@bendezu.com
W: www.bendezu.com
We deal with second hand port equipment such as Mobile Harbour Cranes, shipunloaders, Material Handlers, grabs, etc, and new and fully refurbished Diesel Engines, especially for harbour cranes. We also offer Hoppers (with and without dust suppresion) and Conveyor Belts for loading vessels.

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.

Best Service Group (B.S.G.) bvba
Bogaardestraat 168M
Maldegem
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BGS Holland
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2913 LV
The Netherlands
Contact: Ms Martina Hermans
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E: info@bgsholland.nl
W: www.bgsholland.nl
Specialise in tailor made design/manufacturing of loading spout for dry granular and powdery products prone to dust problems. Produce the unique Choke Feed Scavenger.

Birrus International Pty Ltd
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Australia
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E: sales@birrus.com.au
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Blue Water Misting
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West Lakes
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BLUG Credeblug S.L.
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Contact: Mr JR Zubeldia
Job Title: Commercial Manager
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F: + 34 943 815 665
E: comercial@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
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The Netherlands
Contact: Mr Edwin Doedee
Job Title: Sales Manager, Materials Handling & Mining
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F: + 31 411 65 14 83
E: cylinders@boschrexroth.nl
W: www.boschrexroth.nl
Has a worldwide responsibility for turnkey projects and the development and production of Hydraulic Cylinders. Core competence is the development of engineered-to-order products, mostly one-off solutions for specific applications.

BossTek
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USA
Contact: Mr Mike Lewis
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DustBoss® suppression systems deliver field-proven solutions for open-area dust issues, including source-point particle management and a family of mobile units. Proprietary technology delivers superior results and reliability, able to blanket up to 280,000 square feet with a single oscillating machine.

Boyne Area Manufacturing (BAM)

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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
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Brock Grain Systems manufactures and supplies reliable commercial grain storage silos and hopper-bottom holding silos, grain dryers and controls, sweeps, bucket elevators, drag and screw conveyors, and catwalks and structural support towers.

BRUKS AB

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BRUKS Rockwood Incorporation

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Bucket Mart Inc.

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We have all Sizes/Types of New/Used Clamshells/Grapples/Misc./ buckets, Grapple buckets, Dragline buckets, Grabs, Concrete buckets, misc. for sale/rent/lease. Buckets/Grapples/Clamshells/ for Handling Scrap, Cement, Logs, Ore, Coal, Grain, Waste, Gravel, Rock, Stone, Demolition, Misc. Supplying Customers Worldwide/Around the Clock/24-7!

Buhler AG, Grain

BÜHLER

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Contact: Mr Marcel Sherrer
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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.

Buhler GmbH Grain Logistics

BÜHLER

Eichstaetter Strasse 49
Beilngries
92339
Germany
Contact: Mrs Martina Eckerle
T: + 49 8461 701 129
W: www.buhlergroup.com/grain-logistics
Bühler Grain Logistics offers package solutions, machinery and components throughout the entire food value-added chain - from an agricultural product's reception through to the final stages of processing. Whether it's a silo installation, a plant or individually tailored malting systems: Bühler is a competent global partner providing individualized on-site customer service from conception to startup. Safety, dependability and sustainability thereby form the basis of a trustful customer relationship.

Bulk Lift International

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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.

C Spencer Ltd

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Cachapuz Bilanciai Group

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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

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Çinar San.
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Calim Grabs is a manufacturer of mechanical, electro-hydraulic and remote controlled grabs.

Camar Mill Systems Ltd

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Cambelt International Corp

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Suppliers of fully moulded sidewall belting, high incline conveyor systems, dome storage reclaim systems and conveyor components.

Cargotec Sweden AB, Marine Selfunloaders

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Caterpillar Belgium

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Caterpillar Inc

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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
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Germany
Contact: Dipl.-Ing. Thomas Dreyer
T: + 49 6196 50950 20
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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

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Cavotec Group is a global leader in connecting mobile equipment. Products from the Cavotec Group manufacturing units include: Eex radio remote controls, electrical connectors up to 15kV, flexible cables, cable reels, and slipring units. Distribution is supported by 22 Cavotec sales and service companies around the world.

CDM Systems, Inc

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CDM Systems offers a comprehensive array of Bulk Conveying Systems, Components and Engineering/Design Services. With over 30 years of experience, we can provide you with conveying and bulk handling solutions for Materials from Ash through Zinc, including marine applications as well as those in hostile, severe or high-temperature environments.

Cesur Packaging Corporation

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Yüzyil Caddesi, No:64,
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Kartal 34876
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Cesur Packaging is a manufacturer of all types of FIBC 's (Type A, B, C, D for various industries - UN, Food Grade, Hygiene big bags), PP woven bags and international dunnage bags with 82 years of experience in the industry and international markets.

CHIA Espirales.es

Polígono Industrial El Sotillo S/N
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CHIA focuses its efforts on providing tailor-made solutions for port, coal and olive oil industries. Specialized equipment for industry, hoppers, ship unloaders conveyor belts, lifts, port terminals, solid bulk storehouses, ecological load and unload systems are only some of the tasks most carried out by this enterprise.

Chief Industries UK Ltd.

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International supplier of galvanized grain storage silos and ancillary equipment. Undertake complete projects or component supply to main contractors. Manufacturing companies in USA, UK and France, providing flexibility for international design standards. Experienced in countries throughout the world.

Chief Industries, Inc

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E: agri@chiefind.com
W: www.agri.chiefind.com
Chief Agri specializes in the design, manufacture and sale of grain storage systems around the world. Chief offers everything needed in a complete grain storage system, including steel grain bins, grain handling, conditioning equipment along with continuous flow grain dryers and square feed mill storage bins.

China Sonangol International (S) Pte Ltd

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Contact: Mr Eugene Tan
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Christianson Systems Inc.

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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.

Cimbria Unigrain A/S

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Job Title: Managing Director
T: + 45 72 42 24 00 / +45 96179000
F: + 45 72 42 24 99
E: cbe@cimbria.com
W: www.cimbria.com
Markets a large line of products within dustfree loading systems. Loading solutions can be delivered for all types of material using ship loading, stock piling, road and rail. Close to 30 years experience. Product programme covers all branches where bulk products are handled from agriculture to industry.

Civettini Italo & C sas (CFS Handling)

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Clariant Corporation

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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

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E: technologiessa@claudiuspeters.com
W: www.claudiuspeters.com
Worldwide suppliers of stacking and reclaiming equipment for linear or circular storage systems for a wide range of bulk commodities within process or dispatch terminals.

Cleveland Cascades Ltd

Unit 22 Dukesway
Teesside Industrial Estate
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Stockton on Tees
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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

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Contact: Mr Edgar Mansour
Job Title: President
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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@cobraamerica.com COBRA SOUTH PACIFIC; Tel: + 61 2 4722 5633, Email: terry@cobrasp.com.au

Comercial Tauro S.A.

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Condepols S.A.

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Spain
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Manufactures and commercialises big bags made of polypropylene to store or transport merchandise ranging from 500 to 2000kg, with one or four lifting points. Also manufacture liners in polyethylene or polypropylene 'Dbulk' for maritime containers to store or transport merchandise in bulk. All the products manufactured are food approved.

Conductix-Wampfler

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Weil am Rhein
79576
Germany
T: + 49 7621 662 0
F: + 49 7621 662 144
E: info.de@conductix.com
W: www.conductix.com
Conductix-Wampfler's core competency is in the development, production, consulting, and installation of tailor made, engineered solutions like festoon systems, conductor rails, cable chains, slip ring assemblies or spring and motorized cable reels that provide energy supply and data transmission for moving machinery. Other equipment/services: Energy & Data Transmission Systems.

Conductix-Wampfler Americas

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Mobile Electrification systems: Motorized reels, cable festoon systems, cable chains, slip ring assemblies (including hazardous duty), and pendant or radio remote controls. Conductix Wampfler is a global leader in the electrification of rail mounted equipment and bulk handling equipment involved in the storage and handling of all types agricultural products.

Conservatek Industries, Inc.

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W: www.conservatek.com
Designs, fabricates and installs aluminium domes and aluminium roof structures for use on tanks of various shapes and sizes. Typical applications include bulk storage enclosures.

Continental Construction (Memphis)

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Job Title: Marketing
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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
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Contact: Lou Boltik
Job Title: Director Marketing & Communications
T: + 1 205 487 6492
F: + 1 205 487 4233
E: info@continentalconveyor.com
W: www.continentalconveyor.com
The HAC® has proven itself to be a versatile and money saving alternative for elevating and lowering materials at any angle, up to and including 90° (vertical). The HAC® can be located on a ship or in a loading area.

ContiTech Transportbandsysteme GmbH

Breslauer Strasse 14
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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.

Conveyor Dynamics, Inc.

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Bellingham
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USA
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W: http://conveyor-dynamics.com/
CDI designs the longest, strongest, and most advanced belt conveyor systems in the world. Last year we commissioned the world's longest belt conveyor: a 27km conveyor in South Africa. We specialize in detailed mechanical design, software development, and control system.

Cotecna Inspection SA

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CPS Projects (Pty) Ltd

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Affiliated with CPS Projects Pty and Salzgitter SA Pty in South Africa, Portquip Pty provides mechanical shiploaders, grabs and truck loaders and unloaders.

CST Covers

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Designs, manufactures and installs large (30m to over 145m diameter) clear span aluminium domes for covering storage systems of all types. Conveyor penetrations and support can be all part of the roof design. Each dome is custom designed to the site and customer specific requirements worldwide. Cost competitive and virtually maintenance free as aluminium does not rust, rot or solar degrade.

CST Storage

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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.

CWA Engineers Inc.

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BC
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CWA is a multidisciplinary engineering and planning consultancy that provides professional services including planning, engineering, procurement, construction management, and maintenance and operations management in the bulk materials handling and ports and marine terminals sectors to industry-leading clients around the world.

DCL, Incorporated

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F: + 1 231 547 3343
E: sales@dclinc.com
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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

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De Regt is a company specialized in developing, building and installing conveyor systems and structures needed to achieve a partial or total project.

Demag Cranes & Components GmbH

Benefit recipienT: Gottwald Port Technology
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W: www.demagcranes-ag.com
Demag Cranes & Components GmbH - a subsidiary of Demag Cranes AG - is a supplier of industrial cranes and crane components for material flow, logistics and industrial drive applications. It also offers spare parts, maintenance and refurbishment services. Represented globally by approx. 5,000 employees in 22 foreign subsidiaries and agencies in 46 countries. With more than 650,000 Demag brand cranes and hoists for industrial applications in operation, the company has the largest installed base worldwide.

DeMarco Industrial Vacuum Corporation

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F: + 1 815 344 2223
E: Sales@DeMarcoVacuums.com
W: www.DeMarcoVacuums.com
Manufacturer of Patented DEMARCO Industrial Vacuum Systems and vacuum loaders for portable, stationary and central manifold systems. 10 to 300 HP

Dinnissen BV

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The Netherlands
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F: + 31 77 467 37 85
E: powtech@dinnissen.nl
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Dinnissen Process Technology specialises in handling and processing bulk materials. Complete processes for the milling, sieving, weighing, mixing, dosing, drying, expanding, extruding, vacuum coating, packaging and transporting of powders, grains and granulates. Developed, tested and manufactured in-house. 70 years international experience in bulk materials technology, machine development, processing, engineering, control, automation and service.

DMN-Westinghouse

Gieterij 3
PO Box 6
Noordwijkerhout
Zuid-Holland
NL-2210 AA
The Netherlands
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Job Title: Manager Marketing Services and PR
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F: + 31 252 375 934
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W: www.dmnwestinghouse.com
Offering tailor-made solutions in the design and manufacture of rotary valves, diverter valves and other components for the bulk solids handling industry for more than 45 years. The company's products are distributed and supported worldwide.

Dome Corp of North America

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E: sales@dome-corp-na.com
W: www.dome-corp-na.com

Dome Technology, LLC

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USA
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Job Title: Vice President of Marketing
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F: + 1 208 529 0854
E: jason.miller@dometechnology.com
W: www.dometechnology.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
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Idaho
83401
USA
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Job Title: General Manager
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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

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Dülmen
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Job Title: Marketing Manager
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F: + 49 2594 781 21
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W: www.DonaldsonToritDCE.com
Donaldson offers innovative dust collection systems. The products are engineered to improve efficiency, save energy and extend filter lifetime. The R&D engineers invented new filtration technologies for customers and their specific applications.

Doosan Benelux SA

Drève Richelle 167
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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
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Contact: Mrs Amy D. Duncan
Job Title: Marketing Manager
T: + 1 770 423 9895
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E: info@dossantosintl.com
W: www.dossantosintl.com
Foremost authority on sandwich belt high angle conveyors with the inventor of the worldwide system at the helm of the company. DSI offers discipline-oriented engineering services in mechanical and structural engineering, along with their in-house conveyor analysis software, ExConTec. Other Equipment: Sandwich Belt High Angle Conveyors.

