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**VOSTOCHNY PORT expansion project is close to completion**

## FEATURES

■ European Coal Trades

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Vostochny Port is a deep, warm water coal terminal in the Russian Far-East. The port handles 25 million tonnes of coal per year. High-tech coal handling equipment installed in the port and its freight advantage make coal supply through Vostochny Port highly beneficial for its customers.



VOSTOCHNY PORT expansion project is close to completion

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OCTOBER 2018 issue

featuring...



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# Grain and soya trade growth restraints

**P**otential for further growth in many components of global commodity import demand is still apparent, but various restraining influences are becoming more obvious. Although signs point to the world seaborne dry bulk trade trend staying on an upwards track, the pace of expansion seems to be slackening.

Amid increasing tensions in international trade, confidence in sustaining the distinct improvement in global economic activity seen last year is not being reinforced. Until fairly recently it could be argued that the world economy's 3.7% GDP (gross domestic product) advance last year would be raised in 2018 towards 4%. That result now seems much more difficult to achieve, and next year may see a deterioration.

## GRAIN & SOYA

One continuing positive expectation in the grain and soya sector is rising soya trade. Global movements of soyabeans and meal are forecast to increase by 2% in marketing year 2018/19 starting this month, as shown in table 1. The total could reach 216mt (million tonnes), after a 4mt rise from an estimated 212mt during the twelve months period which has just ended, based on US Dept of Agriculture data.

Although uncertainty surrounding China's soyabeans imports has been magnified by the trade dispute with the USA, growth in soya imports by other countries is expected to persist. The

China purchases total in 2018/19 is provisionally estimated to remain flat at 94mt. Other Asian countries together could see soyabeans/meal imports grow by 5% to 37mt, while the European Union volume rises by 4% to 34mt.

## IRON ORE

A generally positive steel production trend so far this year has supported raw materials usage among importing countries. But additional headwinds facing economic activity have resulted in more doubts about the future strength of manufacturing processes in steel-consuming industries and of construction work.

Figures for the first seven months of 2018, published by the World Steel Association, show that China's crude steel production rose by 6% to 533mt. In India, a key coking coal importer, steel output was 5% higher at 62mt. Elsewhere percentage growth was less rapid. South Korea achieved a 3% rise to 42mt, accompanied by a 2% rise in the EU to 102mt and a 1% rise in Japan to over 61mt. Whether these growth rates can be maintained for the full year seems somewhat doubtful, however.

## COAL

Several recent forecasts have indicated that global seaborne coal trade could grow by 3–4% in 2018 as whole, compared with last year. Higher imports into India and China seem foreseeable, while a number of smaller

importers in the Asian region could add meaningful volumes. Partly offsetting this positive picture however is the prospect of a sizeable reduction in the EU's foreign purchases this year.

Five smaller Asian importers — Malaysia, Thailand, Philippines, Pakistan and Vietnam — received steam coal totalling almost 100mt last year and their combined volume is likely to continue growing in the current period and beyond. Estimates suggest that the group could see a substantial 10–15% increase this year amid expanding coal-fired power station capacity dependent on external suppliers.

## MINOR BULKS

Steel products trade (coil, sheet, plate and other items) is one of the largest minor bulk commodity movements. Estimates show adverse influences in importing countries affecting global seaborne trade during 2018, after a decrease to below the 400mt level last year. US imports in particular have been weakening.

## BULK CARRIER FLEET

The Panamax (65–99,999dwt) bulk carrier fleet, comprising about one-quarter of the world capacity of all bulk carriers, appears set to maintain a fairly steady growth rate this year, as shown by table 2. Annual newbuilding deliveries will be much lower, but scrapping has diminished greatly and seems unlikely to see a resurgence in the remaining months.

**TABLE 1: WORLD SOYABEANS AND SOYAMEAL IMPORTS (MILLION TONNES)**

European Union	31.4	33.5	34.3	32.3	33.0	34.3
China	70.4	78.4	83.3	93.6	94.1	94.0
Other Asia	30.3	32.3	34.2	35.0	35.4	37.1
Others	38.9	41.0	43.4	44.0	49.7	50.9
<b>World total</b>	<b>171.0</b>	<b>185.2</b>	<b>195.2</b>	<b>204.9</b>	<b>212.2</b>	<b>216.3</b>
% change from previous year	+13.2	+8.3	+5.4	+5.0	+3.6	+1.9

source: US Dept of Agriculture, 12 September 2018      October/September marketing years      \* forecast

**TABLE 2: PANAMAX (65–99,999DWT) BULK CARRIER FLEET (MILLION DEADWEIGHT TONNES)**

	2013	2014	2015	2016	2017	2018*
Newbuilding deliveries	19.9	12.8	9.9	9.4	8.9	5.5
Scrapping	5.0	4.8	6.8	8.4	3.6	0.5
Losses	0.0	0.0	0.1	0.0	0.0	0.0
Plus/minus adjustments	0.1	0.1	-0.2	-0.1	0.1	0.0
<b>World fleet at end of year</b>	<b>184.3</b>	<b>192.4</b>	<b>195.2</b>	<b>196.1</b>	<b>201.5</b>	<b>206.5</b>
% change from previous year-end	+8.8	+4.4	+1.5	+0.5	+2.8	+2.5

source: Clarksons (historical data) & BSA 2018 forecasts      \*forecast

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## Why buyers of coal should care about provenance

As the Institute of Social and Ethical Accountability said: “The best and most successful organizations recognize that they will only prosper in the long term if they satisfy the aspirations of their stakeholders; including customers, suppliers, employees, local communities, investors, governments, public interest and environment groups.” This is a message that some coal producers and companies using coal in their value chain are increasingly heeding, while the rest should start doing so.



Apple, a company valued at one trillion dollars, has placed sustainability and responsibility at the very core of its business model; partially because of shareholder pressure, but mostly because it has proven to be good for business and a significant way to reduce risk. Today, Apple claims it can map the path of materials in its products as far back as the smelter and even further with others — tracking cobalt, for instance, all the way back to the source. This is a growing trend across companies that use metals and minerals in their value chains, supported by the development of instruments allowing responsible sourcing, such as the Organisation for Economic Co-operation and Development (OECD) Guiding Principles and other internationally recognized human rights instruments. Coal is not, and should not, be exempt from this trend.

Although public attention is mostly focused on the climate impact of coal (for power generation) and on the reduction of the carbon footprint of industries which use coal, such as steel and cement, it is also starting to look at where the coal being used comes from. Companies using coal in their supply chain, no matter how far along the chain, have an important role to play in leading the demand for ethical supply.

Bettercoal was created by a group of major coal buyers for exactly this purpose: to promote the continuous improvement of sustainability performance in the coal supply chain. This is done by assessing the performance of coal mining operations against the ten principles of the Bettercoal Code. Over the past five years, Bettercoal

has created and implemented a globally accepted standard for the sourcing of coal by engaging with utilities, trade unions, NGOs and mining companies. The Bettercoal Code covers ethical, social and environmental principles and provisions that are relevant to coal mining operations. Coal producers that join Bettercoal and have their operations assessed against the Code can provide their buyers with additional reassurance that they are acting responsibly. Buyers of coal that join Bettercoal can ensure that the coal they purchase comes from companies following the Bettercoal Code, thus truly managing the risks in their supply chain.

Joining Bettercoal allows companies to access credible and up-to-date data about more than 20 coal suppliers around the world, allowing them to understand and mitigate the risks in their supply chain and make informed purchasing decisions. It also enables buyers to demonstrate to their stakeholders (shareholders, end users, local civil society organizations, employees, customers, etc.) that they are participating in a global effort to drive change in the coal supply chain. Joining Bettercoal is also cost-efficient as the organization conducts assessments of multiple coal producers on behalf of its members. As one of its Members put it: “Bettercoal is the go-to organization, having built up the infrastructure including the Bettercoal Code, the processes, the Continuous Improvement Plans, the independent and qualified Assessors, open communication channels with the mining companies, and so on. And crucially, Bettercoal has already performed Site-Assessments on a large

number of the key coal producers.”

In order to truly change the face of coal, to ensure that coal is produced responsibly, buyers of coal need to face up to the challenge: they need to publicly acknowledge that coal is a vital component of their processes. For instance, why is it not public knowledge that you require 200kg of coal to make one tonne of cement, or that without coal you cannot manufacture the steel to build wind turbines?

Whilst the current membership of Bettercoal is overwhelmingly European utilities — with the exception of JERA Trading — the organization firmly believes that utilities in other parts of the globe where coal is still a major source of power generation should join Bettercoal. It especially encourages steel and cement manufacturers to join as well. Civil society, governments, financial institutions and end users are increasingly asking questions about responsibility throughout the value chain. If, to date, the great focus of attention has been coal for power generation in Europe and its provenance, there is no doubt whatsoever that this growing scrutiny will soon also affect other markets and industries.


The mining industry has put sustainability and responsibility at the forefront of their agenda, the coal industry should embrace this trend wholeheartedly. Beyond accepting the impact of coal on climate change, buyers and producers of coal must work in closer collaboration to ensure that the entire value chain is more responsible and mindful of its environmental and social impacts.



# Working towards a global responsible coal supply chain.

[bettercoal.org](http://bettercoal.org)



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**NORDEN** 

# Vostochny Port on its way to doubling coal capacity



Vostochny Port is close to completion of its main investment project aimed at increase of the terminal's annual coal throughput up to 40mt (million tonnes).

JSC Vostochny Port is the largest and the most advanced specialized coal terminal in Russia. Located in the Russian Far East, it is a perfect outlet for coal deliveries to the fast-growing Asia-Pacific market. The modern coal handling equipment installed in the terminal and its freight advantage make coal supply through Vostochny Port highly beneficial for its customers.

In 2017, total coal throughput of Vostochny Port reached 23.2mt, representing one third of Russian seaborne coal exports through the ports of Far East. In 2018, the terminal plans to increase coal handling by 8% to 25.0mt.

Long-term coal supply through Vostochny Port is secured by volumes of high-quality coal delivered from Kuzbass and other coal mining regions of Russia.

During the last ten years, the terminal handled more than 200mt of coal.

The process of transshipping coal from railcars to vessels is highly automated owing to efficient handling equipment and conveyer belt system. The overall procedure includes cleaning coal from contamination, crushing it to the required fraction, continuous sampling and chemical analyses performed by the independent survey companies.

Vostochny Port consists of two separate terminals: Specialized Coal Terminal and General Cargo Terminal.

The General Cargo Terminal can handle general and bulk cargoes and is equipped with magnetic separators, telescopic stackers, portal cranes, excavators and other modern equipment. The total capacity of the terminal is 6mt per year and currently all the facilities serve to handle coal.



The Specialized Coal Terminal is a unique technical construction representing a complete system of coal-handling equipment including conveyer belts, railcar dumpers, defrosting devices, magnetic separators, reclaimers, stackers, shiploaders, crushing and screening facilities. The terminal accounts for 75% of the Vostochny Port's overall throughput.

Vostochny Port is implementing an





# Carbo One

FROM COAL MINES TO POWER LINES

ambitious investment project aimed at construction of Phase 3 of the Specialized Coal Terminal. New terminal facilities will enable the port to increase its annual throughput to 40mt by 2020. The total cost of the project comprises more than 32 billion rubles of non-public investments.

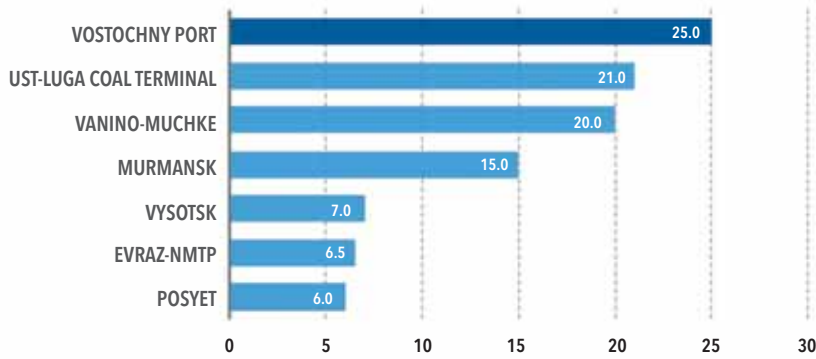
As of today, the project is more than 90% completed. The terminal is already equipped with all the major specialized coal handling equipment.