Dry-Bag A/S

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Denmark
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F: + 45 86 19 0577
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W: www.desiccant.com

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Dust Solutions Inc

130 Bay Pines Road
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South Carolina 29906
USA
Contact: Mr Richard Posner
Job Title: President
T: + 1 843 846 3700
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E: sales@nodust.com
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Manufacturers of Dry Fog Dust Suppression Systems for conveyors, truck & rail dumps, hoppers, feeders, crushers, ship loaders/unloader. Modular systems produce fog droplets that attach to like size airborne dust particles. Functions in below freezing temperatures. DustTamer Windfences for hoppers & stockpiles.

E-Crane World Wide

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W: www.e-crane.com
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E-Crane World Wide / E-Crane International USA

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Job Title: President
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W: www.e-crane.com
Equilibrium Cranes from 6 to 40 tons capacity, reach from 64 to 147 feet with project specific lowers such as fixed, gantry, rail or crawler for bulk material handling.

ECS Eurocargo Services AS

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W: www.eurocargoservices.dk
Custom clearance
Evaluation of damages

EDGE INNOVATE. (NI) LTD

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Edge Innovate are a blue sky thinking, imaginative and creative equipment manufacturing company. With our ethos of "Innovation at Work" EDGE persist in pushing the boundaries of design and manufacturing to produce hard working, quality machinery to fit any materials handling requirement from recycling, material handling to quarrying.

Egis Ports

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Elgin Engineering and Construction

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W: www.elgininindustries.com
An international consulting and engineering firm specialised in conceptual development, planning, feasibility studies, design engineering, project management, construction supervision, etc.

EMS-Tech Inc

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Job Title: Executive Assistant, Sales & Marketing
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W: www.ems-tech.net
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, transhippers, bulk elevators, receiving hoppers, storage/loadout systems, environmental controls.

Enco Engineering Inc

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Wyandotte
MI 48192
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T: + 1 734 407 2400 x 202
F: + 1 734 676 3436
E: enco@encoeng.com
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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

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Greenwood
IN
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W: www.us.endress.com
Processes control devices and measurement systems, which include level flow, pressure tank guaging, temperature and liquid analysis systems.

Engicon nv

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F: + 32 56 73 40 40
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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

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Esch Group bv

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Stas is a manufacturer (production) of transport rollers, drive and tension drums and import bearings and bearing blocks.

ESI Eurosilo bv

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Essar Industries

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W: www.euromecsrl.com
EUROMEC, born from the merger of companies Eurohydromec and Isomec, has years of experience in the material handling field and the production of products such as lifting equipment, electrohydraulic and mechanical grabs and buckets.

Euro-Tech Corporation

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PA 15215
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F: + 1 412 782 6200
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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

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3824MR
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E: hans@tramco-europe.com
W: www.tramcoinc.com
Manufactures chain, screw and bucket conveyors and 'Aerobelt' air-supported belt conveyor systems.

FAM Magdeburger Förderanlagen und Baumaschinen GmbH

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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.

FFE Ltd

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SG4 0TJ
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Figee Crane Services BV

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1500 EE
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W: www.kenz-figee.com
Engineering, manufacturing, commissioning and service of a wide range of harbour cranes and lifting systems such as grab cranes, including floating Lemniscate cranes, single and double boom cranes and gantry grab cranes.

Flexco

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Founded in 1907, this US-based company services the world's belt conveyors through subsidiaries in Mexico, England, Germany, Australia and South Africa. Perhaps best known for heavy-duty Flexco® bolt-or rivet- attached belt fasteners, the company has expanded into providing a wide range of accessory products to enhance belt conveyor performance.

Flexco Europe GmbH

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Manufacturer and distributor of mechanical belt fastening systems, installation tools, ceramic lagging, cleats and cleaners.

Flexoveyor Conveyor

3795 Paris St., Unit D
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Colorado
80239
USA
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F: + 1 303 373 5149
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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

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FLSmidth's bulk material handling systems are based on more than 70 years of experience in design, engineering, manufacturing and maintenance and are in use for the mining, processing, blending, storage and handling of any type of bulk material.

Franz Wölfer Elektromaschinenfabrik Osnabrück GmbH

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Ganz Danubius Trading Co Ltd

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Suppliers of mechanical shiploaders and unlaoders, level luffing harbour grab cranes, floating grab cranes and other bulk handling equipment.

Garwood Consulting Ltd

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Cambridgeshire
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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.

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General Kinematics specializes in vibratory and rotary equipment and solutions for bulk processing of material in the foundry, recycling, scrap, mining, minerals, food, chemical, and wood industries. Custom engineered to your unique application.

Geo - Chem Laboratories Pvt. Ltd

Geo - Chem House
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Geometrica Inc

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F: + 1 832 220 1201
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W: www.geometrica.com
Specializes in design, fabrication and erection of bulk storage enclosures requiring large, column-free interiors. Geometrica structures may span over 300m and may be galvanized steel or aluminium. Geometrica domes are used over circular, square, rectangular, and irregular piles.

Geroldinger GmbH & Co KG

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Job Title: General Manager
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W: www.geroldinger.com
Product range includes grain silos and bins, railcar loaders and unloaders, truck loaders and unloaders and hopper systems.

Getriebebau NORD GmbH & Co. KG

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The Berga product range, completely designed and assembled in Italy, is composed of handling and storage systems, loading and unloading systems on wheels or tracks with handling capacity ranging from 50 to 2000 t/h.

GOLFETTO SANGATI
A COMPANY OF PAVAN GROUP

www.golfettosangati.com - info@golfettosangati.com

Golfetto Sangati S.r.l.

Via Fratelli Bandiera, 3
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31055
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Contact: Mr Pietro Barbujani
Job Title: Product Manager, Grain Handling Systems
T: + 39 0422 476 700
F: + 39 0422 476 800
E: barbujani.p@golfettosangati.com
W: www.golfettosangati.com
Complete plants for bulk or bag handling, including pneumatic or mechanical shipunloaders (ranging from 50 to 2.000 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
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Job Title: VP Sales & Marketing
T: + 1 864 338 7793 x 102
F: + 1 864 338 8732
E: info@goodmanconveyor.com
W: www.goodmanconveyor.com
Belt conveyor idlers, screw conveyors, bucket elevators, drag conveyors.

Goodtech Solutions AS

Bjoernslettveien 2
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Norway
Contact: Mr Knut Halvorsen
Job Title: Senior Sales Manager
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W: www.portabulk.com or www.goodtech.no
Part of the Norwegian Goodtech Group, Goodtech Solutions' business network provides superior materials handling technology, services and systems, under the PORTABULK® brand, to a wide variety of user segments throughout the world.

Greystones Cargo Systems (Pty) Ltd

PO Box 41314
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W: www.greystones.co.za
Manufactures pneumatic and mechanical shiploading and unloading systems, belt conveyor systems and other bulk handling equipment.

Gulsan A.P.

Organize Sanayi Bolgesi 2 Cad. No: 18
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Guttridge Limited

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Spalding
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F: + 44 1775 765304
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W: www.guttridge.co.uk
Manufactures a range of bulk conveying and elevating equipment, as well as storage facilities.

Guven Grab and Machine Ltd. Co

Nazim Hikmet Cad 536. sk. No: 9
Aske Köyu
Cayirova
Kocaeli
41420
Turkey
Contact: Mr Engin Demir
Job Title: Sales & Export Manager
T: + 90 262 743 8858
F: + 90 262 743 1141
E: info@guvengrab.com
W: www.guvengrab.com
Established in 1984, Guven Grab & Machine (Guven Kepce Makine) has its own manufacturing facilities. Its product range includes radio remote control grabs, electro hydraulic clamshell/orange peel grabs, mechanical clamshell orange peel touch down grabs and mechanical double wired grabs. It has supplied its units to countries all over the world.

Hanson Silo Company

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Contact: Mr Mike Hanson
Job Title: Director of Business Development
T: + 1 800 843 7456
E: hscinfo@hansonsilo.com
W: www.hansonsilo.com
Hanson Silo is the leader in Modular Precast Concrete Storage Systems.

Haskoning India Pvt Ltd

13th Floor, Maithili's Signet
Plot - 39/4, Sector 30A
Vashi
Navi Mumbai
400 705
India
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Henry International Diplomatic Marine

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Contact: Mr Jim Hill
Job Title: International Sales Manager
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F: + 1 713 673 5805
E: jhill@henry.com
W: www.henry.com
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KOAMING-AIDE - Coaming joint sealant
RAM-WRAP - Pipe repair system

Horizon Conveyor Equipment

Unit 1, Hayseech Road
Halesowen
West Midlands B63 3PD
UK
Contact: Mr Alan Bowler
Job Title: Managing Director
T: + 44 121 550 2218
F: + 44 121 550 2243
E: info@horizonconveyors.co.uk
W: www.horizonconveyors.co.uk
Manufacturers of steel, plastic idler rollers and Idler Sets, conveyor belt scrapers, pulleys/drums and conveyor components.

Huadian Heavy Industries Co., Ltd.

No. 6 Auto Museum
East Road
Fengtai
Beijing 10070
China
Contact: Ms Chen Qiao
Job Title: Market Manager of Materials Handling International
T: + 86 10 6391 9524
F: + 86 10 63919548
E: chenq@chec.com.cn
W: www.hhi.com.cn; www.chec.com.cn

Hycontrol Limited

Larchwood House
Orchard Street
Redditch
B98 7DP
UK
Contact: Mr Nigel Allen
Job Title: Marketing
T: + 44 1527 406800
F: + 44 1527 406810
E: nallen@hycontrol.com
W: www.hycontrol.com
Hycontrol manufacture a wide range of level measurement instrumentation and level switches. We measure most liquid and solid materials including, slurries, pastes, powders, grains, pellets and flakes. Measuring ranges up to 80m on a wide range of silos and tanks.

IBC International Handling AB

Hamnv. 1
Falkenberg
S-311 32
Sweden
Contact: Ms Maria Penca
Job Title: Marketing Manager
T: + 46 346 56910
F: + 46 346 56918
E: sales@ibc-international.se
W: www.ibc-international.se
IBC International Handling AB is a total supplier of services and equipment for handling dry bulk goods. We focus in particular on operational security, ergonomic thinking and environmental responsibility. Main products are FIBC filling and emptying stations with adjacent equipment.

IMASA

Palacio Valdes 1
Oviedo (Asturias)
33002
Spain
Contact: Mr Amancio Garcia
T: + 34 985 22 71 78
F: + 34 985 22 25 98
E: amancio.garcia@imasa.com
W: www.imasa.com

IMGS

Mazaya Tower AA1,
Jumeirah Lakes Towers
Suite 2906
Dubai
UAE
Contact: Mr Shahbaz Alikhan
Job Title: Director
T: + 97 144 458 335
F: + 97 144 458 337
E: shahbaz@imgs.ca
W: www.imgs.ca

Inspectorate (Suisse) SA - Bureau Veritas Commodities Division

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: Agri@inspectorate.ch
W: www.inspectorate.com
Inspections and testing of various commodities worldwide.

Inspectorate America Corporation

12000 Aerospace Avenue
Suite 200
Houston
Texas 77034
USA
Contact: Mr Trace Griglione
Job Title: Operations Manager
T: + 1 504 392 7660
F: + 1 504 393 5248
E: trace.griglione@inspectorate.com
W: www.inspectorate.com

Interjute BV

PO Box 154
Hulst 4560 AD
The Netherlands
Contact: Mr Ron Segboer
Job Title: Chief Commercial Officer
T: + 31 114 311000
F: + 31 114 311512
E: rsegboer@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.

Intermodal Solutions Pty Ltd

The Zhen Building
210/33 Lexington Drive
Bella Vista
NSW 2153
Australia
Contact: Mr Garry Pinder
Job Title: Managing Director
T: + 61 400 035 548
F: + 61 288 835 195
E: gpinder@intermodalsolutions.com
W: www.pittoship.com/
Suppliers of a dust free logistics , storage and ship loading system using bulk containers and tipplers. Visit our website to see how the system works www.pittoship.com

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: bulkmatl@intersystems.net
W: www.intersystems.net
Intersystems manufacturers a complete line of enclosed belt and en-masse conveyors, bulk weighers, bucket elevators, samplers, probes, screeners, distributors, micro ingredient systems and bolted bin systems.

Italgru S.r.l

4 Via Briantea
Ambivere (BG) 24030
Italy
Contact: Mr Fabrizio Bonfanti
Job Title: C.E.O.
T: + 39 0 35 49 32 411
F: + 39 35 49 32 409
E: coms@bonfanti.com
W: www.italgru.com

J & B Grabs B.V.

Rijksstraatweg 32
Utrecht
Utrecht
3545 NA
The Netherlands
Contact: Mr Edgar Joustra
Job Title: Director
T: + 31 3066 21616
F: + 31 3066 63765
E: info@jb-grijpers.nl
W: www.jb-grabs.com
Designs, engineers and manufactures mechanical and hydraulic grabs for all kinds of bulk material.