Two modern tandem car dumpers were installed this year. Each of them can unload two railcars simultaneously with 160° rotation. The new railcar dumpers are fitted with a set of high-tech equipment to ensure environmentally safe coal handling operations. Within the framework of the Phase 3 project, the enclosed railcar

	Specialized Coal Terminal		General Cargo Terminal
	Current	After expansion	Current
Coal handling, mt/year	19.0	34.0	6.0
Terminal area, hectares	45.0	98.0	24.0
Tandem railcar dumpers	2	4	-
Coal storage capacity, tonnes	600,000	1,350,000	250,000
Magnetic separators	35	64	20
Screening and crushing facilities	4	6	8
Coal crushing available, mm	0–50	0–50	0–50
Berths	2	3	4
Draught, m	16.0	16.0	11.0–12.0
DWT, t	150,000	180,000	70,000
Shiploaders	4	6	—
Loading rate, t/day, SSHINC	45,000	45,000	8,500

### Largest coal terminals in Russia

(throughput in 2018, forecast, million tonnes)



dumpers building will be equipped with quick automatic closing doors at the open car entrance and exit points, aspiration systems and ‘dry mist’ dust suppression devices.

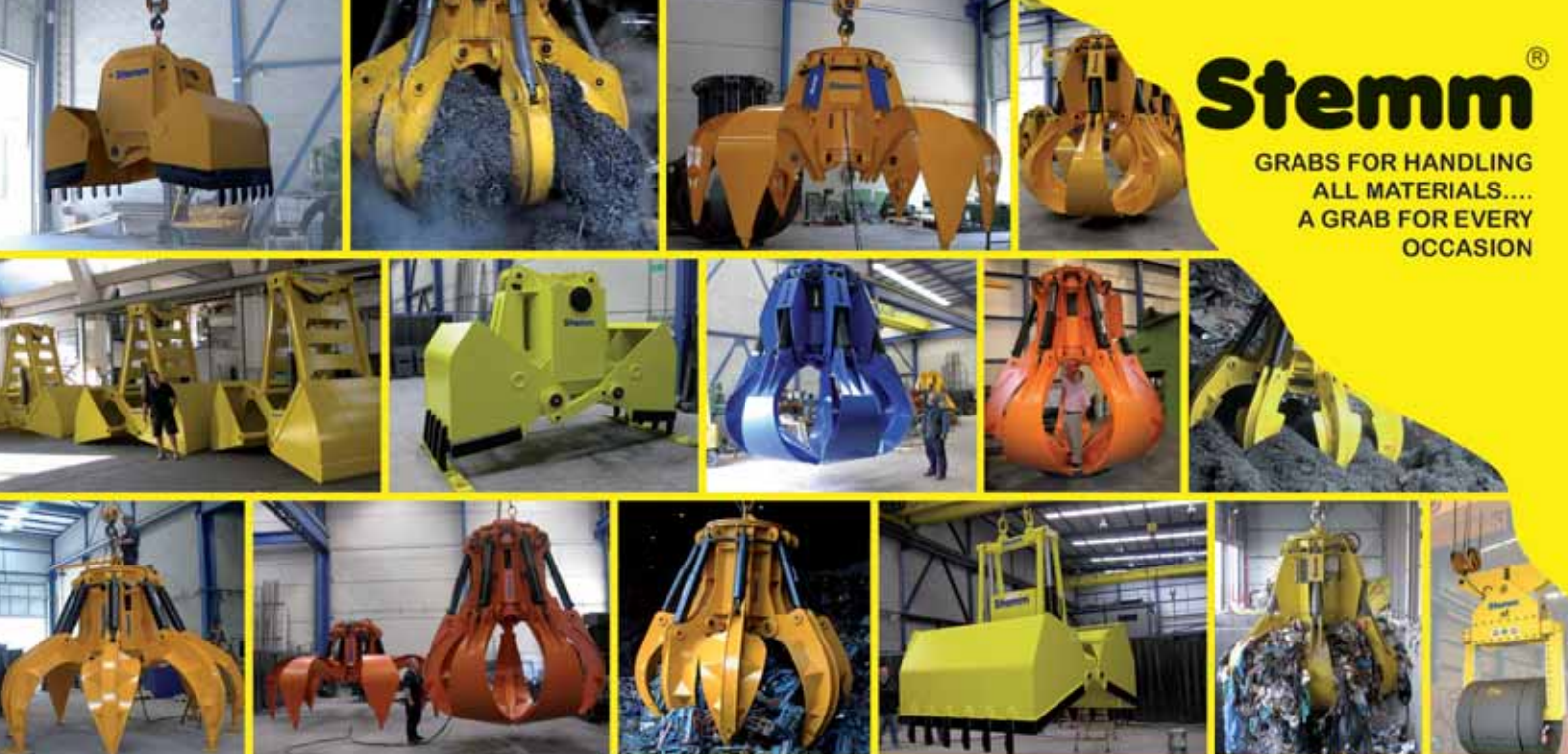
For coal transportation within the terminal, the new enclosed conveyer belts are installed to create a joined-up system with the existing conveyer of the Specialized Coal Terminal. The total length of the new conveyer belt system is about 14 kilometres.

In 2016, Vostochny Port constructed the new deep-water berth 16.5m in depth. It can accommodate Capesize vessels with deadweight up to 180,000 tonnes.



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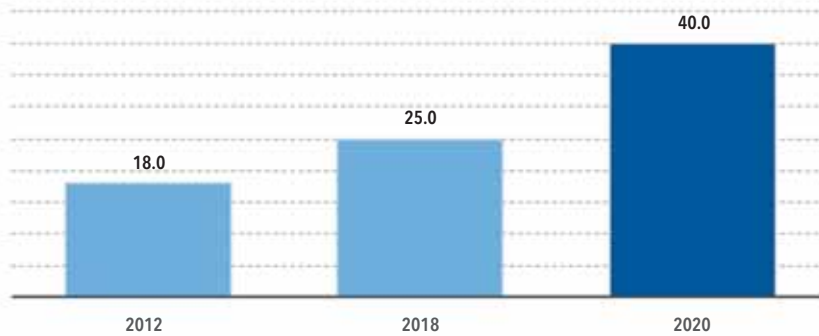


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### Annual throughput at Vostochny Port (million tonnes)



Two high-performance shiploaders with capacity up to 3,800tph (tonnes per hour) for each unit are installed at the new berth of the terminal. Manufactured in accordance with the latest technologies and requirements for ecological safety, the new shiploaders are able to deliver coal directly into a vessel hold to prevent entry of coal into the waters of Vrangal Bay.

To move coal to/from the stockpiles there was installed the new specialized handling equipment, which includes two stackers and four reclaimers with loading speed up to 3,500tph handling coal.

At the end of 2017, the new electrical substation was commissioned as part of the Phase 3 construction project. With a capacity of 32MW, it is the main supplier of electricity for Phase 3 and the back-up power supplier for the existing terminals of

Vostochny Port. The additional capacity of the new substation will be enough to meet the growing energy demand from the terminal after commissioning of the new facilities.

The project also includes the development of the federal railway infrastructure. In April 2018, the new railway park was launched at Nakhodka-Vostochnaya station. Owing to the extension of the railway park, the number of tracks increased up to 13 and the traffic-carrying capacity almost doubled. The new railway infrastructure is intended to distribute cargo traffic to the Phase 3 and the Specialized Coal Terminal of Vostochny Port, as well as to the other coal terminals in Vrangal Bay.


Furthermore, currently Vostochny Port is building the Novy railway park, which will

accommodate 12 non-public railway tracks, each capable to handle 71-car trains. The total length of the newly constructed tracks will be 19km.

Being an eco-friendly company, Vostochny Port uses the latest technologies to ensure environmental protection and health care. The port is equipped with a highly efficient air purification system, which removes coal dust from the air and the stockpile irrigation system, which prevents the spread of dust in the air. Water treatment facilities installed at the port are compliant with the international standards and provide day-to-day environmental monitoring and auditing.

Vostochny Port is the first coal terminal in the Russian Far East region awarded with international ISO 14001:2015 certificate "Environmental management systems. Requirements with guidance for use".

The environmental safety at the Specialized Coal Terminal's Phase 3 will be achieved with the use of wind shelters provided on the coal train route towards the discharge point, enclosed overturning stations, shiploaders delivering coal immediately into a vessel hold, coal store water sprinkling systems and a multilevel waste water filtering system.

Modern and highly effective facilities as well as state-of-the-art technologies are the key factors for the successful future of the terminal, which plans to increase its throughput and strengthen its positions as the leading coal port in the country. 

# Fading optimism for Europe's coal trade



Richard Scott, Bulk Shipping Analysis

Imports into Europe are one of the major features of global coal trade, resulting in a huge amount of activity at many ports within the region. But during the past three years a large reduction in annual volumes imported has been seen and, despite a pause in the past twelve months, a declining trend seems to be resuming in 2018. Moreover, numerous signs point to few reasons for optimism about a future reversal, or even easing, of the downwards trend, amid energy policy influences designed to diminish the role of coal.

Despite the weakness in recent years, coal imports into European Union countries still comprise about 12% of the global seaborne market. Steam coal used mainly in power stations is the largest component, comprising almost three-quarters of the total. The remainder is coking coal used by steel mills. While the

coking coal import volume is seeing only limited weakening, steam coal imports are being subjected to unrelenting downwards pressure resulting in a severe contraction which looks set to persist.

EU imports are dominated by Germany's large market, contributing almost one-third of the overall volume. Other major individual buyers are Spain, France, Italy and Netherlands which together have a share exceeding 40%. The United Kingdom also was in the major importers league until a few years ago but, since then, a dramatic fall has occurred, greatly reducing the country's participation to that of a much smaller player. Elsewhere, Portugal and Poland are significant.

## MACRO-ECONOMIC SUPPORT

While energy policy developments directly affecting coal consumption and imports in

the EU are often the prime focus of attention, broader macro-economic trends affecting energy demand are still influential. An economic growth revival during the past couple of years has been supportive for energy usage generally. However, as 2018 has unfolded, stronger economic growth headwinds have emerged and forecasts have become less positive.

The summer world economic update published by the International Monetary Fund in July this year suggested that GDP (gross domestic product) in the eurozone countries group could grow by 2.2% in 2018. Previously a slightly higher 2.4% was expected, continuing the improved growth rate achieved in 2017. Economic activity softened in several of the largest EU countries in the early months of the current year and, although a pick-up seemed likely to ensue, it became clearer

## EUROPE'S SEABORNE COAL IMPORTS (MILLION TONNES)

	2014	2015	2016	2017	2018*
France	13.1	12.4	12.2	14.5	13.0
Germany	53.0	52.3	52.0	46.1	41.0
Italy	19.4	19.7	17.4	15.8	15.0
Netherlands	15.8	18.0	16.6	15.5	15.0
Spain	15.7	18.0	13.2	18.4	17.0
other EU	67.8	50.9	34.9	36.1	36.0
total EU	184.8	171.3	146.3	146.4	137.0

\* forecast

source: Clarksons Research, Bulk Shipping Analysis forecasts and calculations

that a variety of restraining influences was likely to continue having an impact.

According to the IMF's outlook assessment, GDP growth in the eurozone economy is "projected to slow gradually" into 2019, when a further slackening to 1.9% is envisaged. More recently in mid-September a poll of economists conducted by Reuters reportedly pointed to marginally lower annual rates than calculated by the IMF, at 2.1% in 2018 and 1.8% in 2019. Respondents to the poll emphasized additional uncertainties created by the trade dispute between the USA and China, potentially affecting economic activity adversely in Europe and around the world.