Jansen & Heuning

Bulk Handling Systems
Duinkerkenstraat 11
Groningen 9723 BN
The Netherlands
Contact: Mr Bart Klimp
Job Title: Marketing & Sales
T: + 31 50 312 64 48
F: + 31 50 313 80 18
E: bk@jh.nl
W: www.jh.nl

JEM International

6873 Martindale
Shawnee
Kansas 66218
USA
Contact: Mr James Mattson
T: + 1 913 441 4788
F: + 1 913 441 1711
E: info@JemScales.com
W: www.JemBaggingScales.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 Joseph Pitkin
Job Title: Marketing Manager
T: + 1 978 649 3300 (ext 127)
E: jpitkin@jenike.com
W: www.jenike.com
Bulk solids handling engineers with nearly 50 years of field experience. Based on the scientific approach, the company will assist with handling needs, improving the reliability of clients' existing equipment and helping to choose new equipment. The quick response engineering team provide on-site consulting services in; Testing, Modelling, Functional design, Structural design, Equipment supply and Courses/seminars.

Jim Way Enterprise Co., Ltd

No. 17 Chang Tai Street
Lin Hai Industrial Park
Hsiao Kang Dist.
Kaohsiung 81266
Taiwan
Contact: Mr Guillermo Su
Job Title: International Sales Manager
T: + 888 7 8718126
F: + 886 7 8718128
E: jw@roller.com.tw
W: www.roller.com.tw
Since its establishment in 1982 and meet the ISO certification in 1998, Jim Way is an expert belt conveyor accessories manufacturer. We focus our know-how to produce idlers, pulley laggings, belt cleaners, skirt rubber, ceramic liners, etc.

Kalenborn Kalprotect GmbH & Co. KG

Asbacher Str 50
Vettelschoss D-53560
Germany
Contact: Mr Stefan Kurtenbach
Job Title: Sales Manager
T: + 49 26 45 18 217
F: + 49 26 45 18 0
E: stefan.kurtenbach@kalenborn.com
W: www.kalenborn.com

Kinergy Corporation

7310 Grade Lane
Louisville
Kentucky 40219
USA
Contact: Mr Bill Ware
Job Title: Project Manager
T: + 1 502 366 5685
F: + 1 502 366 3701
E: bware@kinergy.com
W: www.kinergy.com
Manufacturer of vibratory machines for bulk solid material handling. Induced Vertical Flow units either discharge or densify materials placed in storage. Induced Conveying units use vibration to transport or process bulk solid materials.

King Bag & Manufacturing Co

1500 Spring Lawn Avenue
Cincinnati
OH 45223
USA
Contact: Mr Mike Jennings
Job Title: Sales Manager
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.

KINSHOFER GmbH

Hauptstrasse 76
Waakirchen
D-83666
Bavaria
Germany
T: +49 (0)8021 8899 0
F: +49 (0)8021 8899 37
E: info@kinshofer.com
W: www.kinshofer.com
KINSHOFER GmbH produces Premium Quality Attachments such as Clamshell Grabs (up to 7 cubic metres) for excavators & re-handling machines up to 100 t operating weight, HD Orange Peel, Selector and Timber Grabs. Big Bag Handlers too. Custom solutions. Catalog available.

KOCKS ARDELT KRANBAU GmbH

Branch Bremen
Weserstrasse 64
Bremen 28757
Germany
Contact: Mr Bernd Flaskamp
Job Title: Managing Director
T: +49 421 6601 319
F: +49 421 6601 367
E: bernd.flaskamp@kocksardelt.de
W: www.kocksardelt.de
Crane manufacturer (designing, fabrication, assembling, commissioning, training, after sales service in one hand for harbour cranes, shipyard cranes, balancer cranes - refurbishment, inspection, repair service for own and third party cranes)

KOCKS ARDELT KRANBAU GmbH

Heegermühler Straße 64
Eberswalde 16225
Germany
Contact: Mr Bernd Flaskamp
Job Title: Managing Director
T: + 49 421 6601 319
F: + 49 421 6601 367
E: bernd.flaskamp@kocksardelt.de
W: www.kocksardelt.de
Crane manufacturer (designing, fabrication, assembling, commissioning, training, after sales service in one hand for harbour cranes, shipyard cranes, balancer cranes - refurbishment, inspection, repair service for own and third party cranes)

Komatsu Mining Corp.

West Quay Road
Sunderland Enterprise Park
Sunderland
Tyne & Wear
SR5 2TD
UK
Contact: Mr Paul Bancroft
Job Title: Global Product Director - Conveyors
T: + 44 191 516 5353
F: + 44 191 516 5399
E: rebecca.crossley@mining.komatsu
W: https://mining.komatsu/
Previously known as Joy Global and Continental Conveyor Ltd.

KRANUNION GMBH
Spinnereistraße 13
Leipzig
04179
Germany
Contact: Ms Gabriela Schilk
Job Title: Marketing Department
T: + 49 341 49 53 212
F: + 49 341 49 53 125
E: gabriela.schilk@kranunion.de
W: www.kranunion.de
Kranunion is an association of three crane manufacturers specialised in lifting and transporting heavy loads. Kirow is the world market leader for railway cranes and slag pot carriers. Ardelt is the world market leader for double jib level luffing cranes.
Kocks is the world market leader for Goliath cranes and innovator for STS container cranes.
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LACHENMEIER MONSUN A/S
Grundtvigs Allé 176
Sønderborg
6400
Denmark
Contact: Mr Chrisitan Petersen
Job Title: Sales Director
T: + 45 74 42 24 64
F: + 45 74 43 04 04
E: mail@lachenmeier-monsun.com
W: www.lachenmeier-monsun.com

LAIDIG SYSTEMS INC
14535 Dragoon Trail
Mishawaka
Indiana
IN 46544
USA
Contact: Mr Mike Schuster
Job Title: VP of Salesc
T: + 1 574 256 0204 x 236
F: + 1 574 256 5575
E: sales@laidig.com
W: www.laidig.com
Laidig Systems Inc, provides custom-engineered bulk storage and reclaim systems as well as silos and silo reclaimers for tough, hard to handle materials and whole grains. Such materials include soybean meal, other grain meals, whole grains, wood chips, sawdust, and recycled materials.

LANGSTON COMPANIES INC.
PO Box 60
Memphis
Tennessee
38101-0060
USA
Contact: Mr Bob Langston
Job Title: President
T: + 1 901 774 4440
F: + 1 901 942 5402
E: blangston@langstonbag.com
W: www.langstonbag.com

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: kmcatee@lawrenceindustriesnow.com
W: www.tivar88.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.

LEGACY BUILDING SOLUTIONS, INC.
19500 County Road 142
South Haven
Minnesota
55382-9240
USA
Contact: Ms Sarah Cords
Job Title: Director of Marketing
T: + 1 320 258 0500
F: + 1 320 259 0087
E: marketing@legacybuildingsolutions.com
W: www.legacybuildingsolutions.com
Legacy structures harness the power of corrosion resistance, natural light, and a faster installation process for an increase in ROI. Custom engineered to spec, worldwide installation, built in half the time, warrantied in corrosive environments. Legacy Building Solutions, customized for your needs.

LIBRAN ENGINEERING AND SERVICES
C-33, First Floor
Malviya Nagar
New Delhi
110 017
India
Contact: Mr Anil Seth
Job Title: Director
T: + 91 11 266 71658
E: libranengineering@gmail.com
W: www.libranengineering.com
Feasibility studies and development of conceptual layout includind tender preparation for grain terminal.

LIBRAWERK MASCHINENFABRIK GMBH
Vossenkamp 1
Braunschweig
Lower Saxony
D-38104
Germany
Contact: Mr Klein
T: + 49 531 370980
F: + 49 531 3709888
E: info@librawerk.de
W: www.librawerk.de
Fully automatic and semi-automatic bagging units for almost all kinds of bulk goods. Big bag filling machines with a weighing range of up to 2,000kg, with capacities from 5 to 60 bags/hour.

LIEBHERR-MCCTEC ROSTOCK GMBH
(Liebherr Ship Cranes)
Liebherrstraße 1
Rostock
18147
Germany
Contact: Mr Thomas Jaehnig
Job Title: Marketing Maritime Cranes
T: + 43 50809 41 0
F: + 43 50809 41 500
E: Thomas.Jaehnig@liebherr.com

LISTENOW GMBH & CO.
Dieselstrasse 21
Rutesheim
71277
Germany
Contact: Mr Carsten Lohr
T: + 49 7152 50900
F: + 49 7152 509050
E: c.lohr@listenow.com
W: www.listenow.com
Loading equipment from 200-2000mm and length up to 24m, loading tubes - patented - PU flex, loading tubes of many materials, filter for loading equipment, electric rope winches, bellow expansion joints, collars, hoses, folding stairways, transport racks.

LOADFAST SYSTEMS LIMITED
Easter Shian
Glen Quaich
Amulree
Perthshire
PH8 0DB
UK
Contact: Mr Malcolm Gresty
Job Title: International Sales Director
T: + 44 7817 573 144
E: malcolm@loadfastsystems.com
W: www.loadfastsystems.com/
LoadFast Systems designs and manufactures controlled flow spoon chutes (spouts) and transfer points that minimise damage and dust generation in dry cargo handling. Products are designed to specific Client and operational requirements using discrete element modelling and 3D AutoCAD.

MACAWBER ENGINEERING, INC
1829 Clydesdale Street
Maryville
TN
37801-3796
USA
Contact: Mr Dean Wicks
Job Title: VP Business Development
T: + 1 800 433 2213
F: + 1 865 984 5286
E: sales@macawber.com
W: www.macawber.com
Designing and manufacturing low-velocity pneumatic conveying systems to solve your conveying needs, especially when your material is difficult to handle. With thousands of materials conveyed in virtually every industry, Macawber has remained true to its core business for 40 years with proven capability and expertise to create systems that are not only reliable and efficient but also cost-effective to operate and maintain.

MACK MANUFACTURING INC
PO Box 1559
7205 Bellingrath Road
Theodore
Alabama
36582
USA
Contact: Mr Matthew A. Davidson
Job Title: Vice President - Marketing
T: + 1 251 653 9999
F: + 1 251 653 1365
E: sales@MackMfg.com
W: www.mackmfg.com
A leader in designing and building heavy-duty high performance grapples and clamshell buckets since 1942. We are dedicated to supplying our customers with the right attachment for their application. Quality and reliability are trademarks of Mack grapples and buckets.

MANTSINEN GROUP LTD OY
Valikankaantie 3
Ylamylly
FIN-80400
Finland
Contact: Ms Mia Mantsinen
Job Title: Vice President
T: + 358 20 755 1230
F: + 358 13 252 5555
E: mia.mantsinen@mantsinen.com
W: www.mantsinen.com
Mantsinen Group manufactures highly efficient and precise hydraulic harbour cranes for bulk and general cargo operations.
Mantsinen cranes can be tailored to best suit each application. Mantsinen HybriLift® energy saving system and wide range of attachments makes the cranes economical, efficient and universal tools for stevedoring companies and harbour operators.
Other equipment/expertise: Wood handling Log stackers, subcontracting.

MAQUINAS CONDOR SA
Av Dos Estados 1383
Porto Alegre
RS
90200-001
Brazil
Contact: Mr André Meyer da Silva
Job Title: Director
T: + 55 51 2104 3388
F: + 55 51 2104 3345
E: andre@maquinascondor.com.br
W: www.maquinascondor.com.br
Founded 1959. Engineers and manufactures complete systems for solid bulk materials handling ports and terminals. Equipment range includes pneumatic grain unloading, continuous shiploading, bulk stacking, reclaiming, belt coveyor, bucket elevator and mechanical conveyor. Operating from barges up to capesize ships, to 3000 tph. Shipunloaders and shiploaders operating successfully in ports around the world.

MARTIN ENGINEERING
One Martin Place
Neponset
Illinois
IL 61345
USA
Contact: Mr Greg Milroy
Job Title: Customer Service Manager
T: + 1 309 852 2384 ext 214
F: + 1 800 814 1553
E: rickf@martin-eng.com
W: www.martin-eng.com
Supplier of conveyor components, flow aids, safety products and training to make bulk material handling cleaner, safer and more productive.

MARTIN ENGINEERING GMBH
In der Rehbach 14
Walluf
Hessen
D-65396
Germany
Contact: Mr Joachim Preiß
Job Title: Marketing Manager Europe
T: + 49 61 23 978 221
F: + 49 61 23 75 5 33
E: joachim.preiss@martin-eng.de
W: www.martin-eng.de
Conveyor Inspection (WTB) Safety training seminars, Conveyor equipment, belt cleaners, belt tracking systems, impact cradles, sealing systems , dust suppression systems, air cannons and vibrators, silo cleaning services , air supported conveying systems, inertial flow transfer chutes.

MARTIN ENGINEERING SOUTH AFRICA
PO Box 12696
Leraatsfontein
1038
South Africa
Contact: Mr Hannes Kotze
Job Title: Managing Director
T: + 27 13 656 5135
F: + 27 13 656 5129
E: hannesk@martin-eng.co.za
W: www.martin-eng.co.za
Installation & Maintenance of belt cleaners, sealing systems, impact support, belt tracking, air-cannons, screen vibrators, silo cleaning, service contracts, Martin Engineering Service Group - MESG S Class air supported conveyors, Inertial Flow chutes.