Variations in the rate of economic growth, even when these are fairly minor, have implications for energy consumption and coal usage specifically. Activity in industries using coal indirectly through electricity consumption, or directly in steel manufacturing and some other manufacturing processes, is affected by wider trends in the economy.

#### IMPORTS RECEDING

Coal imports into the European Union last year stabilized after a large reduction in the previous two years. This flattening of the trend suggested a possibility that negative forces were perhaps becoming less severe. However, some forecasters expect a

resumed downwards trend beginning in 2018 and continuing through next year, amid further reductions in volumes by several of the main importing countries.

According to data compiled by Clarksons Research, summarized in the table, the EU's seaborne imports of coal in 2017 totalled 146.4mt (million tonnes), an almost unchanged volume compared with 146.3mt in the previous twelve months. The 2016 figure had resulted from a steep decline over the preceding period. In 2014 a 184.8mt total was recorded, so there was a 38.5mt or 21% fall in the annual volume over a two years period. The largest part of that fall was concentrated in the UK, where imports fell steeply.

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EU coking coal imports weakened relatively moderately. From 42.2mt in 2014, the total declined to 39.2mt last year, a 3mt or 7% reduction. The much larger steam coal component saw most of the overall fall, declining from 142.6mt in 2014 to 107.2mt last year, a 35mt or 25% reduction. Coking coal, required by the steel industry, is much less vulnerable to substitution by alternative energy sources than power station steam coal use which can be substituted by gas-fired power generation or displaced by renewable energy supplies.

Among the major individual importing countries within the EU, the UK has contributed by far the greatest proportion of overall weakness in recent years. Four-fifths of the reduction in annual EU seaborne coal imports reflected lost UK volumes. The remaining one-fifth reflected varying performances in other countries, not all of which were negative during the three years from 2014 to 2017. In France and Spain rises were seen, while the Netherlands experienced variations ending with only a small change. Germany and Italy were more affected by negative influences, resulting in large falls.

#### IMPORTER VARIATIONS

Germany has remained by far the largest European coal importer even though its volume has diminished. Four years ago in 2014 seaborne steam and coking coal received by German buyers totalled 53.0mt, as shown by the Clarksons data, which comprised 29% of the EU quantity. The annual volume declined by 13% to 46.1mt in 2017, comprising a slightly larger proportion, 31% of the EU quantity.

Another notable coal import decline, of

*Lignite mine in Germany.*



19%, occurred in Italy over the same period of three years, from 19.4mt to 15.8mt last year. The accompanying decrease in Netherlands was much smaller, a minimal 2% decrease from 15.8mt to 15.5mt last year. By contrast, France ended the period with a 11% rise to 14.5mt, after seeing a weakening from 13.1mt which was then more than reversed. In Spain, annual volumes in the past three years fluctuated sharply in both directions. The 2017 total for Spain was 18.4mt, 17% higher than the 15.7mt total at the beginning of the period.

The most spectacular change was the United Kingdom's plummeting import demand. In 2014 power stations, steel mills and other UK coal buyers imported 38.4mt, although that was already a 15% reduction from the preceding year. Subsequently there were massive annual falls to 7.8mt in 2016, an almost 31mt or 80% reduction in two years, followed by another relatively small 7.4mt reduction in

2017. Mostly this reflected coal-fired power station closures amid a rapid shift towards alternative fuels and renewable energy supplies, especially wind-generated electricity.

Increased use of biofuels for power generation in the UK provides a prominent illustration of negative pressures on coal demand. Expanding biomass power output has mainly reflected coal-fired plant conversions. Support is provided by the government, paying a premium price above market prices for electricity generated. The biggest user, in the form of wood pellets, is the mega-size formerly coal consuming Drax power station, where three generating units comprising half of the plant have been converted for biomass, and another unit is undergoing conversion.

Changes in domestic coal production within the EU have a limited impact on import demand. In most producing countries output has diminished as a result

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*Coal-fired power plants are losing popularity.*



of many coal-mine closures and in several countries it has been greatly reduced. Production is now concentrated in Germany and Poland. Both countries have extensive lignite or brown coal production which is not generally traded internationally.

Figures produced by Euracoal, the European Association for Coal and Lignite, show that in 2017 Germany mined 171mt of lignite plus just below 4mt of hard coal. Poland's production of these categories totalled 61mt and 66mt respectively. Hard coal output in the UK was small at 3mt and it was just below that figure in Spain. Compared with three years earlier in 2014,

all recent volumes are down, particularly for hard coal.

So changes in consumption trends have been the main influence affecting European countries' coal purchases on the international market. Steel mill consumption of, and import demand for, coking coal broadly reflected steel production trends. In the steam coal sector events in the energy market mostly driven by policy decisions were the biggest factor influencing coal consumption and import demand.

#### **POLICY DRIVERS**

Promoting cleaner energy resources is a

long-established policy priority across the European Union. This aim has involved phasing-out large scale coal-fired power stations, substituted by gas-fired units and, especially during the past few years, moving more decisively towards renewable energy which mostly comprises boosting wind-energy electricity generation.

By last year coal had a much more restricted share of electricity generation within the EU. According to calculations by the Oxford Institute for Energy Studies, coal's share was 20%, slightly below the 21% share for natural gas generation and 22% for nuclear generated electricity. Hydro-power contributed 16%, while the

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proportion generated by renewables was 18%.

European Union policy affects coal use through the Emissions Trading Scheme, air pollution directives and renewable energy targets. A focus on sustainability, mitigating climate change in particular, has been the key driver, accompanied by more attention to aspects such as energy security and industrial competitiveness.

Although power sector decarbonization is a target, the EU still has around 280 coal-fired power plants operating, ensuring at least in the short to medium term a substantial market for steam coal (and the low-grade lignite which some power stations use exclusively).

Recent reports have suggested that almost three-quarters of European coal-fired power plants, totalling over 200, are at least 30 years old, many of which may close when confronted by tough new emissions reduction requirements. A number of EU member countries have either ceased power generation from this sector, or have revealed plans to do so by a set date during the period up to 2030. In France, Italy, UK and Netherlands where target deadlines have been announced, coal-fired plants

represent about one-fifth of the EU's total electricity generation. In Germany, which has a larger presence than the four countries mentioned above together, a target date is awaited.

Another driver more related to commercial influences than regional policies is the falling cost of renewable energy. Improving wind and solar power efficiency and economics are altering perceptions of future energy supplies. But for numerous countries, closing coal-fired plants is a longer-term process, because alternatives of the magnitude required are likely to be installed over many years. Premature extensive coal plant closures could cause disrupted power supplies which would be economically problematical and perhaps politically unacceptable also.

#### A FORECAST RETREAT

Based on recent indications combined with some notional ideas, a likely outcome for EU coal imports in 2018 seems to be a reduced volume, possibly followed by continued weakening next year. Tentative Bulk Shipping Analysis calculations shown in the table suggest that a reduction of about 6% in the seaborne imports volume is

plausible this year, about 9mt lower than seen in the previous twelve months.

Partial support for this view is provided by an estimate for Germany by the country's importers group VDKi reported a few weeks ago. This association predicted that the hard coal imports volume in Germany during 2018 could be 12% below the 51.2mt seen last year, reducing the total to about 45mt. Strengthening competition from renewable energy sources was cited as a key reason explaining the negative outlook. Further coal-fired power station closures are envisaged over the years ahead, resulting in import demand cutbacks.

For the immediate future, concluding that annual EU seaborne coal imports will decline partly reflects guesswork, because the precise consequences of developments in all the individual countries are not easily predictable. While an overall increase seems highly unlikely, conceivably the total could be just flat, perhaps resulting from temporary influences providing support. Based on an extended view beyond the current year, however, most signs point to a downwards trend as a foreseeable evolution.

DCi



## True cost of operating oil-lubricated shaft systems revealed in Thordon study

Thordon Bearings has published a study highlighting the commercial and environmental benefits of seawater-lubricated propeller shaft bearing arrangements, indicating that shipowners can make substantial operational savings by giving up the outdated oil lubricated shaft.

The study, the findings of which were presented for the first time during the SMM 2018 trade fair in Hamburg, Germany, was carried out in response to the increase in oil and oil-based Environmentally Acceptable Lubricant (EAL) lubricated sterntube bearing failures, which are placing an additional and unnecessary financial burden on shipowners.

Despite the introduction of legislation to reduce shipping's impact on the oceans, together with shipowners' ever-present need to reduce operational costs,

the majority of commercial ocean-going vessels continue to use a system that is increasing risk and is costly to operate.

"It is quite staggering that over 95% of all new commercial ships continue to be built with oil lubricated propeller shafts — a system that is not only operationally expensive but environmentally questionable," said Craig Carter, Thordon Bearing's Director of Marketing and Customer Service.

"Our *Future, Our Ocean* paper presents the case for water lubrication to shipowners and shipbuilders as a commercially and technically viable way of increasing profits while achieving corporate sustainability goals."

The 14-page document explains that while the low capital expenditure of an oil-lubricated system is an obvious attraction, any financial advantage is completely lost once the vessel enters the water. This, cites Thordon Bearings, is due to the costs associated with purchasing lubricating oils, the regular maintenance and unscheduled drydockings required to repair or replace faulty shaft seals.

While emergency seal repairs alone can cost anywhere from US\$150,000 to US\$300,000, excluding drydock costs, the paper furthers that the constant topping up of an oil-lubricated system, combined with the regularity of aft seal failure, can cost shipowners in excess of US\$6.5 billion over a 25-year period.



The paper reveals that for a typical single screw bulk carrier turning a 650mm shaft, the total cost of operating an oil-lubricated system over 25 years (including capital investment) is US\$605,925 against \$370,000 for a seawater-lubricated arrangement.

Although part of the cost of operating an oil-lubricated system is dependent on oil price fluctuations and does not take into account the use of more expensive EALs, the use of seawater as the lubricating medium is obviously free of cost.

"While the environmental impact of oil leaking from sterntubes has been well documented, the commercial impact on the shipowners bottom line has not been addressed. This study intends to raise awareness of the commercial

disadvantages from the continued use of oil lubricated propeller shaft bearing systems, while offering a more cost-effective and more environmentally acceptable solution," said Carter.

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# Asia Maritime Pacific purchases 20 Cygnus ultrasonic hatch cover leak detectors

With the support of Cygnus Instruments Ltd, Mariso has successfully signed a purchase contract for 20 Cygnus Hatch Sure leak detectors with Asia Maritime Pacific (Shanghai).

Cygnus Instruments Ltd is an established and trusted manufacturer of ultrasonic inspection equipment across the marine industry and is considered as a leader in high quality ultrasonic solutions that are extremely durable and simple to use. The Cygnus Hatch Sure leak detector is a purpose-designed, robust and very lightweight system; as such it has become the market leader for ultrasonic hatch cover inspections and is the preferred choice of multi-national ship management companies across the globe who want to test covers quickly, accurately and cost effectively.

Mariso is one of Cygnus' long-standing Distributors and Service Centres for inspection equipment who provide a professional and first-class service around the globe. In April 2018, Mariso was able to secure a contract for 20 Cygnus Hatch Sure ultrasonic hatch cover leak detectors with Asia Maritime Pacific (Shanghai) Limited which belongs to Asia Maritime Pacific Group (AMP).

AMP owns and controls a significant fleet of over 40 vessels. Its vessels operate internationally, with a focus on China–West Africa, China–Australia and Atlantic dry bulk trades. The mini-MPP fleet operates on the intra-Asia and Australian dry bulk trades. The company is headquartered in Hong Kong, with offices in Shanghai, Beijing, Tokyo, London and Douala and Texas.