MASCHINEN UND MÜHLENBAU ERHARD MUHR GMBH
Grafenstraße 27
Brannenburg
D-83098
Germany
Contact: Mr Roland Muhr
Job Title: Managing Director
T: + 49 8034 90720
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.

MATRIX PDM ENGINEERING
445 Hutchinson Ave
Suite 740
Columbus
OH
43235
USA
Contact: Ms Katherine Smith
Job Title: Business Development
T: + 1 614 890 3456
F: + 1 614 890 1883
E: katherinesmith@matrixpdm.com
W: www.matrixpdm.com
Matrix PDM Engineering delivers complete EPC services to the grain industry for 35 years. From greenfield facilities, retrofits, and expansions our services include Owner's Engineer, multidiscipline engineering, construction management, marine and dock expertise, silo design and inspection and control systems integration.

MEGA DOME
1044 Rue Prinicipale
St-Thomas (Joliette)
Quebec
J0K 3L0
Canada
Contact: Ms Geneviève Hétu
Job Title: Marketing Coordinator
T: + 1 450 756 1042
F: + 1 450 756 8389
E: info@harnois.com
W: www.megadomebuildings.com

MEGAROLLER
17 Murphy Street
O'Connor
Canberra
WA 6163
Australia
Contact: Mr Jannie Kotze
Job Title: Director
T: + 61 8 9314 5000
F: + 61 8 9314 5500
E: sales@megaroller.com.au
W: www.megaroller.com.au

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 BRASIL INDUSTRIA E COMERCIO LTDA.
Av. Independencia, 2,500 Eden
Sorocaba
Sao Paulo
18087-050
Brasil
Contact: Mr John Cullen
Job Title: Global Marketing (Global Publications)
T: + 55 15 2102 1762

METSO MINERALS INDUSTRIES, INC.
Bulk Materials Handling
2715 Pleasant Valley Road
York
PA
17402
USA
Contact: Mr Tom Lippencott
Job Title: VP, Mineral Process Solutions Sales, USA
T: + 1 412 999 8552
F: + 1 717 849 7148
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
49720-0438
USA
Contact: Mr Walter Pair
Job Title: President and CEO
T: + 1 231 547 4000
F: + 1 231 547 9453
E: sales@midwestinternational.com
W: www.midwestmagic.com
Midwest International's specialized Vacupac™ Bustle Filters, velocity reduction modules, and vented low velocity trimming spoons make loading of grains into barges and ocean going vessels simple and dust free. Available in multiple configurations and sized to handle up to 100,000 bushels per hour, these devices can be adapted to an existing telescoping spout, or supplied as a complete telescoping solution.c

MINEBEA INTEC GMBH
Meiendorfer Strasse 205
Hamburg
D-22145
Germany
Contact: Ms Inken Martens-Teuscher
Job Title: Marketing
T: + 49 40 67960917
E: Inken.Martens-Teuscher@minebea-intec.com
W: www.minebea-intec.com
Minebea Intec is one of the market's leading industrial measuring technology companies for high-precision measurement and product inspection. We offer an extensive range of products, solutions and services for food manufacturing processes – from goods-in to goods out, including platform scales, process vessels/silo scales, checkweighers and equipment for detecting foreign objects, as well as software solutions for statistical process control and formulation applications.

MOLE•MASTER SERVICES CORPORATION™
27815 State Route 7
Marietta
Ohio 45750
USA
Contact: Mr David Laing
Job Title: General Manager
T: + 1 740 374 6726
F: + 1 740 374 5908
E: contactus@molemaster.com
W: www.molemaster.com
Silo, bin, bunker and process vessel cleanout & unclogging services and equipment. Pipe cleaning, Vacuum services, Dry ice Blasting, Media Blasting, Silo structural inspection services and Equipment cleaning.

MONOLITHIC DOME INSTITUTE
177 Dome Park Place
Italy
Texas
76651
USA
Contact: Mr David B South
Job Title: President
T: + 1 972 483 7423
E: sales@monolithic.com
W: www.monolithic.org/

Motherwell Automation
10 Sangiorgio Court
Osborne Park
West Perth
WA
6017
Australia
Contact: Mr Lawrence Sule
Job Title: Sales Manager
T: + 61 8 9212 4444
F: + 61 8 9212 4479
E: lsule@motherwell.net.au
W: www.motherwell.net.au

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 Director Fluitex
T: + 49 7304 801 33
F: + 49 7304 801 23
E: karin.albrecht@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 Lars Muller
T: + 31 15369 5444
F: + 31 15369 7864
E: info@mullerbeltex.com
W: www.mullerbeltex.com
Other Equipment: Elevators. Specialists in elevator components, buckets belts ATEX conform safety monitoring equipment. Design engineering and problem solving.
Elevator belt bolt hole punching up to 2000 mm width
Specialist in abrasion resistant polyurethane liners.

MWI Silo Systems Inc.
5001 Rd. 104 N. Easthope Perth East
Wellesley
Ontario
N0B 2T0
Canada
Contact: Mr Joel Gingerich
Job Title: Sales and Project Management
T: + 1 519 656 2341
F: + 1 519 656 3252
E: joel@mwisilo.com
W: http://mwisilo.com

Natural Grabs
Toros Caddesi Fethi bey sokak no 11
Natural Business Center
Maltepe
Istanbul
Turkey
Contact: Mr Hayrettin Yakut
T: + 90 216 380 60 03
F: + 90 216 380 65 59
E: sales@naturalgrab.com
W: www.naturalgrab.com/

NAVCO (National Air Vibrator Co)
PO Box 40563
Houston
TX
77240-0563
USA
Contact: Mr Ann Hutchinson
T: + 1 832 467 3636
F: + 1 832 467 3800
E: ben@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.

NAVCO (National Air Vibrator Co)
PO Box 40563
Houston
TX
77240-0563
USA
Contact: Mr. Trey Gros
Job Title: Marketing
T: + 1 832 467 3636
F: + 1 832 467 3800
E: trey@navco.us
W: www.navco.us
Manufacturer of high quality, industrial grade air vibrators and vibratory equipment. NAVCO is the leading expert in material flow solution using industrial vibrators and vibratory equipment.

Nectar Group Ltd
No 1 Ashton Gate
Ashton Road
Harold Hill
Romford
Essex
RM3 8UF
UK
Contact: Mr Guy Wilkes
Job Title: Commercial Director
T: + 44 1708 386 555
F: + 44 1708 386 665
E: nectar.uk@nectargroup.net
W: www.nectargroup.net
Nectar is involved in handling bulk commodities such as cereals and fertilizers in ports and/or inland locations. Involvement ranges from positioning of mobile bagging machines for spot cargoes to long term projects including terminal management and storage and logistics solutions.

Negrini Srl
via E. Torricelli n.4
Castelfranco Emilia
Modena
41013
Italy
Contact: Mr Massimo Negrini
T: + 39 059 923110
F: + 39 059 920378
E: info@negrini.org
W: www.negrini.org
Negrini srl considers the attainment of client satisfaction our primary objective, through a continuous and effective process of study and collaboration with both clients and suppliers. Professionalism and versatility towards different customer demands: this is the business philosophy of Negrini srl.

Nemag BV
Deltastraat 15
PO Box 110
Zierikzee
4300 AC
The Netherlands
Contact: Mr Riny Stoutjesdijk
Job Title: Sales Manager
T: + 31 111 418 900
F: + 31 111 416 154
E: sales@nemag.com
W: www.nemag.com
NEMAG specializes in sales and manufacture of tailormade mechanical grabs. Also rope end fittings like the NEMAG Rope Pear Socket and NEMAG Quick Release Link. NEMAG is one of the leading grab manufacturers world wide.

Neo Corp Brasil
Avenida Bento Munhoz da Rocha Neto, N°:1777
Jardim Samambaia
Paranaguá-PR
83212-000
Brazil
Contact: Mr Christopher Paolo
T: + 55 41 3122 5771
E: christopher@neocorpbr.com.br
W: http://www.ncbr.com.br/

NERAK GmbH Fördertechnik
Brigitta 5
Hambühren
D-29313
Germany
Contact: Mr Edgar Bleeker
Job Title: Marketing
T: + 49 50 84 944 0
F: + 49 50 84 944 222
E: bleeker@nerak.de
W: www.nerak.com
Conveying on combined horizontal/vertical paths is our strength. The NERAK rubber block chain is the basis for the world wide success of NERAK conveyors: reliable, nearly maintenance free, without any lubrication and very silent, operating in various industries.

Neuero Industrietechnik GmbH
Neuerostrasse 1
Melle
D-49324
Germany
Contact: Eng. Andreas Haeuser
Job Title: Sales & Project Manager
T: + 49 5422 9503 26
F: + 49 5422 9503 50
E: a.haeuser@neuero.de
W: www.neuero.com
NEUERO offers a wide range of pneumatic ship unloaders up to 800 t/h and ship loaders with Neuero KIKO system and loading capacities up to 3.000 t/h.
Bulk handling products varies from grain to alumina and biomass. Special unloading systems with rotating feeder for non-free flowing materials are also available.

Nilfisk SpA
Via Porrettana 1991
Zocca
Modena
41059
Italy
Contact: Dr Leonardo Bianco
Job Title: Director of Marketing
T: + 39 059 973 00 00
F: + 39 059 973 00 99
E: industrial-vacuum@nilfisk.com
W: www.nilfisk.com
Nilfisk SpA is the world leader in the production of industrial vacuums, pneumatic conveyors, centralized vacuum systems and high power vacuums.

NK Tehnologija SIA
120Z Dzelzavas Street
Riga
LV-1021
Latvia
Contact: Ms Veronika Kartisova
Job Title: Marketing & Publications
T: + 371 67271092
F: + 371 67271038
E: nkteh@nkteh.lv
W: www.nkteh.lv
Industrial design, engineering and assembly company specializing in dry bulk material handling projects and lifting equipment since 2001. In addition to shiploaders, weigh hoppers and container tilting spreaders we supply solutions for integrated bulk handling systems and equipment allocation.

NMH s.r.o
Priemyselná 4608/10
Sered'
926 01
Slovakia
Contact: Ms Veronika Kreml
Job Title: Marketing Manager
T: + 42 131 230 4441
E: v.kreml@nmh-sro.com
W: www.nmh-sro.com

Nordströms Konstruktionsbyrå
Storgatan 58
Umeå
SE-903 30
Sweden
Contact: Mr Peter Vedin
Job Title: Marketing
T: + 46 90 1136 4500
F: + 46 90 1330 69
E: arletun@nordstroems.se
W: www.nordstroems.se
The company, established 1981, is a supplier of turnkey plants and custom-made equipment for general dry bulk solids and aggregate material handling. The product portfolio includes belt and worm conveyors; telescopic loading chutes; weighing scales; silos, bins and hoppers; feeders and valves. Machines are parametrically adjusted to meet individual client's needs on terms of specifications and capacities.

Nordstrong Equipment Ltd
5895 Ambler Drive
Mississauga
Ontario
L4W 5B7
Canada
Contact: Mr Bill Van Duyn
Job Title: Sales Manager
T: + 1 289 562 6402
F: + 1 289 562 6445
E: wmvanduyn@nordstrongequipment.com
W: www.nordstrongequipment.com
Provides range of material handling equipment including belt, drag, screw and pipe conveyors and bucket elevators.

O B Wiik AS
Industriveien 13
Skedsmokorset
2020
Norway
Contact: Mr Ole Gregersen
Job Title: Export & Marketing Director
T: + 47 64 83 55 00
F: + 47 64 83 55 01
E: ole.gregersen@obwiik.no
W: www.obwiik.com
WiikHall Storage Tents are used for storage of food and non-food items within the construction segment, industry in general, Storage and logistics, Oil and gas. WiikHalls are installed in more than 100 countries. Size: in widths from 4 to 100 meter. Unlimited length in 5 meter sections.

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.orthosprojects.com
Orthos Projects, specialists in bulk materials handling, have taken over the operation of E&F services. Their Dockside Mobile Loaders have gained a technological lead in eliminating spillage and controlling dusty products from Ports operations. Their range of Filters eliminate pollution.

ORTS GmbH Maschinenfabrik
Schwartauer Strasse 99
Sereetz
D-23611
Germany
Contact: Herr Sigvard Orts
T: + 49 451 3988515
F: + 49 451 392374
E: soj@orts-gmbh.de
W: www.orts-grabs.de
Whole range of grabs for all kind of bulk materials, dredging and scrap handling: mechanical single,- 2- and 4-rope grabs, electro- hydraulic grabs, radio controlled diesel- hydraulic grabs, repair and overhauling of grabs. All "Made in Germany".