Ultrasonic hatch cover testing is the most accurate, repeatable and convenient method of testing hatch covers, doors, ventilators and access hatches and is the preferred method of inspection by P&I Clubs.



*Cygnus Hatch Sure in use.*

Cygnus Hatch Sure is Type Approved and accepted by all P&I Clubs and the Hatch Sure system comprises two main components: a powerful ultrasound transmitter with 19 x 40 KHz elements and a hand-held receiver.

The system is used by placing the transmitter within the ship's hold, conducting a quick and simple calibration and then closing down the covers. The transmitter is then switched on remotely and it will fill the hold with ultrasound; any

ultrasound that escapes will be detected by the operator, who will be on the deck walking around the periphery of the covers using the receiver. Using the sensitive microphone attached to the receiver, the system allows the operator to locate ultrasound leaking through any defective seams or joints; exact locations of potential costly leaks in heavy seas or rain are quickly and easily identified.

While ultrasonic hatch-cover testing has been available since the 1980s, Cygnus Hatch Sure has advanced the current technology with fully automatic open hatch calibration (OHC) to set the open hatch value (OHV). This ensures consistent results from hold to hold. The transmitter is powerful enough to saturate the largest cargo hold with ultrasound and the unit has variable output with six selectable power levels — allowing it to also be used in confined spaces, in holds that are full with cargo and for ancillary applications such as the testing of watertight doors.



*The Hatch Sure system.*

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# Autonomous discharge & transshipment

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*The Haaga during sea trials (photo: ESL Shipping).*



## Intelligent lifts raise bulk handling standards

Setting new safety and efficiency standards, MacGregor is poised to introduce the world's first autonomous discharging cranes, equipped with self-learning capabilities.

Approaching their final stages of construction, MacGregor will soon be able to test and showcase unique self-learning cranes on board commercial vessels. Developed as part of a joint project between MacGregor and ESL Shipping Oy, part of Aspo Plc, the world's first autonomous discharging bulk cranes will be

fitted on ESL's two new liquefied natural gas (LNG)-powered Handysize bulk carriers, *Viikki* and *Haaga*.

ESL knows MacGregor cranes very well and relies on their proven technology on a number of vessels. Its latest 25,532dwt bulkers are under construction at Jinling Shipyard in Nanjing, China and are on schedule for delivery later in the year. To serve each of their three holds, they feature three specially-developed MacGregor electro-hydraulic cranes, which have a safe working load of 30 tonnes with a grab and

an outreach of 30m. Like the majority of its vessels, once delivered the 160m bulkers will serve the Baltic region.

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



## A GREAT COLLABORATION

“Working with ESL on this development project has been a fantastic experience and a great collaboration opportunity,” says Ilpo Heikkilä, Vice President, Engineering and R&D, Cargo Handling at MacGregor. “By combining the expertise of a forward-thinking shipowner and operator with our knowledge in intelligent cargo handling, we are able to develop safer and more efficient solutions for unloading bulk cargoes and therefore reduce unnecessary waste in the value chain.

“Autonomous crane operation improves efficiency and safety, extends the service life of the crane and improves working conditions in port,” continues Heikkilä. “Discharging operations can be monitored and controlled from the bridge, or anywhere else where the system operator has a view of the crane position and operational control screen. This eliminates the need for personnel in hazardous operational areas.”

## MAXIMIZED EFFICIENCY

A number of features maximize efficiency. Each crane pre-calculates suggested routes using MacGregor’s command input shaping technology to optimize paths, ensure pendulum-free motion and minimize the total discharging time.

Using advanced sensor technology,

material distribution in the hold can be analysed to ensure optimal unloading. The crane’s topographic software module creates a map above each cargo hold to find optimal lifting points, further adding to the cranes’ efficiency.

The system also calculates which shore side hopper to use, depending on the hopper’s capacity.

The grab is controlled by an intelligent, self-learning algorithm that automatically adjusts to ensure that the bucket is filled to an optimum level and not overloaded. The auto-grip module readjusts lifting parameters when material properties change, automatically adjusting to switches between cargoes.

## COMMUNICATION IS KEY

The communication module between the cranes is the backbone of the system, sharing information such as current and upcoming positions and other important parameters.

It essentially mimics a crane driver’s desk and can be located on the ship’s bridge or anywhere the system operator has a view of the crane position and the topographic cargo map. In addition to supervising and monitoring the system in operation, it also remotely controls each crane via dual monitors.

## SAFETY ADVANCES SECURED

Safety advances are a key benefit of autonomous discharging bulk cranes. Speed and crane movement are continuously monitored to ensure cargo is moved without causing pendulation. However, if this does occur, it is automatically corrected by the cranes’ anti-pendulation system. Numerous sensors also compensate for a vessel’s change in list and trim during operations, so a stable discharge point is continuously maintained.

“These cranes are another leap forward in our cargo handling division,” notes Heikkilä. “They represent a significant change in what we can offer bulk handling operators and I am delighted that ESL will be the first to benefit.”

## SAFER, MORE EFFICIENT BULK HANDLING OPERATIONS

Autonomous discharging bulk cranes offer many key advantages including:

- ❖ driverless operation;
- ❖ automatic cargo unloading;
- ❖ efficient cargo discharge;
- ❖ better working conditions for system operators;
- ❖ smoother operations extend crane service life; and
- ❖ additional crane functions can be included separately, depending on the level of automation.



*The Viikki during sea trials (photo: ESL Shipping).*

## EMS-Tech Inc. enters the Korean self-unloading market

2018 marks the 30th anniversary for EMS-Tech Inc; the growth of the company over the years is attributed to the passion of its employees, customer loyalty, ability to support designs from the concept stage to full operation, and simply delivering innovative systems that work! As one of the leaders in the field of design and supply of gravity self-unloading systems, it is only fitting that 2018 marks another impressive milestone for EMS-Tech. With the June 2018 delivery of the self-unloading coal carrier for JK Maritime, built at Zhenjiang Shipyard in China, EMS-Tech officially entered the Korean market. The *JK Gunjang*, a 15,000dwt coastal coal carrier is rated for 1,500mtp (metric tonnes per hour) of coal, and is comprised of a 35-metre-long discharge boom conveyor, 36 patented EMS-Tech Feeder Gates, two transfer conveyors, and a 27-metre lift 'C' Loop elevating conveyor.

While self-unloaders are not new to Korea, the *JK Gunjang*, is only the four gravity self-unloader operating in Korea, and the first with an EMS-Tech system. The



*JK Gunjang*, is the most current, and efficient, self-unloader in the market, servicing the new Gunjang Energy Power Plant in Gunsan, South Korea. The self-unloader loads coal at the port of Gwangyang and unloads the coal in Gunsan. This 315 nautical mile journey is completed approximately every three days.

Since the delivery of the 15,000dwt self-unloader for JK Maritime, EMS-Tech has signed contracts with Daesun Shipbuilding, in Busan, South Korea, for the design and

supply of two 19,500dwt coastal coal carriers for Korea Shipping Corporation (KSC). These ships are scheduled for delivery in the first two months of 2020, when they will start their long-term employment with Korea Midland Power (KOMIPO) at the new Shin Seocheon Power Station.

EMS-Tech is pleased to be in the Korean market servicing the needs of new client, and looks forward to further developments in the years to come.

## In other news...

At the beginning of the 2018 shipping season, EMS-Tech Inc. was pleased to see the introduction of the newest River Class 650 to the Great Lakes. The *Algoma Innovator*, constructed at a Croatian shipyard, was part of the Algoma EQUINOX newbuild programme and fitted with an EMS-Tech self-unloading system. The 5,450mtp-rated system has been performing well, and is considered one of the best performing EQUINOX systems. EMS-Tech is also working with Yangzijiang Shipyard to complete the construction and delivery of the *Algoma Conveyor*. This vessel is expected to be delivered to Algoma



in January 2019.

In 2018, two new Panamax self-unloaders for Vulica Shipping were delivered by Hantong Shipyard in China. The introduction of these new self-unloaders was part of the Vulica fleet renewal programme aimed at addressing increased demand for aggregates resulting from US construction growth: the *Ireland* and *Donald M. James* are now unloading material at rates exceeding 4,500mtp. The self-unloading system, designed and supplied by EMS-Tech Inc., provides the seamless transfer of material from ship to shore with ease, and without impact to the surrounding environment. The unloading of the ship is completed by one crew member from the comfort of a control console located in the bridge. These gravity based self-unloading systems are comprised of two tunnel conveyors, EMS-Tech patented feeder gates, a 27-metre lift 'C' Loop elevator-conveyor, and a 79-metre-long discharge boom.



## Oldendorff Carriers signs transshipment deal in Vietnam



Oldendorff Carriers has signed an integrated coal transport and transshipment agreement for a new power station project to be built in the North of Vietnam at Nghi Son. The customer is a consortium between Marubeni Corp of Japan and Korea Electric Power Corporation (Kepco) named Nghi Son 2 Power Limited Liability Company (NS2PC).

The agreement is expected to include the transportation of about 100mt (million metric tonnes) of coal over 25 years. Oldendorff Carriers signed the 25-year agreement with NS2PC, and will do the ocean transportation of the coal, and the transshipment and delivery to Nghi Son.

Oldendorff, which also commenced a transshipment project at the Go Gia buoys in South Vietnam last year, will open an office in North Vietnam in order to perform the transshipment operations together with Vietnamese partners.

NS2PC started construction this year on 2 x 600MW power generation units on the coast of Nghi Son Province in North Vietnam. Both units will be completed in 2021 and are expected to consume about 4mt of coal per year. The coal will be mainly imported from five ports in Indonesia; Balikpapan anchorage, Samarinda anchorage, Adang Bay anchorage, Muara Jawa anchorage and Muara Berau anchorage, in Capesize bulk carriers.

Oldendorff Carriers intends to build two purpose built Transshipment Vessels (TSV) in China, with the first TSV being ready to transship and deliver coal cargoes in 2021. The TSVs will have a length of 145m, a beam of about 34m with about 27,000dwt on 8.5m draught. The TSVs will

be equipped with two heavy-duty cranes for self-loading from Capesize vessels at anchorage, and a gravity feed self-unloading system for discharging the coal at the NS2PC jetty. Each TSV will also be equipped with two payloaders for efficient discharging of the OGV. The coal will be unloaded from the Capesize by the TSVs cranes at a designated anchorage about 11nm from the NS2PC jetty. There will be about two Capesize deliveries per month and each vessel will have on board up to two grades of coal.

Oldendorff's is notable for its current annual volume of about 30mtpa of transshipment cargo. This new NS2PC project is a good example of a bespoke integrated logistics solution that gives substantial freight savings for customers. Insufficient port facilities or a shallow draught

does not mean customers have to use small ships with poor economics. Oldendorff offers a customized bulk transportation solution, from load port to designated jetty, including ocean transportation and transshipment, which is safe, cost-effective and environmentally friendly.