Page Macrae Engineering
61 Aerodrome Road
Mount Maunganui
Bay of Plenty
3116
New Zealand
Contact: Mr Bruce Ennis
Job Title: Cargo Handling Equipment Manager
T: + 64 7 575 5079 Ext 810
F: + 64 7 574 8594
E: brucee@page-macrae.co.nz
W: www.page-macrae.co.nz
With over 50 years of engineering experience behind it, Page Macrae Engineering is regarded as Australasia's leading manufacturer of ship cargo handling equipment. They have commanded a reputation for delivering high quality equipment that is robust, low maintenance and highly productive, regardless of conditions and loads.

Pakiet
82-103 Stegna
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Gdansk
Poland
Contact: Mr Piotr Rzeszutek
Job Title: Director
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E: patrycja@pakiet.com
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PAM A/S
PL Brandts Allé 6
Odense SO
DK - 5220
Denmark
Contact: Mr Alfred Rasmussen
Job Title: Sales Manager
T: + 45 65 32 12 41
F: + 45 65 32 43 53
E: ar@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.
Other Equipment: Rotary valves

Paul Hedfeld GmbH
Hundeicker Strasse 20
Gevelsberg
58285
Germany
Contact: Mr Burkhard Hedfeld
T: + 49 2332 6371
F: + 49 2332 61167
E: hedfeld@hedfeld.com
W: www.hedfeld.com
The company has produced complete installations for over 60 years for the transport of bulk goods such as bucket elevators, screw- and chain conveyors. The delivery of spare parts used in these conveyors was and is the basis of the current business.

PEBCO®
PO Box 7506
225 North 4th Street (42001)
Paducah
KY 42002-7506
USA
Contact: Mr David Finke
Job Title: VP, Sales and Marketing
T: + 1 270 442 1996
F: + 1 270 442 5214
E: sales@pebco.com
W: www.pebco.com
PEBCO® is recognized world-wide as the leading manufacturer of powder and dry bulk solids handling equipment. Products range from truck, train, and ship loading equipment to gates, valves, diverters, mass flow feeders, Cascade® and dustless loading chutes.

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Nieuwe Langeweg 40
Hoogvliet
DB 3194
The Netherlands
T: + 31 10 295 50 00
F: + 31 10 295 50 49
E: kranen@peinemann.nl
W: www.peinemann.nl

PEINER SMAG Lifting Technologies GmbH
Windmühlenbergstrasse 20-22
Salzgitter
D-38259
Germany
Contact: Mr Arnulf Köhnemann
Job Title: Area Sales Manager
T: + 49 5341 302 613
F: + 49 5341 302 424 or 606
E: arnulf.koehnemann@peiner-smag.com
W: www.peiner-smag.com
Manufacturer and supplier of a complete range of grabs, ie (electro-hydraulic) motor grabs, single-rope grabs, two- and four-rope grabs, hydraulic grabs as well as rotators (slewing units) and special grabs for all kinds of bulk materials for various applications and purposes.

Peterson Agricare & Bulk Logistics BV
Boompjes 270
Rotterdam
3011 XZ
The Netherlands
Contact: Mr Arno Maehlmann
T: + 31 10 282 3333
F: + 31 10 282 3282
E: info@peterson.nl
W: www.peterson.nl
Offers a wide range of logistic, inspection, laboratory and certification services in agribulk commodities, mineral bulk commodities, chemicals, biomass and biofuels. Complete supply chain covered from origin to destination.

Pfister Waagen Bilanciai GmbH
Linker Kreuthweg 9
Affing-Mühlhausen
D-86444
Germany
Contact: Ms Susanne Geller-Dürr
Job Title: Marketing and Sales Manager
T: + 49 82 07 9 58 99 28
F: + 49 82 07 9 58 99 29
E: marketing@pfisterwaagen.de
W: www.pfisterwaagen.de
Truck weighbridges, railway scales, platform scales, crane scales, weighing data management software, load cells, load cell units, weighing indicators.

PHB Weserhütte, S.A.
Parque Científico y Tecnológico de Gijón
C/Ada Byron, 220
Gijón
Asturias
33203
Spain
Contact: Dr Jose Ramón Prado
Job Title: Technical Commercial Director
T: + 34 984 49 56 40
F: + 34 985 13 42 22
E: joseramon.prado@pwh.es
W: http://en.grupotsk.com/
PHB Weserhütte, has over 60 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.

Pirs SAS
ZI St Hermentaire
309, Avenue de l'Europe
Draguignan
Var
83300
France
Contact: Mr Fikri El Mourabet
Job Title: International Sales Manager
T: + 33 4 98 10 6767
F: + 33 4 98 10 6768
E: info@domepirs.com
W: www.domepirs.com
Specialists in the construction of reinforced concrete dome storage for bulk products. Storage capacity can reach up to 100,000 tons depending on the product. The company has built more than 100 domes worldwide and provide engineering, materials, supervision construction and turnkey projects.

PLM Cranes B.V.
Sluisweg 21-25
Heijningen
4794 SW
The Netherlands
Contact: Mr Pieter Pulleman
Job Title: Managing Director
T: + 31 167 528510
F: + 31 167 524444
E: info@plmcranes.com
W: www.plmcranes.com
We build hydraulic and electric cranes from 50 to 2000 tm with a transhipment capacity up to approx. 2000 ton/hour. We are specialized in shipboard cranes, mobile cranes and harbour cranes for dredging, transhipping, hoisting and pile-driving.

Pneumat Systems Inc
110 Mohr Dr
Mankato
MN
56001
USA
Contact: Mr Sam Cebula
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T: + 1 507 345 4553
E: info@pneumat.com
W: http://pneumat.com/

Polymer Industries - Ultrapoly Division
2404 Center Street
Tacoma
WA
98409-7638
USA
Contact: Mr Bryan Olin
T: + 1 253 272 1217
F: + 1 253 272 1457
E: bryan.olin@polymerindustries.com
W: www.polymerindustries.com
Other equipment: wear and liner components.
UHMWPE and other olefins for impact, wear and flow applications.

Portpack UK Limited
Unit A2/G11 Enterprise Business Park
Wigwam Lane
Hucknall
Nottinghamshire
NG15 7SZ
UK
Contact: Ms Sharon Henson
Job Title: General Manager
T: + 44 1159 680130
F: + 44 1159 641926
E: portpack@portpack.biz
W: www.portpack.biz
Portpack design and manufacture containerised Mobile Bagging Systems for the direct discharge of bulk carriers in the port of arrival, with materials weighed and bagged at dockside, filled sealed bags are loaded directly onto trucks for onward distribution or delivery.

Port-Trade AS
Karetmagervej 9
Fredericia
DK 7000
Denmark
Contact: Mr Peter J Muller
Job Title: Managing Director
T: + 45 7628 0102
F: + 45 7628 0103
E: peter.muller@port-trade.com
W: www.port-trade.com
Sales and service in all Nordic countries of mobile harbour cranes, grabs, containerspreaders, shiploaders, reclaimers, material handling equipment etc.

Powertex Inc
1 Lincoln Boulevard
Rouses Point
New York
New York
12979
USA
Contact: Mr Stephen Podd
Job Title: President and CEO
T: + 1 518 297 4000
F: + 1 518 297 2634
E: stephenpodd@powertex.com
W: www.powertex.com
Powertex is a market leader in the dry bulk container liner market, with its Sea Bulk container liner system for 20' and 40' ocean containers. Powertex assist clients through Project Management, with Logistics and with Loading and Discharge Equipment - supplying equipment specifically designed for the use of bulk container liners.

Precia-Molen Nederland BV
Franse Akker 1
Breda
4824 AL
The Netherlands
Contact: Mr Frédéric Felten
Job Title: Export Manager
T: + 31 76 524 2510
F: + 31 76 522 8039
E: export@preciamolen.nl
W: www.preciamolen.nl
For almost 150 years Precia Molen is specialized in industrial weighing equipment such as weighbridges, hopperscales, baggingscales, platformscales, truckdumpers etc.

Premier Tech Chronos
1, avenue Premier
Premier Tech Campus
Rivière-du-Loup
Québec
G5R 6C1
Canada
Contact: Ms Marie-Pier Vallée
Job Title: Communications Coordinator
T: + 1 418 868 8324
F: + 1 418 862 6642
W: http://www.ptchronos.com/

Premier Tech Chronos B.V.
Meerheide 40
Eersel
Noord Brabant
5521 DZ
The Netherlands
Contact: Mr Ingo Jonas
Job Title: General Manager
T: + 31 497 514 988
F: + 31 497 514 953
E: info-eu@ptchronos.com
W: www.ptchronos.com
PREMIER TECH CHRONOS (PTC) is recognized worldwide for its innovative and customized packaging, material handling and bulk processing solutions. We are driven by innovation: we developed several state-of-the-art technologies which are still in the lead today. Our prime objective is to meet your packaging needs in the most creative and efficient way.

Premier Tech Chronos GmbH
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Hennef
53773
Germany
Contact: Mr Robert Oster
Job Title: Geschäftsführer
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F: + 49 2242 9335 186
E: info-eu@ptchronos.com
W: www.ptchronos.com
PREMIER TECH CHRONOS (PTC) is recognized worldwide for its innovative and customized packaging, material handling and bulk processing solutions. We are driven by innovation: we developed several state-of-the-art technologies which are still in the lead today. Our prime objective is to meet your packaging needs in the most creative and efficient way.

Premier Tech Chronos Ltd
Unit 1, Centurion Business Centre
Blenheim Industrial Estate
Nottingham
Notts
NG6 8WN
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Contact: Mr Peter Orm
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F: + 44 115 960 6941
E: info-eu@ptchronos.com
W: www.ptchronos.com
PREMIER TECH CHRONOS (PTC) is recognized worldwide for its innovative and customized packaging, material handling and bulk processing solutions. We are driven by innovation: we developed several state-of-the-art technologies which are still in the lead today. Our prime objective is to meet your packaging needs in the most creative and efficient way.

Primasonics International Limited
North Lakes Business Park
Flusco
Penrith
Cumbria
CA11 0JG
UK
Contact: Mr Donald Cameron
Job Title: Managing Director
T: + 44 17684 80372
F: + 44 17684 80374
E: sound@primasonics.com
W: www.primasonics.com;
www.quattrosonics.com
Primasonics designs and manufactures a range of Audiosonic Acoustic Cleaners which are used to de-bond powders allowing free flow of material. Wherever ash, dust, powders or granular material is processed, stored, generated or transported.

Procon Engineering Limited
Vestry Estate
Otford Road
Sevenoaks
Kent
TN14 5EL
UK
Contact: Mr Brian Sangster
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.

Protan International
PO Box 420
Brakerøya
Drammen
NO-3002
Norway
Contact: Mr Jørn Helle
Job Title: Direktor Protan International Roofing
T: + 47 90 51 30 72
E: jorn.helle@protan.no
W: www.protan.no

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@qplas.com
W: www.systemtivar.com
With more than 40 years experience, Quadrant EPP's SystemTIVAR® Engineering designs, fabricates and installs lining systems worldwide for use in hoppers, chutes, bins, dump bodies, railcars, ships, etc., featuring industry-leading low coefficient of friction, abrasion-resistant TIVAR® 88 family of products.

R & S S.r.L.
Via del Cmapo Sportiuo 40
Mezzana
48123
Italy
Contact: Mr Matteo Reggiani
Job Title: Corporate Marketing Communications Manager
T: + 39 0535 61 81 11
F: + 39 0544411 099
E: matteo.reggiani@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.

Rapat Asia
Clark, Philippines
Angeles
Pamapaga
061
Philippines
Contact: Mr Craig Stall
Job Title: General Manager
T: + 1 2182514261
F: + 1 2184833344
E: cstall@rapat.com
W: www.rapat.com

Rapat Corporation
919 O'Donnell Street
Hawley
MN
56549-4310
USA
Contact: Mr Ron Werner
Job Title: General Manager
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F: + 1 218 483 3535
E: info@rapat.com
W: http://www.rapat.com/

Rapidpack Corporation
Suite 207
Mazaya Tower AA1
Jameirah Lakes Towers
Dubai
UAE
Contact: Mr Peter Ascot
Job Title: Sales Manager
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F: + 9714 445 8337
E: peter@rapidpack.ca
W: www.rapidpack.ca
Rapidpack designs, engineers and manufactures state of the art bulk cargo handling machinery for ports, trading houses and shipping companies around the world.

RBL-REI France
11 Boulevard Brune
Paris
Cedex 14
75682
France
Contact: Mr Sébastien Bouhours
Job Title: Technical Sales Representative
T: + 33 2 41 21 3670
F: + 33 2 41 21 19 59
E: s.bouhours@rblrei-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
Cirencester Road
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GL6 9BH
UK
Contact: Mr Mark Evans
Job Title: Business Development Manager
T: + 44 1453 733300
F: + 44 1453 733311
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 10 , Weighlog 200 and Loadmaster series.

REEL Alesa Ltd
150 Rockland Rd
Town of Mount Royal
Quebec
H3P 2V9
Canada
Contact: Mr Jean-Pierre Desmoulins
Job Title: General Manager
T: + 1 514 937 9105 ext. 2231
F: + 1 514 937 0473
E: jean-pierre.desmoulins@reel-alesa.com
W: www.rta-alesa.com
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.

REEL Alesa Ltd
Max Hogger-Strasse 6
Zurich
CH - 8048
Switzerland
Contact: Mr Marcel Polidori
Job Title: Manager Sales & Marketing
T: + 41 44 435 3357
F: + 41 432 0666
E: marcel.polidori@reel-alesa.com
W: http://www.reel-alesa.com/
Specialised in dry bulk materials handling system for port terminals and plant, travelling pneumatic ship unloaders >600 t/h, storage systems, truck/railcar loading unloading systems, all kind of pneumatic conveying system (incl. dense phase, dilute phase, airlifts, airslides, suction systems), belt and tube conveyors, bath plant & carbon recycling plant, which includes for crushers, electrolysis pot control system, engineering services for all project activities above including civil and structural.

REMA TIP TOP AG
Gruber Straße 65
Poing
Bavaria
D-85586
Germany
Contact: Mr Marius Schaub
Job Title: Trade Press Officer
T: + 49 8121 707-10265
F: +49 8121 707-10349
W: www.rema-tiptop.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.

Representaciones Alfredo Brand y Cia. Ltda.
Casilla 16871
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Región Metropolitana
7510147
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Contact: Mr Alfredo Brand
T: + 56 222 38968
F: + 56 234 40817
E: abrandp.gm@gmail.com
W: www.abrandp.com

RHC Deutschland GmbH
Am Taennele 6
Senden-Aufheim
Bayern
D-89250
Germany
Contact: Mr Rolf Hofmann
Job Title: CEO
T: + 49 174 2050 164
F: + 49 7307 253 39
E: rhofmann@rhcheavymachinery.com
W: http://rhcheavymachinery.com/
RHC is a German company with engineering and manufacturing facilities in Europe and Asia.

River Consulting
3510 N. Causeway Blvd
Ste 515
Metairie
LA 70002
USA
Contact: Mr Kevin Fry
Job Title: Vice President
T: + 1 504 293 3900
E: kfry@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 Ltd
Coleford Road
Darnall
Sheffield
S9 5PA
UK
Contact: Mr Tris Young
Job Title: Marketing Manager
T: + 44 114 244 4221
F: + 44 114 243 3066
E: youngt@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 Projects.

Ronin GMS
No 1 Nobel Avenue
Modderfontein
Johannesburg
Gauteng
1645
South Africa
Contact: Mr Ferdinand Meyer
Job Title: Sales and Marketing Executive, Ronin Group
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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.royalhaskoningdhv.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.

Rubb Buildings Ltd
Dukesway
Team Valley Trading Estate
Gateshead
Tyne & Wear
NE11 0QE
UK
Contact: Ms Clare Wilson
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Designs, manufactures and installs bulk storage and general storage buildings from 3m span to 100m span. Supply structures for storage of all types of cargo, from coal and grain to salt. The structures are totally prefabricated and relocatable, are maintenance free and the fabric has a life expectancy of up to 25 years depending on usage.

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- Hermetically sealed against water and dirt
- Manufactured according to DIN, AFNOR, JIS, CEMA, FEM, BS

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- Totally safe and controlled roller
- Longer bearing and roller life
- Ability to supply rollers to every market worldwide

Your rollers for belt conveyors

Steel rollers - PSV series:
- perfect for mines, quarries, cement works, coal-fired electric utilities, dock installations and all bulk handling conveyors
- shaft ranging from 20 to 40 mm diameter
- tube ranging from 63 to 194 mm diameter
- minimum 30.000 theoretical bearing life
- no need for early replacements
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Contact your local RULMECA Company to discuss about this or other requirements for Idlers and Motorized Pulleys.

COMPANIES AROUND THE WORLD

www.rulmeca.com

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The RULMECA Group specializes in the production of rollers, motorized pulleys and other components (such as stations, suspended garland sets and covers) for bulk material handling applications. It is composed of 10 manufacturing units, 7 sales companies and 2 representative offices and employs more than 1100 people + temporary workers.

SAMSON MATERIALS HANDLING LTD (AUMUND GROUP)

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Specialists in design and manufacture of mobile bulk materials handling equipment for surface installation. Mobile shiploaders, stackers and import hoppers. Equipment designed for rapid onsite set-up and continuous high performance. Excellent return on investment.

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Schenck Process Group provides innovative solutions for the handling and storage of bulk materials using pneumatic and mechanical conveying technologies together with weighing, feeding and air filtration equipment to give a comprehensive package of products and services.

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SCORPIO ENGINEERING PVT. LTD

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The company engineers and manufactures a complete range of grain & flour 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 & flour handling systems for large grain processors & food processing industry.

SEABULK INC

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Design and build contractors involved with ports, self-unloaders and transshippers for bulk cargo. The firm provides turn-key logistics solutions for the transportation, storage and handling of bulk materials, prototype new developments including material handling systems for ship and open-sea transshipment.

S-E-G INSTRUMENT AB

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Servo Berkel Prior B.V. is the biggest manufacturer and supplier of weighing equipment in the Netherlands.

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SGS is the world's leading inspection, verification, testing and certification company. SGS also designs and supplies mechanical sampling systems for a wide range of bulk materials. SGS has more than 30 years experience in this field with equipment in operation throughout the world.

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We are a Chinese grab manufacturer, specializing in the shore and ship crane grabs for handling bulk cargo, such as radio remote control grabs and motor-hydraulic grabs. www.sgmcgrab.com

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Develops high-tech grabs, such as motor hydraulic bulk grab, motor hydraulic orange peel grab, wireless remote control bulk grab and contractible single rope bulk grab. Also manufactures a variety of handing tools, loading and unloading equipment, steel structure frame and other mechanical products.

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Canadian company offering turnkey engineering and construction services in bulk handling and flat storage solutions at low cost. The type of structure used is a highly versatile alternative to conventional constructions. The storage shed can be dismantled and be relocated. For more details visit www.sotecma.com.

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With extensive experience in the bulk handling sector, STEMM manufactures a wide range of grabs for harbour and industrial cranes, especially electrohydraulic clamshell and orange peel grabs and radio remote-controlled grabs with state-of-the-art construction and service concepts.
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Strudes Inc. is an Engineering Consulting Company, specializing in design for heavy industry in general and Cement Industry in particular. For markets and more information: www.strudes.com.

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Suomen Viljava Ltd is Finland's biggest grain handling and storage company. We have stores at 18 locations in south and middle Finland. The total storage capacity is 1,4 million tonnes. Our services comply with ISO 9001 and GTP standards.

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Supercargo is a GAFTA and FOSFA accredited members Superintendent and applies a Quality Management System for Supervision, Inspection and Surveys in International Trade according NP EN ISO 9001:2008

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TAIM WESER is a solid industrial organization, present in more than 60 countries and able to guarantee, with over 100 years of experience, the development and execution of any project related to its lines of manufacture: bulk handling, lifting, waste treatment and renewable energies.

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TBS Shipping Services
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Other Expertise: Pneumatic transport systems.
Supply of complete, high quality, low cost, professional dust removal systems according to ATEX.
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Telestack Limited specialize in the design, manufacture, installation and commissioning of MOBILE bulk material handling solutions for the Ports & Inland Terminals, including a range of ship-loaders / Ship Un-loaders, mobile truck un-loaders, link conveyors and hopper feeders.

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Provides engineering, representation, manufacturing and erection of industrial equipment and plants for storage, handling and weighing, as well as bagging and loading of wide ranging bulk products.

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The Grab Specialist B.V. design, develop and manufacture grabs for the dry bulk cargo-, dredging- and recycling industry. A service-oriented company, complying with the highest standards of after-sales and spare part supply service to secure productivity in your operations.

Thermo Fisher Scientific
501 - 90th Avenue NW
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MN 55433
USA
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T: + 1 800 445 3503
F: + 1 763 783 2525
E: Sales.bulk.us@thermofisher.com
W: www.thermofisher.com/bulkweighing
The Thermo Scientific Bulk Weighing & Monitoring product line for material handling in grain applications includes conveyor belt scales, weighbelt feeders, impact weighers, numerous level indication devices, speed switches and conveyor safety switches.

ThyssenKrupp Canada
1177-11th Avenue SW
Suite 500
Calgary
Alberta
2TR 1K9
Canada
Contact: Mr Steve Harrington
Job Title: Vice President Marketing
T: + 1 403 209 4431
F: + 1 403 245 5625
E: infocanada@thyssenkrupp.com
W: www.krupp.ca
Involved in the design and supply of turnkey mining and bulk materials handling projects. The product line of equipment encompasses shiploaders/ship unloaders, conveying systems, crushing systems, stackers, storage and reclamation systems.

ThyssenKrupp Industrial Solutions AG
Mining Technologies -OU
Materials Handling Germany
Ernst-Heckel-Strasse 1
St Ingbert-Rohrbach
Saarland
D-66386
Germany
Contact: Dr Wei Ye
Job Title: Head of Sales and Projects
T: + 49 6894 599 0
F: + 49 6894 599 468
E: info-mh@thyssenkrupp.com
W: www.thyssenkrupp-industrial-solutions.com
Besides individual items of machinery as listed above, thyssenkrupp Resource Technologies design and supply complete material handling plants turn-key.to the fertilizer industry (for handling of urea and phosphates etc.), the cement and mining industry, coal handling systems for power stations as well as complete port handling solutions.

ThyssenKrupp Robins, Inc.
7730 E. Belleview Ave
Suite #404
Greenwood Village
Colorado
80111-5820
USA
Contact: Mr Bill Halley
Job Title: Mechanical Engineer
T: + 1 303 770 0808
F: + 1 303 770 4522
E: bill.halley@thyssenkrupp.com
W: www.krupprobins.com
Located in Denver, Colorado the company ahs been involved for many years in the design and supply of turnkey, environmentally sensitive mining and material handling projects. The product line of equipment includes: conveying systems; crushing systems; stackers; shiploaders and ship unloaders; storage and reclamation design and supply.

Timars Svets & Smide AB
Industrivagen 12
Falkenberg
S-311 33
Sweden
Contact: Mr Peter Stenbeck
T: + 46 346 82100
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W: www.timars.se
Sweden based company specialising in bag handling equipment. The company builds filling as well as discharge machines for big sacks and also design complete production lines with equipment and education.

TMSA Tecnologia em Movimentação S/A
Avenida Bernardino Silveira
Pastoriza, 710
Bairro Sarandi
Porto Alegre
RS
91160-310
Brazil
Contact: Mr Eduardo Duro Garcia
Job Title: Marketing Manager
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F: + 55 51 2131 3330
E: marketing@tmsa.ind.br
W: www.tmsa.ind.br
The TMSA group, headquartered in Brazil with offices in LATAM and the USA, is one of the largest suppliers for bulk material handling equipment for Port Terminals, Agro Industries and Oilseed Processing Plants under turn-key, EPCM and Partnership Contract Agreements.

Tramco Europe Limited
Mendham Business Park
Hull Road
Saltend
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HU12 8DZ
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F: + 44 1482 793 920
E: David@tramcoeurope.co.uk
W: www.tramceurope.com
A global leader in bulk material handling, TRAMCO EUROPE LTD produce a complete line of high quality, robust, fully ATEX certified enclosed conveyors including TramrollTM, JetBeltTM, Bulk-FloTM, the Model G, Model RB, and Bucket Elevators.

Tramco, Inc
1020 East 19th Street
Wichita
KS 67214
USA
Contact: Mr Steve Cloud
Job Title: President
T: + 1 316 264 4604
F: + 1 316 264 7965
E: sales@tramcoinc.com
W: www.tramcoinc.com
TRAMCO has been involved in the design, application, engineering and manufacture of the worlds most complete line of chain conveyors, enclosed belt conveyors, specially designed conveyors and conveyor conversions since 1967. TRAMCO's philosophy is to produce high quality, reliable equipment that meets specific customer needs.

Translift Port Equipment Services Inc
Building 3
SRF Area
Subic Bay
Zambales
Freeport Zone 2222
Philippines
Contact: Mr John Wellington
Job Title: Managing Director
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F: + 63 47 252 6336
E: translift@transliftsubic.com

Transship Ltd
Marazlievskaya Str, 8
Odessa
65014
Ukraine
Contact: Mr Eugene Mashtakov
T: + 380 482 33 33 32
F: + 38 482 34 74 07
E: e.mashtakov@transship.ua
W: www.transship.com.ua

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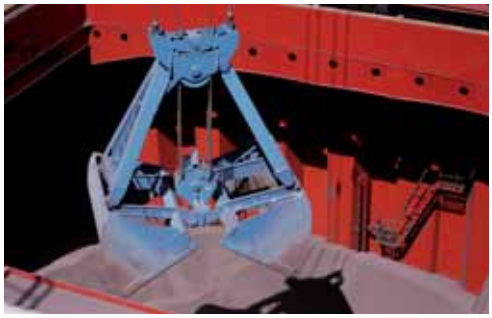

Are you looking for a new grab?