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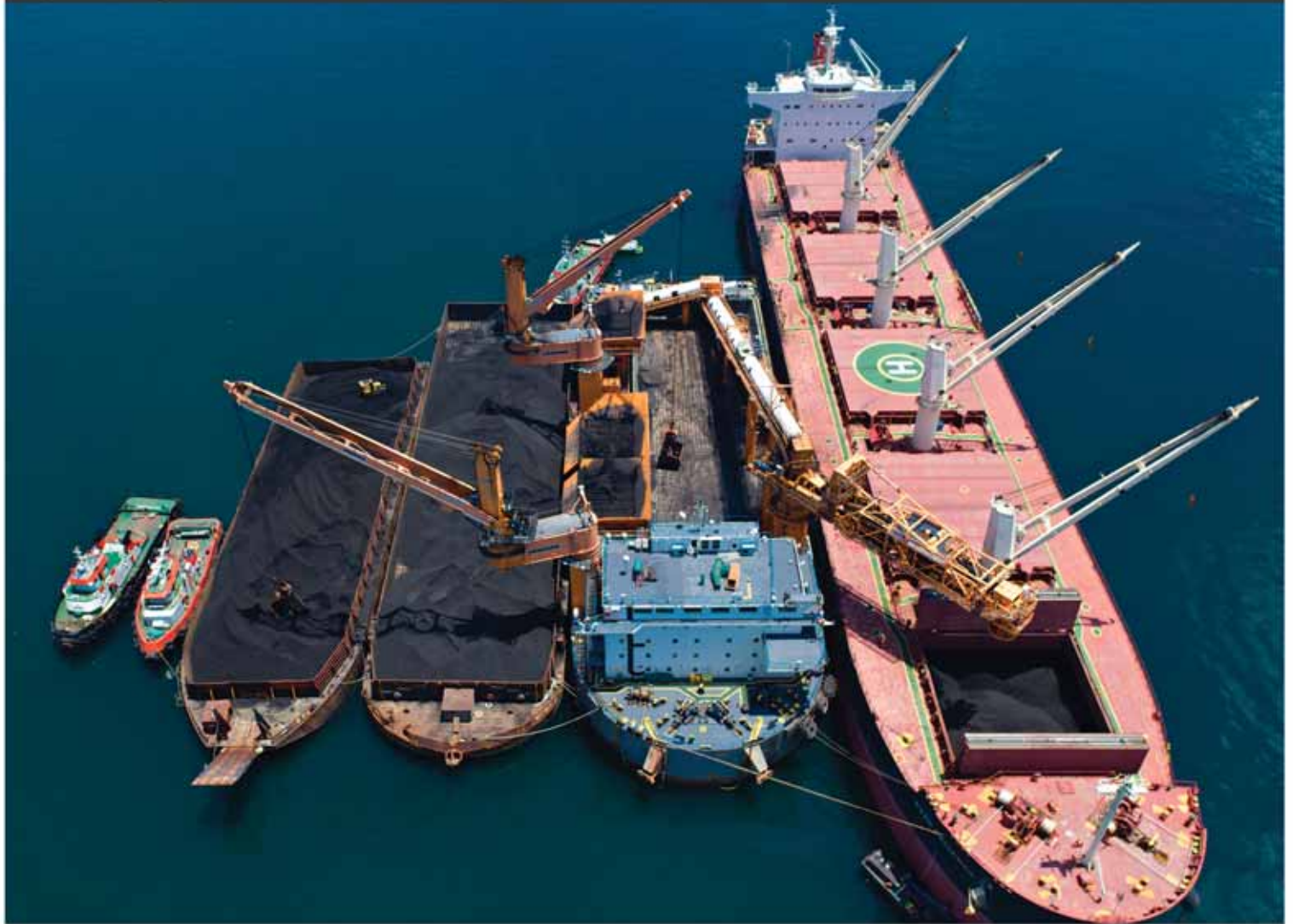
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[www.rocktree.sg](http://www.rocktree.sg)

# Rocktree expands with tugs & barges and vessel acquisitions

## EXPANDING THE CORE

Over the past decade of operations in Indonesia, Rocktree has earned its position as a pre-eminent provider of coal transshipment, storage and homogenous blending services to a top-tier customer base of international traders and best-in-class Indonesian coal mining companies. In the last six months, Rocktree has expanded its service offering through the purchase of a fleet of 14 tugs and barges. With the recent acquisition of two high-speed transshipment vessels with storage capacity, *Bulk Limpopo* and *Bulk Zambesi*, Rocktree has further differentiated itself in its ability to address the growing requirement for offshore storage to meet the logistics challenges of newly emerging commodity producing and consuming regions.



## TRANSFORMATIVE GROWTH

Rocktree started out with one transshipment vessel in 2009 — *Zeus* — designed to address the challenge of blending different qualities of coal offshore, without the need for a land-based port. The company added *Mara* in 2010, providing not only another asset able to offer homogenous blending, but also uniquely providing secured and covered storage at the anchorage. With the addition of *Apollo* in 2015, Rocktree solidified its position as a pre-eminent provider of value-added transshipment services, able to load not only gearless vessels but also the growing requirement for blending cargo onto geared vessels. Rocktree achieved record volume handled in 2017, in excess of 18 million tonnes, and the company is on target to achieve double digit growth in 2018.

With the recent acquisitions, Rocktree intends to expand its base of operations not only within Indonesia, but also to other commodity exporting countries. “We are seeing an increase in

ROCKTREE KPIs (SEP 2018)	
No. of transshipment vessels	5
No. of tug & barge sets	14
Volume handled (million tonnes)	140.5
Vessels loaded	1,959
Barges unloaded	18,987
Average transshipment stoppage	0.55%

interest from both producers and consumers for innovative solutions to complex logistical challenges,” observed Daniele Pratolongo, CEO of Rocktree. “With the continued economic development in South and South East Asia, we remain well-positioned to provide transshipment solutions to meet the infrastructure challenges of importing countries, such as Vietnam, Thailand, Myanmar and Bangladesh. In addition, we are also receiving enquiries from exporting countries and regions: Australia, Africa, and South America.”

ROCKTREE FLEET: TRANSSHIPMENT VESSELS					
	<i>Zeus</i>	<i>Mara</i>	<i>Apollo</i>	<i>Zambesi</i>	<i>Limpopo</i>
Handling capacity (million tonnes per annum)	8.5	12.0	8.5	14.4	14.4
Net Loading Rate (tonnes per day)	40,000	60,000	40,000	72,000	72,000
Blending & metal detection	Yes	Yes	Yes	Yes	Yes
Buffer storage (tonnes)	6,600	60,000	3,000	55,000	55,000

TUGS AND BARGES			
	Barges		Tugs
Number	10	4	14
Capacity/horsepower	7,500 tonnes	5,000 tonnes	2,000–2,060HP



## INVESTING IN ITS CLIENTS

Rocktree maintains a close dialogue with its clients and with its clients’ clients. Through this dialogue, the company identifies areas of improvement that are important to its customers. To meet the growing issue of metal contamination in the cargo that is loaded, Rocktree recently invested in a new metal separator system on each of its transshipment vessels, in addition to the metal detection system already onboard. The company has also installed online moisture and temperature analysers to monitor coal quality. To address the increase in geared vessels being loaded, Rocktree will be upgrading the shiploader on *Zeus* to match the one on *Apollo*, allowing both vessels to load Supramaxes. The company’s 24x7 CCTV monitoring system has been recently enhanced to include infrared cameras to detect cargo overheating. While Rocktree continues to develop tools to allow its customers to monitor the performance of their vessels remotely, Rocktree encourages end users to visit its operations, to see how the company approaches its business and to experience first-hand the Rocktree difference.

## Stellar performance from the 'Donnacona'

In June last year, CSL's newly converted transshipment shuttle vessel, *Donnacona*, arrived in Cape Preston, Western Australia, to begin a long-term contract to transship magnetite iron ore for customer CITIC.

Under the watch of Captains Ruslan Bykov and Matt Bedwell, the crew had a tall order to fill — to deliver a very ambitious minimum tonnage required by the customer.

After overcoming commissioning hiccoughs during the vessel's initial months of operation, *Donnacona* is now considerably exceeding her minimum capacity and is even breaking records.

The CSL team is constantly looking to improve the vessel's performance and the latest series of projects is aimed at enhancing efficiencies in deadweight cycles, bunkering and maintenance planning.

These projects include loading to tide, bunkering barges to reduce downtime and streamlining maintenance periods in line with port outflow shutdowns.

The recently completed loading to tide project, which involved consultations, risk assessments and a series of trials, increased deadweight from 21,000 tonnes to 23,000 tonnes per cycle and reduced the transshipment cycles from six to five.

The bunkering barge and maintenance planning projects are under way and being implemented by CSL superintendent, Jesse Pesch.

The efficiencies gained from these projects will be in place during the October maintenance shutdowns and are meant to increase *Donnacona's* availability.

To date, with only one of three projects in place, *Donnacona's* results have already been extremely positive. In July alone, the vessel transhipped a record 801,696 tonnes.



## CSL bids farewell to 'Iron Chieftain'

This past July, CSL sadly retired the *Iron Chieftain*, a 50,000dwt gravity self-unloading vessel, trading in CSL's Australian fleet.

The vessel sustained extensive internal and external damage as a result of a fire that broke out during unloading operations at Port Kembla, Australia, in June this year. CSL determined that the severe damage

caused by the fire had rendered the vessel irreparable. *Iron Chieftain* was a second home to many seafarers, some of whom had been working on the vessel as far back as when she was delivered to BHP Transport in 1993.

*Iron Chieftain* was the culmination of a project that began in 1988 when BHP Transport began investigating the potential

for a self-unloading vessel to carry coal from the Illawara coalfields in New South Wales to the Whyalla Steelworks in South Australia, and then load iron ore bound for Port Kembla on the return voyage.

By 2003, BHP had sold both its Port Kembla and Whyalla steelworks and decided to sell *Iron Chieftain*.

Michael Beck, CSL's Vice President, Special Projects, Marketing, was well known to the Melbourne-based BHP team who contacted him to see if CSL would be interested in purchasing the vessel. Together with David King and the Montreal team, CSL was able to close the sale very quickly.

*Iron Chieftain* joined the CSL fleet and continued the coal and iron ore trades between Port Kembla and Whyalla.

As CSL sadly bids farewell to *Iron Chieftain*, the company will remember her as one of CSL Australia's longstanding and reliable work horses.

CSL will also honour the valiant efforts to save *Iron Chieftain* by her crew, CSL's team on the ground in Australia, and the many organizations in Port Kembla who supported CSL and helped it conduct a Zero Harm operation.





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## Antwerp Towage celebrates tenth anniversary

Harbour towage specialist Antwerp Towage marked its tenth anniversary on 6 September with a ceremony at Waterfront Bar & Resto in Antwerp which was attended by many prominent industry representatives and port users.

Antwerp Towage NV was established in 2008 as a joint-venture between leading towage and salvage service providers Fairplay Towage and Multraship Towage & Salvage. It provides ship owners and operators with competitive harbour towage services at all river terminals and locks along the River Scheldt in the port of Antwerp, co-ordinating its state-of-the-art operations from dedicated offices at Tavernierkaai.

Antwerp Towage general manager Robert Van Hees says, "Starting a new venture in towage ten years ago was arguably a less daunting prospect than it



would be today. But it still required a leap of faith, and a commitment to investment in hardware and manpower, based on the conviction that we could provide an improved and more competitive service to the users of the Port of Antwerp than was available to them at that time.

"Ten years on, we believe we have achieved that objective, and established Antwerp Towage as a highly respected

brand in its specialist area of operation. The fact that we have been able to do that is due mainly to the hard work and dedication of our workforce, and to the loyalty of our customers, some of whom have been with us since the beginning.

"Harbour towage in Europe is a fiercely competitive sector, and we must expect clients to come and go and — in some cases — to come back again. That has certainly been the case over the past decade, and we expect it to continue in the future. The important thing is that users of the Port of Antwerp have continued access to competitive, quality harbour towage services.

"Ten years is a long time in shipping. We look forward to the next ten as we continue to give users of the Port of Antwerp the service they want and deserve."

## Port of Duluth-Superior supports nearly 8,000 jobs

The Port of Duluth-Superior generated \$1.4 billion in economic activity and supported 7,881 jobs last year. Handling 35 million short tons of cargo generated over \$504 million in total wages, salaries and purchases of goods and services in the regional economy. Cargo movement and vessel activity at the port also generated a total of nearly \$240 million in federal/state tax revenues.

The full report for the Port of Duluth-Superior spotlights local port activity gleaned from a much broader study released last month about the economic impacts of the entire Great Lakes St. Lawrence Seaway (GLSLS) system conducted by Martin Associates.