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All types of grains

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Triodetic
10 Didak Drive
Arnprior
Ontario
K7S 0C3
Canada
Contact: Mr Tim Staniszewski
Job Title: Sales & Marketing Manager
T: + 1 613 623 3434 ext 2234
F: + 1 613 622 4003
E: info@triodetic.com
W: www.triodetic.com
Designs, manufactures and installs unique enclosed storage systems for all kinds of bulk materials, including the high capacity Space Frame domes and barrel vaults.

Triple Point Technology
PO Box 495
Newcastle
NSW
2300
Australia
Contact: Mr Steve Maxwell
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T: + 61 2 4908 2222
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: Overseas Business Dept.
T: + 81 6 6862 2329
F: + 81 6 6862 8516
E: sales@tsubaki-bulk.com
W: http://tsubakimoto.com/tbs/
Produces bulk handling systems equipment, bucket, flow and pan conveyors.

TTS HuaHai Ships Equipment
18th Floor
3255 Zhou Jia Zui Road
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200093
China
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F: + 86 21 6539 7400
E: info@tts-huahai.com

V D D B (Pty) Ltd
PO Box 16985
Lyttelton
Gauteng
0140
South Africa
Contact: Mr Leonard van der Dussen
T: + 27 12 664 2300
F: + 27 12 644 2902
E: admin@vddb.co.za
W: www.vddb.co.za
Services are delivered to a variety of projects for mining and industrial clients and range from performing a particular task such as providing a bill of quantities to taking charge of a comprehensive cost structuring, capital estimating and project cost management service through to final accounts and close-out.

Veenstra Machinefabriek B.V.
De Holwert 10
KC Coevorden
7741KC
The Netherlands
Contact: Mr Paul Kuiper
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E: mach@veenstra-coevorden.nl
W: www.veenstragroup.nl

Verachtert Nederland B.V.
De Bloemendaal 8
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North Brabant
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Contact: Mr Robbert Boersma
Job Title: Sales Manager
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F: + 31 73 641 97 40
E: info@veraned.nl
W: www.veraned.nl/en
In 60 years Verachtert has developed into the market leader of Work Tools for all types of diggers and wheel loaders, and offers solutions for the specific wishes of the customer. Verachtert products represent quality and productivity.

Verstegen Grijpers BV
PO Box 1014
Nieuwegein
3430 BA
The Netherlands
Contact: Mr Eric Visser
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W: www.verstegen.net
Manufactures and supplies wide range of grabs for all bulk commodities.

Vibrafloor
Za 27 Rue de la Tuilerie
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Contact: Mr Jean-Claude Poncet
Job Title: President
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F: + 33 3 85 44 06 79
E: jc.poncet@vibrafloor.com
W: www.vibrafloor.com
VIBRAFLOOR, the modular vibrating floor, is used in various bulk industries, inside silos, ships and railway cars as a versatile reclaimer using powered gravity.

VIGAN
Rue de L'Industrie 16
Nivelles
B-1400
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Contact: Mr Nicolas Dechamps
Job Title: Managing Director
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F: + 32 67 89 50 60
E: info@vigan.com
W: www.vigan.com
VIGAN equipment are suited for most of materials in bulk such as cereals, oilseeds, alumina, chemicals and wood pellets.
As a solution provider, VIGAN can manage your bulk handling projects from initial design up to full erection under "turnkey" conditions.

WeatherSolve Structures
3127 248th St
Langley
British Columbia
V4W 1X7
Canada
Contact: Mrs Barbara Robinson
Job Title: Marketing Manager
T: + 1 604 607 7781
F: + 1 604 909 1914
E: Barbara@WeatherSolve.com
W: www.weathersolve.com
WeatherSolve Structures dust control professionals that build customized suspended fabric systems for many situations from dust / wind fencing, hopper, truck dumps, conveyor and many more situations requiring dust control. Give a call today and we will come up with a solution for you. 1.604.607.7781 or www.weathersolve.com

Webster Griffin Ltd
Brooklands Park
Farningham Road
Crowborough
East Sussex
TN6 2JD
UK
Contact: Mr Mark Wilson
Job Title: Managing Director
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F: + 44 1892 664340
E: info@webstergriffin.com
W: www.webstergriffin.com
Manufactures all types of bag and sack filling systems (including mobile systems), big bag/bulk bag filling systems, robot palletising systems for all types of grain, granular or powdered products.

Windmöller & Hölscher KG
Münsterstr. 50
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D-49525
Germany
Contact: Mrs Elisabeth Braumann
Job Title: Public Relations
T: + 49 5481 14 2929
F: + 49 5481 14 3355
E: elisabeth.braumann@wuh-group.de
W: www.wuh-group.com/
Windmöller & Hölscher - one of the leading machine manufacturers in the world for the flexible packaging industry and the global leader in bag making and bagging equipment.

Worley Parsons Canada (Westmar)
400-233 West First Street
North Vancouver
BC
V7M 1B3
Canada
Contact: Mr Stanley Cowdell
Job Title: President
T: + 1 604 985 6488
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.

ZAO SMM
1/64 Grivtsova Street
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Job Title: Commercial Director
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E: sergey@zaosmm.ru
W: www.zaosmm.ru/

	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
2000 Engineering																
4B BRAIME Components			✔	✔											✔	✔
A/S Cimbria	✔			✔		✔		✔			✔	✔	✔	✔	✔	
Ag Growth International (AGI)				✔		✔	✔	✔						✔		
Agrico Sales, Inc.	✔			✔										✔		
Agromatic AG									✔	✔					✔	
Alex Stewart Agriculture Ltd									✔	✔						
Alex Stewart International Corporation Ltd									✔							
AMECO SA																
Antar@Pressvess				✔		✔				✔				✔		
Anvil Attachments	✔					✔	✔									
Arlona Engineering			✔	✔	✔	✔	✔								✔	
AS RIKON							✔									✔
Ashton Bulk Ltd																
Atlas Manufacturing Co. Inc							✔									
August Penkert GmbH	✔			✔				✔	✔	✔		✔	✔		✔	
Aurecon	✔															
Australian Superintendence Company																
B.V. BECO							✔									
Bayards Aluminium Constructions														✔		✔
Bedeschi Mid-West Conveyor	✔		✔	✔		✔		✔				✔	✔	✔	✔	✔
Bedeschi SpA	✔		✔	✔		✔		✔						✔		
BEHN + BATES Maschinenfabrik GmbH					✔											
Bendezu Port Equipment GmbH	✔		✔	✔		✔	✔	✔							✔	✔
Bergu International AB				✔										✔		
Best Service Group (B.S.G.) bvba	✔					✔	✔					✔	✔	✔		
BGS Holland	✔				✔			✔				✔	✔	✔		
Birrus International Pty Ltd				✔												
Blue Water Misting								✔								
BLUG Credeblug S.L.							✔									
Bosch Rexroth B.V.	✔	✔	✔	✔		✔										
BossTek				✔		✔		✔								✔
Boyne Area Manufacturing (BAM)	✔	✔	✔	✔	✔	✔	✔	✔				✔	✔	✔	✔	✔
Brock Grain Systems				✔										✔		
BRUKS AB																
BRUKS Rockwood Incorporation																
Bucket Mart Inc.	✔	✔	✔	✔		✔	✔			✔		✔	✔		✔	✔
Buhler AG, Grain Logistics	✔	✔	✔	✔		✔		✔	✔	✔	✔	✔	✔	✔	✔	
Buhler GmbH Grain Logistics	✔	✔	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔
Bulk Lift International	✔				✔									✔		

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C Spencer Ltd																
Cachapuz Bilanciai Group										✔		✔			✔	✔
Calim Grab Industry	✔					✔	✔					✔	✔			
Camar Mill Systems Ltd															✔	
Cambelt International Corp				✔									✔	✔		
Cargotec Sweden AB, Marine Selfunloaders																
Caterpillar Belgium																
Caterpillar Inc												✔				
Cavotec Deutschland GmbH	✔			✔											✔	
Cavotec SA																✔
CDM Systems, Inc				✔												
Cesur Packaging Corporation					✔											
CHIA Espirales.es	✔		✔	✔		✔		✔			✔	✔	✔	✔	✔	
Chief Industries UK Ltd.				✔										✔		
Chief Industries, Inc.														✔		
China Sonangol International (S) Pte Ltd															✔	
Christianson Systems Inc.		✔		✔								✔	✔			
Cimbria Unigrain A/S	✔			✔				✔				✔	✔			
Civettini Italo & c sas (CFS Handling)							✔									
Clariant Corporation																✔
Claudius Peters Technologies S.A.S				✔										✔		
Cleveland Cascades Ltd	✔							✔				✔	✔	✔		
COBRA Europe SA				✔												
Comercial Tauro S.A.																
Condepols S.A.					✔											
Conductix-Wampfler	✔	✔	✔	✔								✔				✔
Conductix-Wampfler Americas	✔	✔	✔	✔		✔							✔	✔		✔
Conservatek Industries, Inc.														✔		
Continental Construction (Memphis)	✔	✔	✔	✔		✔		✔				✔	✔	✔		
Continental Conveyor & Equipment Co Inc				✔												
ContiTech Transportbandsysteme GmbH				✔												
Conveyor Dynamics, Inc.				✔									✔		✔	
Cotecna Inspection SA									✔							
CPS Projects (Pty) Ltd	✔						✔					✔				
CST Covers														✔		
CST Storage						✔								✔		
CWA Engineers Inc.	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
DCL, Incorporated	✔			✔	✔			✔				✔	✔	✔		
De Regt Conveyor Systems				✔												
Demag Cranes & Components GmbH			✔													✔

	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
DeMarco Industrial Vacuum Corporation	✔	✔			✔							✔	✔			
Dinnissen BV				✔	✔	✔					✔					
DMN-WESTINGHOUSE					✔					✔						
Dome Corp of North America								✔						✔		
Dome Technology, LLC														✔	✔	
DOMTEC International LLC														✔		
Donaldson Filtration Deutschland GmbH								✔								
Doosan Benelux SA			✔										✔			
Dos Santos International, LLC	✔		✔	✔											✔	✔
Dry-Bag A/S																✔
DSH Systems Ltd.	✔							✔				✔	✔	✔		
Dust Solutions Inc								✔								
E-Crane World Wide	✔		✔				✔									
E-Crane World Wide / E-Crane Int.l USA	✔		✔			✔	✔								✔	
ECS Eurocargo Services AS									✔	✔						
EDGE INNOVATE. (NI) LTD	✔			✔								✔	✔			
Egis Ports																
Elgin Engineering and Construction															✔	
EMS-Tech Inc	✔		✔	✔		✔		✔					✔	✔	✔	✔
Enco Engineering Inc	✔			✔		✔								✔	✔	
Endress + Hauser Inc										✔						
Engicon nv	✔			✔		✔						✔	✔	✔		
EQUIPO LLC							✔									
Esch Group bv																✔
ESI Eurosilo BV														✔	✔	
Essar Industries																
Euromec Srl							✔									
Euro-tech Corporation							✔									
Euro-Tramco BV			✔	✔												
FAM Magdeburger Förderanlagen und Baumaschinen GmbH	✔ ✔		✔ ✔	✔ ✔		✔ ✔						✔ ✔	✔ ✔	✔ ✔		
FFE Ltd																
Figee Crane Services BV	✔		✔			✔		✔							✔	
Flexco				✔												
Flexco Europe GmbH				✔												
Flexoveyor Conveyor				✔								✔	✔			
FLSmidth Wadgassen GmbH	✔	✔	✔	✔		✔			✔	✔		✔	✔	✔	✔	
Franz Wölfer Elektromaschinenfabrik Osnabrück GmbH																
Ganz Danubius Trading Co Ltd	✔		✔				✔									
Garwood Consulting Ltd	✔		✔	✔		✔		✔				✔	✔	✔	✔	
General Kinematics Corp.				✔						✔						
Geo - Chem Laboratories Pvt. Ltd																

	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
Geometrica Inc								✔						✔		
Geroldinger GmbH & Co KG				✔	✔	✔						✔	✔	✔		
Getriebebau NORD GmbH & Co. KG																
Golfetto Sangati s.r.l.	✔	✔	✔	✔				✔		✔	✔			✔		
Goodman Conveyor Company				✔												
Goodtech Solutions AS				✔	✔	✔	✔	✔		✔		✔	✔	✔	✔	
Greystones Cargo Systems (Pty) Ltd	✔	✔		✔												
Gulsan A.p.					✔											
Guttridge Limited			✔	✔	✔			✔						✔		
Guven Grab and Machine Ltd. Co							✔									
Hanson Silo Company														✔		
Haskoning India Pvt Ltd																
Hasler International SA										✔						
Henry International Diplomatic Marine															✔	
Horizon Conveyor Equipment				✔												
Huadian Heavy Industries Co., Ltd.																
Hycontrol Limited									✔	✔						
IBC International Handling AB				✔	✔	✔				✔					✔	
IMASA																
IMGS																
Inspectorate (Suisse) SA - BV Commodities D.									✔	✔						
Inspectorate America Corporation									✔							
Interjute BV					✔											
Intermodal Solutions Pty Ltd	✔													✔	✔	
Intersystems				✔					✔	✔				✔		✔
Italgru S.r.l																
J & B Grabs b.v.							✔									
Jansen & Heuning																
JEM International				✔	✔	✔				✔						
Jenike & Johanson Inc.						✔		✔						✔	✔	
Jim Way Enterprise Co., Ltd				✔												
Kalenborn Kalprotect GmbH & Co. KG																
Kinergy Corporation				✔		✔					✔		✔			
King Bag & Manufacturing Co					✔									✔		
KINSHOFER GmbH					✔		✔									
KOCKS ARDELT KRANBAU GmbH			✔									✔	✔			
Kocks ARDELT KRANBAU GmbH	✔		✔													
Komatsu Mining Corp.				✔												
KRANUNION GmbH																
Lachenmeier Monsun A/S				✔				✔				✔		✔		
Laidig Systems Inc						✔						✔		✔		
Langston Companies Inc.					✔											