"The Port of Duluth-Superior anchors the westernmost point of this entire 2,340-mile System — a binational waterway that connects the heartland of North America to the global marketplace," said Duluth Seaway Port Authority Executive Director Deb DeLuca. "As the largest tonnage port on the Great Lakes, we have long known the key role this port plays in the economic vitality of the entire region. Not only does this study validate that message, it also provides relevant data to share with policymakers, investors, business leaders and residents alike

illustrating how indispensable our working waterfront is to job growth and economic sustainability in northeastern Minnesota and northwestern Wisconsin."

Some 35mt (million tonnes) of iron ore, coal, limestone, salt, cement, grain, steel, wind turbines, and heavy machinery move through the port each year, helping to keep businesses running in adjoining states and in communities along the US-Canadian border. Farmers, miners, steel producers, construction companies, food manufacturers, utility companies and street maintenance departments depend on this System to move raw materials and finished products to market.

Employment figures reported in this local study reflect direct jobs generated by moving marine cargo such as longshoremen, terminal employees, crane operators, steamship agents, vessel operators and crews, freight forwarders and stevedores plus railroad workers and truckers. Induced jobs are created when individuals spend their wages locally in grocery stores, restaurants, shopping centers and on home purchases. The study also captured indirect jobs created when marine-related businesses purchase goods and

services from office supply companies, maintenance and repair contractors, equipment suppliers and the like.

"The value of the Port of Duluth-Superior cannot be overstated," said Jason Serck, City of Superior economic development, planning and port director. "We do the heavy lifting here in the Twin Ports in terms of tonnage. When you look at the number of jobs in this area related to maritime commerce, it is clear that the working waterfront drives the economies of this entire region."

The nearly 20 privately owned bulk cargo docks in the Port of Duluth-Superior, plus one general cargo terminal operated by Duluth Cargo Connect, altogether account for the 35mt of cargo moved during the 2017 navigation season.

"Add in shipments of iron ore from Two Harbors (18.3m short tons) and Silver Bay (6.4m short tons), and it becomes readily apparent that the western end of the entire Great Lakes-Seaway system is a vital transportation link for the mines in northeastern Minnesota, for the farmers to the west, and for steelmakers and utilities to the east," said DeLuca. "This marine highway is our lifeline to Canada, Europe, the Baltic, North Africa and beyond."



## Project cargo news: Port of Blyth welcomes Responsive Engineering as new client

The Port of Blyth in the UK has welcomed another major engineering group to its offshore energy support base as the Reece Group's Responsive Engineering has set up a new fabrication facility at the port to cater for the growing offshore energy sector.

A new division at Responsive Engineering called Rapid Manufacturing Services, which will focus on the mobilization and demobilization of offshore vessels from the new workshop.

The Port of Blyth has been investing heavily to make its facility more attractive to those in the North East's subsea sector. Major investment is currently taking place on several sites around the estuary.

It is hoped one of those will create hundreds of jobs at the former Blyth Power Station site, as part of a £25m Energy Central initiative in partnership with Northumberland County Council.

On the arrival of Responsive Engineering, Martin Lawlor, Chief Executive at Port of Blyth, said: "We are delighted to welcome a company of the calibre of

Responsive Engineering to the Port of Blyth and look forward to a successful long-term relationship.

"The addition of Rapid Manufacturing Services' machining and specialist fabrication capability to the port's extensive supply chain further strengthens Blyth's position as one of the UK's leading offshore energy project and manufacturing support bases.

"It represents an excellent strategic fit for the port and reflects our ambitions moving forward as we prepare for significant growth in the offshore renewables, oil & gas and decommissioning sectors."

Reece Group Executive Chairman John Reece said: "Port of Blyth is one of the UK's fastest-growing ports with a reputation for innovation and excellence.

"We are looking forward to playing a part in its continued expansion as its ambitious plans aim to create jobs and prosperity for the regional economy."

The new division will be led by Responsive Engineering Director Graeme

Campbell. He said: "The launch of Rapid Manufacturing Services is an exciting next step for Responsive. Our base here in the Port of Blyth enables us to provide a faster, more bespoke response to our customers' needs, supported by the facilities and skilled workforce in the Armstrong Works.

"We can now offer an integrated supply chain solution for large, high-value sub-assemblies such as subsea wind turbine jackets, as well as supporting the port operator's tactical operational requirements.

"We also hope to develop closer strategic relationships with our customers already located here and greater collaboration with the increasing number of engineering companies at the port.

"The team has a wealth of experience in the energy sector, having worked for Responsive on major national contracts and they are eager to get involved with the innovative engineering taking place in this growing offshore energy hub. We aim to quickly grow our order book and generate new roles in a number of specialized areas."

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## Usiminas signs first third-party handling contract

In Brazil, Usiminas and Petrocoque have signed a contract that will see calcined petroleum coke loaded at the privately owned steel port, which is located at Cubatão, in São Paulo state. The forecast is for 30,000 tonnes monthly to be dispatched in two dedicated vessels. Most of Petrocoque's customers are primary aluminium producers.

For Usiminas, the contract is significant in that it is the first signed with an outside company as part of a move to make greater use of existing spare capacity within the port's infrastructure.

"We have a well equipped port that has all the necessary conditions in place to expand its activities. By opening up the possibility of handling general cargo, we will increase the unit's revenue generation, dilute port costs and also reduce costs for those companies next to Usina," says Usiminas' executive director of logistics, Leonardo Zenóbio.

Prior to Petrocoque using Usiminas Port, it dispatched consignments of pet coke via the Port of Imbituba, in Santa Catarina. The change has meant a cut in road journey from 740km to just 9km.

The change in handling policy at Usiminas began in 2016, when it began importing third party laminates. Thereafter, it commissioned a study and invited other companies to put forward proposals to either store products at the port or to use it to receive raw materials. The Petrocoque contract is the first to be signed under this new initiative, although others are in the pipeline. *Barry Cross*

## ADM expands Santos concession

In Brazil, ADM has expanded the grain terminal that it operates on the right bank of the Port of Santos by 26%. This was part of an eighth amendment to its original concession contract. However, the Ministry of Transport, Ports and Civil Aviation has confirmed that no new investment in the terminal is planned, other than in expanding the operating area.

The original terminal covered an area of 50,632m<sup>2</sup>, to which has now been added a further 13,610m<sup>2</sup>.

Significantly, the original concession awarded in August 1997 related only to the terminal's operating area. The latest addendum brings into the concession document all the access and perimeter roadways as well.

In 2017, ADM renewed its original concession until 2037. However, this was only granted on the understanding that new investment would be made in the terminal, which would also be extensively modernized. *BC*

## Record year for bulk traffic at Cartagena

The Spanish Mediterranean Port of Cartagena continues to post new records for dry bulk traffic, with the first two quarters of 2018 being the best ever.

In the first six months, it handled 3,211,849 tonnes, equivalent to an increase of 25.9% compared to the same period in 2017.

As for which commodities are doing best, agribulk performed particularly well. Cereals and flour grew by 76% to 1,183,674 tonnes, of which the majority was inbound from countries such as Ukraine, Russia, Argentina, Brazil and the US.

Port authority president, Joaquín Segado, noted that these historic figures weren't solely related to dry bulk in general, but to the agri-livestock and food sector in particular. He said that the growth could be put down to an increase in the port's competitiveness, in terms of both price and service, as well as in overall facilities and in product inspection.

Cartagena has also found success in wood, cork and iron scrap. The first two, for example, showed a five-fold increase from 13,131 tonnes to 64,172 tonnes in terms of year-on-year growth.

In total, 49,500 tonnes of iron scrap were also generated in the first six months, compared to just 180 tonnes in the corresponding 2017 period. Segado explained the growth on increased consumption by countries such as Turkey, where construction is booming. *BC*



# Hamburg-Le Havre

ports post positive results



Barry Cross

In the vast geographical expanse dividing Hamburg from Le Havre, the main port players in the dry bulk market are mostly posting upbeat traffic results, despite poor harvests in recent years having negatively hit grain volumes in particular.

In 2017, for example, HAROPA, which operates the ports of Paris, Rouen and Le Havre, registered a slight downturn in its dry bulk traffic, which dropped 4.5% to 11.14mt (million tonnes) when compared to 2016. This was due to the aforementioned decline in cereals traffic brought about by a poor harvest in France in the summer of 2016.

By the end of December 2017, the Port of Rouen had handled 5.5mt of export grain, compared to 6.7mt in 2016, which was an 18% overall decrease. Nevertheless, it still remains the leading port for

export grain in Western Europe. On average, grain worth more than \$100 million is shipped each month from its silos.

Despite the downturn in cereals, in other commodities, dry bulk trade rose strongly, increasing by 14.7%, thanks to a surge in coal, aggregates and oil products.

As for the current year, HAROPA handled first half dry bulk traffic of 6.59mt, an increase of 23%. Cereals amounted to 4.13mt, a rise of 56% rise. For their part, aggregates totalled 892,000 tonnes compared to 576,000 tonnes last year, which was growth of 54.8%. In contrast, coal went down by 82.5% to 120,000 tonnes.

Looking at the traffic picture over time, HAROPA facilities generate, on average, anything between 11 and 12mt of dry bulk annually, mainly in Rouen, which generally

accounts for around 9mt. The company predicts that end-of-year traffic for 2018 will fall within these parameters, too.

There have been some interesting developments in terms of individual terminal traffic, especially with the ending of European sugar quotas as of 1 October 2017. The Robust terminal (Sénalia), for example, had handled by the end of February this year, 117,267 tonnes of sugar, in bags, bulk and containers. Terminal throughput continues to grow: 10,923 tonnes in October 2017; 26,206 tonnes in November; 20,479 tonnes in December; 18,783 tonnes in January, and 40,876 tonnes in February 2018.

In terms of 'captive' traffic, HAROPA concedes that the coal-fired power station at Le Havre means coal has to be off-loaded there. Trades related to the Building



*Loading grain at the Port of Rouen.*

and Public Works sector and some flows of grain from the surrounding area also, logically, pass through the company's ports. However, other commodities, including fertilizer, cereals and agri-food products from deep within the port's hinterland potentially could be, and are, shipped around.

However, Rouen, in particular, remains popular, located as it is at the start of the Seine estuary, significantly inland from the coast, giving it both an economic and an ecological advantage. In addition, its terminals are the closest maritime installations to Paris, thus making it the effective port of the capital, along with Le Havre.

Rouen has an effective hinterland encompassing 25 million people, all within a radius of 200km, making it the second largest European market, responsible for one-third of GDP. The population is also the densest of that of any other French ports.

HAROPA ports can offer the lowest transport costs to or from the producing/consumer areas; while the draft of the River Seine makes it highly suitable to barge shipments up and down from either Rouen or Le Havre. The company additionally has a storage capacity of 1.3mt for foodstuff products as well as a high loading productivity, in the region of 100,000 tonnes a day for cereals. Finally, its

bulk terminals are able to offer 'tailor-made' operations, if required, or even handle very high volumes.

River traffic from Rouen is the most important in France. Each year, around 5mt of cargo is sent up and down the River Seine, most of which is dry bulk. Last year's figure of 4.5mt was 10% down on the previous year's figure of 5mt, mainly accounted for by the poor grain harvest in 2016-2017. Commodities carried on the river to and from the Ile-de-France region include cereals, aggregates, materials and worksite rubble, bio-mass (black pellets) and containers.

Given the environmental impact of too much road traffic, HAROPA is pursuing



*Manuport, Le Havre.*

VIGAN NIV 600 pneumatic ship-unloader head, installed at the Port of Dunkerque (France) in 2016.



programmes to shift dry bulk to both rail and inland waterway.

In terms of rail, the 'Seine Corridor Railway Freight' (FFAS) initiative has begun to provide some encouraging first results, with the launch of reliable rail shuttles on long distance services. One example is the new rail shuttle to Switzerland in partnership with the port of Marseille-Fos, along with operator Naviland Cargo.

As for waterways, the aim is to increase river traffic's share to 20% by 2030, which will involve moving 38mt. In this respect, Bollore Logistics launched a weekly river shuttle between Le Havre and Bonneuil via Gennevilliers in early 2018, with the help of HAROPA.

Also to help promote barge traffic, a 'cat flap' is going to be built in the breakwater at Le Havre to provide improved direct river access to Port 2000. Openings will be made in the Southern breakwater of the historic port and in the Northern breakwater of Port 2000. This will facilitate direct access to Port 2000 for river barges, with investment to reach €125 million.

In direct contrast to the downturn experienced by HAROPA, the French Port of Dunkerque reported dry bulk traffic amounting to 22mt in 2016, which increased to 24.5mt in 2017, which is growth of 11%.

Isabelle Devinne, commercial director at the port, points out that Dunkerque is very much a specialist dry bulk handling installation. This can be seen, she adds, from

looking at total traffic last year, which amounted to 50.4mt, with dry bulk accounting for 48% overall.

"It is mainly major bulks that have done well, with a notable increase in the consumption of ArcelorMittal," she says.

Smaller volume dry bulks are more or less holding their own, although sugar stands out, increasing by 80,000 tonnes between 2016 and 2017. In the same period, Dunkerque Multibulk Terminal also boosted its exports by 100,000 tonnes.

Figures relating to the first five months of the current year show that Dunkerque has handled in the region of 11.5mt of dry bulk. This suggests that by December 31st, it will have handled around 27.3mt, which is the equivalent of growth in the order of 10%.

"In recent months, Dunkerque has seen the arrival of new commodities, such as wood chips or pellets. At the same time, other flows such as import fertilizer and soda ash have increased significantly," she says.

For this year and in 2019, the port could also see developments linked to import gypsum for use in local construction material and also imports of raw material for phosphate production for ECOFOS, which set up very recently in the port. These are also expected to generate export flows.

When quizzed as to what part of the total tonnage would naturally come to Dunkerque anyway, Devinne says that this

very much depends on the type of traffic. Of the main commodities that the port handles, such as those processed at the Arcelor Mittal plant, these are very much linked to local industry, so are effectively "captive", since Dunkerque is the logical port of entry.

However, for other bulks, things are quite different.

In terms of commodities used as part of industrial processes, for example soda ash or feldspar, Dunkerque has been handling these for years, so they are viewed as long-term traffic.

"Customers are looking for reliable solutions, fluidity and know-how. Once they find it, they do not easily change their logistics chains," she says.

Nevertheless, there are also more 'opportunistic markets' for those products that do not require special treatment, or special facilities. In respect of these, there is more volatility, because the competition between ports is more aggressive.

As to how Dunkerque is able to attract these more marginal consignments, Devinne points out that the port has courted this sector for many years. Over time, it has been able to build up facilities that do, indeed, make it an attractive option for businesses, with specialized indoor warehousing, as well as open-air stockpiles for significant tonnages.

"The port is now in a position to handle all types of dry bulk commodities, even the most sensitive. We have a range of



*Handling steel coils at the Port of Antwerp  
(© Gemeentelijk Havenbedrijf Antwerpen).*

specialist handlers and stockists that offer tailored services to customers,” she says.

In addition, the entire port and its dry bulk handling areas are accessible either by rail or by river. Furthermore, access to the port is very easy for even the largest of vessels, since the eastern lock can accept a maximum size of 120,000 tonnes.

“Of particular interest to importers is the fact that we do have available good barge and rail links. Also in terms of export grain, these modes generate a lot of traffic,” she says.

The Port of Antwerp is one of the major power houses for dry bulk handling in the Hamburg–Le Havre range.

The year 2017 started with significant increases across the board, with initial forecasts suggesting an end-of-year figure of 13.7mt would be handled. However, in the event, the final figure amounted to a still credible 12.2mt.

Business development manager Wim Dillen notes that this was still a significant increase over 2016’s 12.6mt. Explaining traffic for the year, he points to a 600,000-tonne drop in coal traffic compared to the previous year, and that drop manifested itself mainly in the second half of 2017.

“In the first five months of this year, we handled 5.4mt, which compares to 5.2mt in the same period in 2017. That’s an increase of 3.8%,” he notes.

“It’s very hard to say what total traffic will be for 2018, because the current increased protectionism in the world — such as US import duties for steel and aluminium and possible retaliatory measures - may have an impact. But we do expect to handle approximately the same volume as last year.”

Of those commodities that are doing well, he emphasizes a rise in sugar tonnage, which was due to the lifting of the EU quota-system in September 2017. Building materials are also up by 70%, and fertilizer by 20%.

When asked what percentage of current dry bulk traffic was effectively ‘captive’ to the Port of Antwerp, he estimated it was in the region of 80%, with just 20% potentially up for grabs.

“Our proximity to the main industrial and consumer areas of EU, is one of the main reasons why we are able to attract the dry bulk traffic that we do,” he comments. “Thanks to our inland location, we have a distinct advantage of being at

least 90km closer than any other port to the heart of Europe. And when you take into account terrestrial logistic costs, which are more important than maritime logistic costs in a supply chain, it is logical to choose Antwerp.”

Environmental concerns now mean that many ports are seriously looking at all-electric operation wherever this is possible. Dillen says that this has to be very much seen as the way forward in the Port of Antwerp, where all operators have subscribed to the port’s sustainability programme.

“At the same time, we are very actively promoting a modal shift in favour of barge and rail, and even created Railport NV, a subsidiary of the Port of Antwerp, which will optimize transport in the last mile in our port in order to increase the role of rail-traffic, which we feel is currently underused,” he says.

But, he stresses that the port authority is not having to apply pressure per se on operators within the port to become more environmentally friendly.

“It is my strong belief that the operators are themselves very much focusing on ‘green’ solutions and willing to decrease the environmental impact of their operations. Basically, all of them have done tremendous things to improve their ecological footprint in the past three years.”

North Sea Port is a 60km long cross-border port that encompasses Vlissingen and Borsele over Terneuzen, in the Netherlands, as well as stretching 32 kilometres inland to include the Flemish/Belgian port of Ghent. As of 1 January 2018, it effectively brought together Dutch Zeeland Seaports (Vlissingen and Terneuzen) and the Flemish Ghent Port Company under a single umbrella.

In 2017, the Zeeland port area generated seaborne cargo traffic of 34.1mt, mostly due to a strong second half performance. However, the year-end figure was 2.7% more than in 2016, not to mention being the third best result ever.

Inland waterway traffic also did well, registering 33.5mt, which was the best result ever.

Total traffic was therefore a record 67.6mt. Dry bulk traffic performed particularly well.

In the first two quarters of the current year, traffic is up in virtually every sector of the port, with dry bulk again doing well, along with liquid bulk and general cargo. Overall, dry bulk remains the most important sector of port traffic, accounting for 16.1mt, up almost 5%. This is mainly the result of a strong construction market

(sand, gravel and building materials), although coal traffic, mainly used by the processing industry, remains stable, despite having declined in other regional ports.

The port also reports an increase in inland waterway traffic, which increased by 9% to almost 31mt for the half year.

Nevertheless, despite the excellent start to the year, the port is not expecting the third and fourth quarters to be as good as the first two. This is because business in the second half of 2017 was far better than the first.

Commodities handled by North Sea Port now include iron ore, coal, foodstuffs, grains and fertilizer, to which can be added general cargo, such as steel, paper, wood, fruit and project cargo. In most years, dry bulk is 47% of seaborne cargo totals.

Last year, following good first half figures, the Port of Hamburg predicted it would handle around 31mt of dry bulk and that proved to be almost the exact figure for traffic that materialized.

Axel Mattern, CEO of Port of Hamburg Marketing, notes that three commodities invariably determine overall dry bulk traffic volumes: grain and oil seeds, coal and iron ore. The first is very much dependent on the weather and the world market prices. In 2017, this was particularly beneficial to agriculture and generated large amounts of export grain traffic.

"In contrast, the weather in 2018 has been particularly dry, with summer starting almost in April. Because it has been very dry, we don't think the harvest will be so good this year," Mattern told DCI. "Because of that, at the moment, we are unable to forecast what our end-of-year dry bulk figure will be, because much depends on grain export levels and our specialists think these will fall."

Similarly, 2017 was a record year for coal traffic, with 7.8mt handled. The port believes that similar levels will be reported for 2018, which will also be the case with overall iron ore traffic, although there is also a possibility that these commodities might decline slightly.

For the first quarter of this year, Hamburg registered dry bulk traffic of 7.2mt, compared to 8.7mt in the corresponding 2017 period. This is put down to a "market-related decline in grab cargo and agribulk".

According to the port, any increase in the dry bulk market tends to come from organic growth rather than terminal operators moving into new markets. Indeed, the spokesperson points out that the majority of commodities handled by the port are used by local industry, so are



Moving coal cargoes by barge at the Port of Hamburg (©HHM/Dietmar Hasenpusch).

effectively "captive" to Hamburg. In fact, oil seeds, coal and iron ore is often tied to terminals through shares and contracts, so won't go to other ports. However, in the case of grain, the situation is more complicated, since volumes are so weather dependent, which means that they are not "tied" to a particular terminal, given that producers in Germany cannot guarantee flows if not enough grain is generated in any particular year.

Hamburg's biggest advantage in attracting dry bulk traffic, says the spokesperson, is its inland location, more than 100km from the coast. It also has excellent rail and inland waterway connections, which are vital to the onward movement of dry bulk.

"We are by far the biggest rail port in Europe," says Axel Mattern. "All our terminals are rail-connected. In addition, the port authority is doing a lot to convince shippers to move consignments to both rail and inland waterways, where possible. And we are having some success." Hamburg port authority has launched a new web portal called Elba aimed specifically at promoting more inland waterway use by making it much easier to use. The so-called Intelligent Transport System (ITS) strategy aims to optimize data interchange for inland waterway vessel services. Traffic data, such as schedule and cargo data for inland waterway craft, terminal/lock/bridge availability, Elbe water levels and other current traffic data from the Harbourmaster's Office and the

Nautical Centre are all expected to enter the system.

"Our aim is to optimize availability of data for inland waterway shipping in the Port of Hamburg, to enhance the reliability and calculability of transport processes, and to boost the utilization and efficiency of transport infrastructure," explains Saskia Zippel, who is responsible at HPA for its Inland Waterway Shipping Strategy.