	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
Lawrence Industries, Inc.						✔								✔	✔	✔
Legacy Building Solutions, Inc.	✔			✔		✔								✔	✔	✔
Libran Engineering and Services	✔	✔	✔	✔	✔			✔				✔	✔	✔	✔	
Librawerk Maschinenfabrik GmbH					✔					✔						
Liebherr-MCCtec Rostock GmbH																
Listenow GmbH & Co.	✔				✔							✔	✔			
LoadFast Systems Limited	✔					✔		✔				✔	✔	✔	✔	✔
Macawber Engineering, Inc				✔												
Mack Manufacturing Inc							✔									
Mantsinen Group Ltd Oy	✔		✔				✔					✔	✔			✔
Maquinas Condor SA	✔	✔	✔	✔			✔	✔								
Martin Engineering				✔				✔							✔	
Martin Engineering GmbH	✔			✔				✔	✔						✔	
Martin Engineering South Africa				✔												
Maschinen und Mühlenbau Erhard Muhr GmbH	✔											✔	✔			
Matrix PDM Engineering															✔	
Mega Dome														✔		
MegaRoller																
Merrick Industries										✔						
Metso Brasil Industria e Comercio Ltda.																
Metso Minerals Industries, Inc.	✔		✔	✔			✔						✔	✔	✔	
Midwest International Standard Products, Inc.	✔							✔				✔	✔			
Minebea Intec GmbH									✔	✔						
Mole•Master Services Corporation™						✔								✔		
Monolithic Dome Institute														✔		
Motherwell Automation																
MRS Greifer GmbH							✔									
Mühlen Sohn GmbH & Co. KG		✔										✔	✔	✔		
Muller Beltex BV				✔											✔	✔
MWI Silo Systems Inc.																
Natural Grabs																
NAVCO (National Air Vibrator Co)																✔
NAVCO (National Air Vibrator Co)																✔
Nectar Group Ltd		✔	✔	✔	✔	✔	✔			✔		✔	✔	✔	✔	
Negrini Srl							✔									
Nemag BV			✔				✔	✔								
NEO CORP BRASIL																
NERAK GmbH Fördertechnik				✔												
Neuero Industrietechnik GmbH	✔	✔	✔	✔												
Nilfisk SpA		✔		✔		✔										
NK Tehnologija SIA	✔			✔		✔						✔			✔	
NMH s.r.o																
Nordströms Konstruktionsbyrä	✔			✔		✔			✔			✔	✔	✔		
Nordstrong Equipment Ltd				✔												

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O B Wiik AS														✔		
Orthos Projects Ltd.			✔	✔		✔		✔		✔				✔		
ORTS GmbH Maschinenfabrik							✔									
PAGE MACRAE ENGINEERING						✔	✔	✔				✔				
Pakiet																✔
PAM A/S	✔	✔		✔		✔									✔	✔
Paul Hedfeld GmbH				✔												
PEBCO®	✔							✔		✔		✔	✔			
Peinemann Cranes																
PEINER SMAG Lifting Technologies GmbH							✔									
Peterson Agricare & Bulk Logistics BV									✔							
Pfister Waagen Bilanciai GmbH										✔						
PHB Weserhütte, S.A.	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Pirs SAS														✔		
PLM Cranes B.V.							✔									
Pneumat Systems Inc																
Polymer Industries - Ultrapoly Division																✔
Portpack UK Limited					✔											
Port-Trade AS	✔		✔				✔						✔	✔		
Powertex Inc					✔											✔
Precia-Molen Nederland BV					✔	✔				✔						
Premier Tech Chronos				✔	✔					✔						✔
Premier Tech Chronos b.v.				✔	✔	✔				✔						
Premier Tech Chronos GmbH				✔	✔	✔				✔						
Premier Tech Chronos Ltd				✔	✔	✔				✔						
Primasonics International Limited				✔		✔		✔				✔	✔	✔		
Procon Engineering Limited										✔						
Protan International																
PT. Bando Indonesia				✔												
Quadrant Engineering Plastics Products						✔						✔	✔			
R & S S.r.L.	✔	✔		✔	✔	✔		✔		✔		✔	✔	✔	✔	✔
Rapat Asia																
Rapat Corporation																
Rapidpack Corporation	✔	✔	✔	✔	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	
RBL-REI France				✔		✔						✔		✔		
RDS Technology										✔						
REEL Alesa Ltd	✔	✔		✔		✔						✔	✔	✔		
REEL Alesa Ltd	✔	✔		✔								✔	✔	✔		
REMA TIP TOP AG				✔					✔					✔	✔	✔
Representaciones Alfredo Brand y Cia. Ltda.																
RHC Deutschland GmbH	✔	✔	✔	✔		✔		✔	✔				✔	✔	✔	

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River Consulting															✔	
Robson Handling Technology Ltd				✔		✔				✔		✔		✔	✔	
Ronin GMS									✔	✔	✔			✔		✔
Royal Haskoning DHV															✔	
Rubb Buildings Ltd														✔		
RULMECA HOLDING S.P.A.				✔												
SAMSON Materials Handling Ltd (AUMUND Group)	✔		✔			✔		✔				✔	✔			
Saxlund International Ltd																
Schenck Process UK Limited																
Schouten Commodities BV																✔
Scorpio Engineering Pvt. Ltd	✔	✔		✔	✔	✔		✔		✔		✔	✔	✔	✔	
Seabulk Inc	✔			✔											✔	
S-E-G Instrument AB										✔						
Sempertrans France Belting Technology SAS				✔												
SENNEBOGEN Maschinenfabrik GmbH	✔		✔		✔		✔					✔	✔			
Servo Berkel Prior										✔						
SESCOTRANS (SAE)	✔	✔	✔	✔	✔	✔	✔			✔	✔	✔		✔	✔	✔
SEW-EURODRIVE GmbH & Co KG																✔
SGH Equipment Limited				✔	✔	✔		✔		✔	✔	✔		✔	✔	
SGS									✔							
SGS (Nederland) BV									✔							
SGS Australia Pty Ltd									✔							
SGS Minerals Services									✔							
Shanghai Global Machinery. Co., Ltd (SGMC)							✔									
Shanghai Janus Grab Co., Ltd.						✔	✔									
Shanghai Peiner Smag Machinery Co.,Ltd																
Shanghai Qifan Co., Ltd.	✔						✔									
Shanghai Zhenhua Port Machinery Co (ZPMC)	✔		✔												✔	
Shanthi International		✔	✔	✔		✔	✔							✔		
SIA "INDUSTRIPROF"	✔			✔	✔					✔	✔	✔	✔	✔		
Siwertell AB	✔		✔	✔								✔	✔	✔	✔	✔
SMB International GmbH	✔		✔	✔	✔										✔	
Smiley Monroe Ltd				✔												
Solimar Pneumatics														✔		
Sotecma inc				✔								✔	✔	✔	✔	
STAG AG				✔												
Stemm Equipos Industriales, S.L.							✔									
Stewart Inspection and Analysis (Pty) Ltd									✔							
Strudes Inc	✔	✔	✔	✔	✔	✔		✔	✔	✔		✔	✔	✔	✔	
Sub Con Ltd																
Suomen Viljava Oy														✔		

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Supercargo, Lda									✔	✔				✔		
Superior Industries, Inc.	✔			✔		✔						✔	✔	✔	✔	✔
Svendborg Brakes USA, LLC																
Swire CTM Bulk Logistics																✔
TAIM WESER, S.A.	✔		✔	✔		✔						✔	✔	✔		
Tank Connection														✔		
TBA Doncaster										✔				✔	✔	
TBMA Europe BV	✔				✔				✔	✔		✔	✔		✔	
TBS Shipping Services																
Tebodin Netherlands B.V.															✔	
techNaero aps								✔								
Telestack Limited	✔		✔	✔		✔		✔		✔		✔	✔			
Terex MHPS GmbH	✔	✔	✔													
Teta Mühendislik A. .		✔	✔	✔	✔					✔				✔		
The Grab Specialist b.v.							✔									
Thermo Fisher Scientific									✔	✔						
ThyssenKrupp Canada	✔	✔	✔	✔												
thyssenkrupp Industrial Solutions AG	✔		✔	✔		✔		✔	✔	✔		✔	✔	✔		
ThyssenKrupp Robins, Inc.	✔	✔	✔	✔												
Timars Svets & Smide AB					✔											
TMSA Tecnologia em Movimentação S/A	✔	✔	✔	✔		✔	✔	✔	✔			✔	✔	✔		✔
Tramco Europe Limited	✔		✔	✔									✔			
Tramco, Inc				✔												
Translift Port Equipment Services Inc		✔		✔		✔										
Transship LTD																
Triodetic								✔						✔		
Triple Point Technology																✔
Tsubakimoto Bulk Systems Corporation				✔												
TTS HuaHai Ships Equipment																✔
V D D B (Pty) Ltd																✔
Veenstra Machinefabriek B.V.	✔							✔								
Verachtert Nederland B.V.							✔									
Verstegen Grijpers BV							✔									
Vibrafloor																
VIGAN	✔	✔	✔	✔								✔	✔	✔	✔	
WeatherSolve Structures	✔	✔	✔	✔		✔		✔				✔	✔	✔		
Webster Griffin Ltd					✔											
Windmöller & Hölscher KG					✔											
Worley Parsons Canada (Westmar)	✔	✔	✔	✔		✔		✔				✔	✔	✔	✔	
ZAO SMM																

PHB

Weserhütte

Handling & Mining

Bulk marine terminals / Belt Conveyors / Ship and Barge Loaders / Ecological hoppers
Stacker units / Scraper-Reclaimer units / Bucket wheel stacker reclaimers / Pipe conveyors
Articulated boom Slewing cranes / Longitudinal stockyards and Blending beds
Circular stockyards and Blending beds

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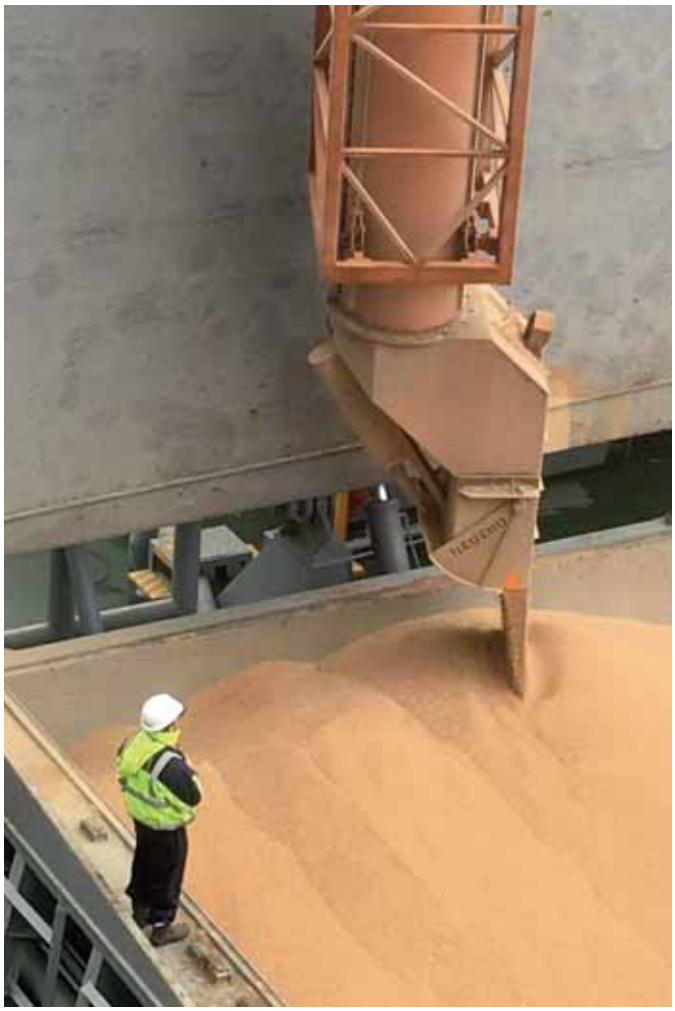





KIKO ship loaders with dust suppression head.
Efficient and environmental friendly

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