It is hoped the ITS will reduce costs for users and improve traffic safety for inland waterway vessels. Data interchange between all players in the transport chain will be paperless, simplified and accelerated. Among other advantages, this will enable inland waterway skippers and terminals to react more flexibly to non-scheduled delays or changes. Connecting this system to the smartPORT logistics (SPL) project will make the entire transport chain more transparent and efficient, with inland waterway shipping incorporated too. [DCI](#)

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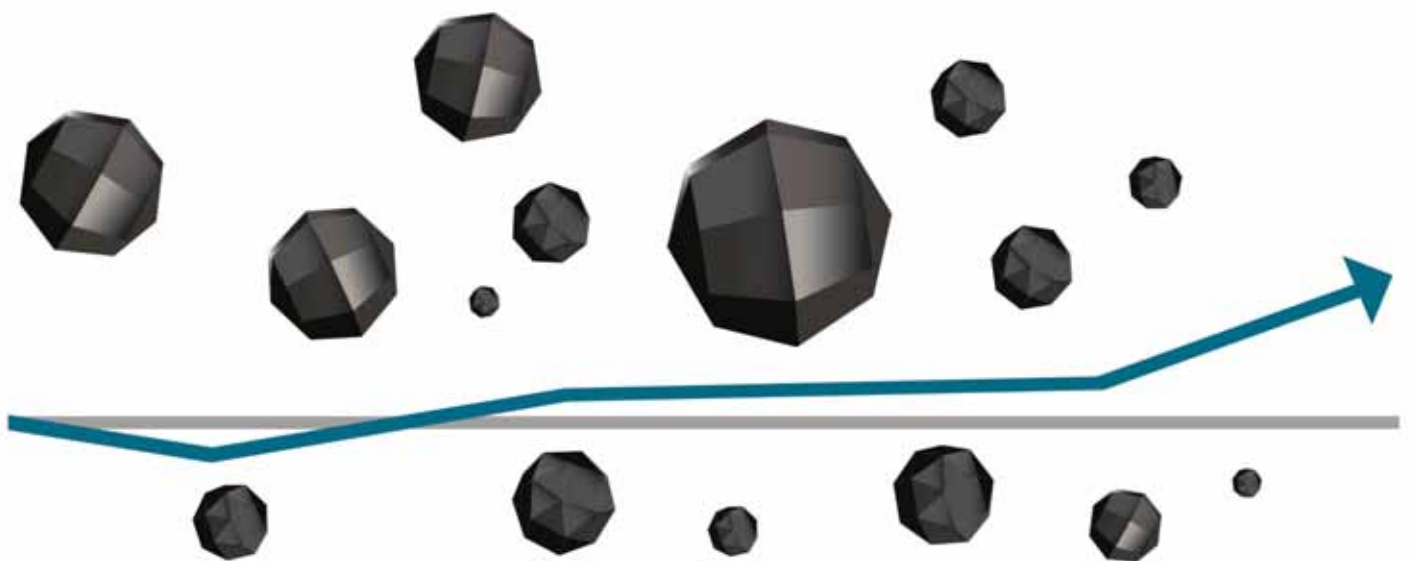
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# Mantsinen extends its production capacity

Mantsinen Group Ltd Oy is extending its production capacity at Rauma in Finland. The company's Material Handling Machinery unit is setting up a new assembly unit in September 2018, in premises which have been leased from Euroports Rauma Oy. This move is part of the company's long-term growth strategy, which in particular is aimed at enhancing the delivery logistics of its exports.

## GROWTH OVER TIME THROUGH DEDICATED WORK

Mantsinen has significantly extended its global distribution network over the last few years, and the results of this hard work can be seen in the volume of orders being received and in the positive momentum in the global investment business. The extension of production facilities allows it to considerably increase its production volumes. "The hydraulic port crane we developed is growing in popularity in markets around the world. Entering into new market areas places increasing demands upon our delivery chain, and so it's a natural step for us to start assembling our machines near the sea because these days we are far more often shipping assembled equipment by sea," says Mia Mantsinen, the company's Managing Director.

## ONE FOOT IN THE FOREST, ONE FOOT ON THE SEA SHORE

Mantsinen has been known for over 55 years as a developer of terminal logistics for the forestry industry. The company is also the wood yard operator for Metsä Fibre's Äänekoski and Rauma pulp mills. In the 2000s, Mantsinen added a second business unit alongside the service unit. Employing over 150 members of staff, the machinery unit's product portfolio ranges from heavy hydraulic material handling machinery to port cranes, together with associated attachments and life-cycle services.

"We are keeping our main office and product development functions in Liperi, eastern Finland, although this expansion means that other functions could also partially be based in Rauma. However, at the initial phase we are going to focus on the assembly of our products and shipping," Mia Mantsinen continues.

The company has also started a development project at its Liperi production facilities and this will gather speed in 2019 and 2020. Recruitment is part of the daily work at Mantsinen: "We have recruited more than 30 people in Liperi during the past three years, but we plan to proceed more gradually in Rauma," adds Mia Mantsinen.

## WORKING WITH PARTNERS

Both Euroports Rauma and the Port of Rauma, which is responsible for managing the port area, have been Mantsinen's partners for a long time. "Mantsinen Group was already familiar to us as a provider of cranes. We are happy to hear that our collaboration is about to become even deeper, because Mantsinen chose Rauma and Euroports' industrial facilities as the base for their extended operations," says Juha Rehmonen, Account Manager at Euroports Rauma. The Managing Director of the Port of Rauma, Hannu Asumalahti, is likewise pleased to hear that Mantsinen chose Rauma. "I believe that the Port of Rauma can offer good logistics premises and room to produce and deliver cranes around the world."

## FIRST DELIVERIES TO URUGUAY

Mia Mantsinen explains that the first delivery from the new premises is destined for Uruguay, as the company is providing material handling machinery for raw materials logistics to the Montes del Plata pulp mill within the next 12 months. The delivery consists of 12 hydraulic cranes that help ensure that the raw materials logistics for the pulp mill, which is able to produce 1.4 million tonnes of pulp, run well and smoothly.

*The Port of Rauma.*



## Powered by SAMSON: the new-generation STORMAJOR®

The new, updated design promises to improve handling and stability in the loading and reception of all kinds of bulk materials. The new-generation STORMAJOR® from SAMSON Materials Handling Ltd. is available in three models:

- ❖ STORMAJOR® 380 Series: for materials with a bulk density  $\leq 1 \text{ t/m}^3$ , such as cereals, fertilizer or alternative fuels;
- ❖ STORMAJOR® 450 Series: for materials with bulk densities from 0.9 to  $1.6 \text{ t/m}^3$ , such as additives, light minerals or fertilizer; and
- ❖ STORMAJOR® 800 Series: for materials with bulk densities from 1.5 to  $2.1 \text{ t/m}^3$ , such as heavier minerals or ores, sand and gravel.

The new STORMAJOR® design is the result of decades of experience with the previous generations of these machines from SAMSON. It combines a mobile truck unloader with a moveable boom. This versatile unit allows the operators of ports, goods depots and stockpiles to receive bulk materials directly from trucks, front-end loaders or other loading equipment and to load them into vessels or railway wagons. As the new STORMAJOR® is fully mobile, it is also ideal for the efficient stockpiling of bulk materials.

In developing the machine, the engineers considered its suitability for dealing with the wide range of requirements in ports and terminals, as well as making it reliable and easy to maintain. The boom is attached below its centre of rotation, so that fines do not collect in the bottom of the machine. The feed section of the main chute is completely decoupled from the conveying sections, which means that if necessary, bulk materials with particularly poor flow properties can be actively shaken to make the process more efficient. The standard angle of the transfer chute walls is already an effective measure to reduce the danger

**THE NEW STORMAJOR®  
POWERED BY SAMSON**



*The new-generation STORMAJOR® from SAMSON Materials Handling Ltd. (photo: SAMSON)*

of bridging when handling different materials which do not flow well.

Each version of the STORMAJOR® has two travel and power options. A wheel-mounted STORMAJOR® will be towed, or a tracked machine will have its own drive. When moving the machine fully loaded, it can be equipped with additional outrigger support.

The new STORMAJOR® is offered with a choice of engine and drives. For example, the conveying sections can be either electrically or hydraulically driven. The self-driven versions can be equipped with diesel generator sets with various emission standards, up to TIR5. The main drive concept depends on off-site power supply or pumps and generators driven by the diesel generator sets. The "Power twin" sets new standards here with an additional distribution gear directly flanged on to the diesel generator set.

Thanks to a large range of extras, each STORMAJOR® can be further tailored to the specific requirements of the application. Examples of these enhancing features are additional transfer chute systems, various lining options for chutes and conveyor, dedusting solutions, additional enclosures for the conveying sections,

operation and maintenance platforms, operator cabins and lighting packages.

### ABOUT THE AUMUND GROUP

The AUMUND Group is active worldwide. The conveying and storage specialist has special expertise at its disposal when dealing with bulk materials. With their high degree of individuality, both its technically sophisticated as well as innovative products have contributed to the AUMUND Group today being a market leader in many areas of conveying and storage technology.

The manufacturing companies AUMUND Fördertechnik GmbH (Rheinberg, Germany), SCHADE Lagertechnik GmbH (Gelsenkirchen, Germany), SAMSON Materials Handling Ltd. (Ely, England), as well as AUMUND Group Field Service GmbH and AUMUND Logistic GmbH (Rheinberg, Germany) are consolidated under the umbrella of the AUMUND Group. The global conveying and storage technology business is spearheaded through a total of 15 locations in Asia, Europe, North and South America and a total of five warehouses in Germany, USA, Brazil, Hong Kong and Saudi Arabia.

## Recycling history in Colne Valley since 1876: Schofield Metal Recyclers combines tradition and modernity

The Schofield family's scrap yard is unique in Great Britain, not only because of its idyllic location on a hill near Huddersfield/Yorkshire but also the material and how it is processed here deserve a closer look. Not only do the green jibs of the two SENNEBOGEN material handlers fit perfectly into the green hilly landscape, but also the heaps of very fine broken castings piled up several metres high seem to have been part of the landscape here for decades.

The sixth generation of the family business Schofield of Huddersfield, England, is closely rooted in the subject of recycling. The history even goes back to the early 19th century, long before everyone was talking about recycling and the use of raw materials, the founder James Schofield had established a family tradition at the site with the recycling of waste from the wool industry. More than 140 years later, Schofield Metal Recyclers is still worth a visit, after all, Managing Director Mark Schofield focuses on "highest quality instead of mass production". That is why the company's machine and vehicle fleet is always at the cutting edge of technology. In mid-2018, sales and service partner Hassell was able to deliver a SENNEBOGEN 825 E and 830 E each — one more reason to take a closer look at the scrap yard.

### 'HIGHEST QUALITY INSTEAD OF MASS PRODUCTION'

For an outsider, the mountains of scrap metal seem to almost belong to the landscape of the hills of the Colne Valley. Located between Leeds/Bradford and Oldham/Manchester, material is collected and purchased within a 100-mile radius. Mark Schofield and his ancestors have specialized in the processing of high-quality casting materials. "We can break cast elements weighing up to 15 tonnes here on site with our drop balls, which requires not only skill, but also extremely robust and powerful machines," explains Schofield. For 20 years, he has relied on the green SENNEBOGEN material handlers made in Germany.

### MODERN MATERIAL HANDLERS ARE FASTER, MORE EFFICIENT AND ABOVE ALL SAFER

Equipped with the modern Maxcab comfort cab, which can be elevated by 2.70m, the drivers not only have an excellent view of their working environ-



*The mountains of scrap metal near Huddersfield continue to grow in height. Thanks to the 17m reach of the new SENNEBOGEN 830 E, the material can be piled up even better in future.*



*Quality pays off. Managing Director Mark Schofield is convinced of this. This applies to its high-quality recycled materials as well as to the modern machinery of the SENNEBOGEN 825 E and 830 E material handlers.*

ment, but also work reliably and are protected in all weathers. The SENNEBOGEN 830 E also has a powerful 164kW diesel engine and a maximum range of 17m. This allows them to stack up even the heaviest of materials safely to maximum height. The high reliability of the machine and all components, the good stability and finally simple maintenance are features that are particularly appreciated here on SENNEBOGEN machines. Added to this is the industry knowledge and good support from the sales and service partner Hassell from Stoke-on-Trent.

"While a lot used to be done with rope-operated cranes, today modern material handlers are faster, more efficient and

above all safer," explains Schofield. Only through the continuous modernization of space and equipment has the company been able to successfully assert itself on the market over the decades with a focus on the highest quality in processes and materials.

Until about 20 years ago the scrap market for Schofield's, both buyers and sellers, was predominantly in the UK; today up to 60% of buyers are from abroad, although the iron foundries in the region also remain indispensable customers, according to Schofield. For this reason, the stock on the site can never be large enough to safely fulfill any order, no matter how large.

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- 1no 4/600mm diameter KMH screw transfer feeder system
- 1no 300m x 1.050m land transfer conveyor system
- 1no 4/600mm diameter KMH screw transfer feeder system
- 1no 90m x 1.050m land transfer conveyor system
- 1no 40.5m x 1.050m Stock pile conveyor system, 320 degree slew
- 1no mainland MCC Siemens control system housed in 14mx3m Modular building
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- 1no Blake 20,000L diesel tank Modular; hook lift type tank and pump system

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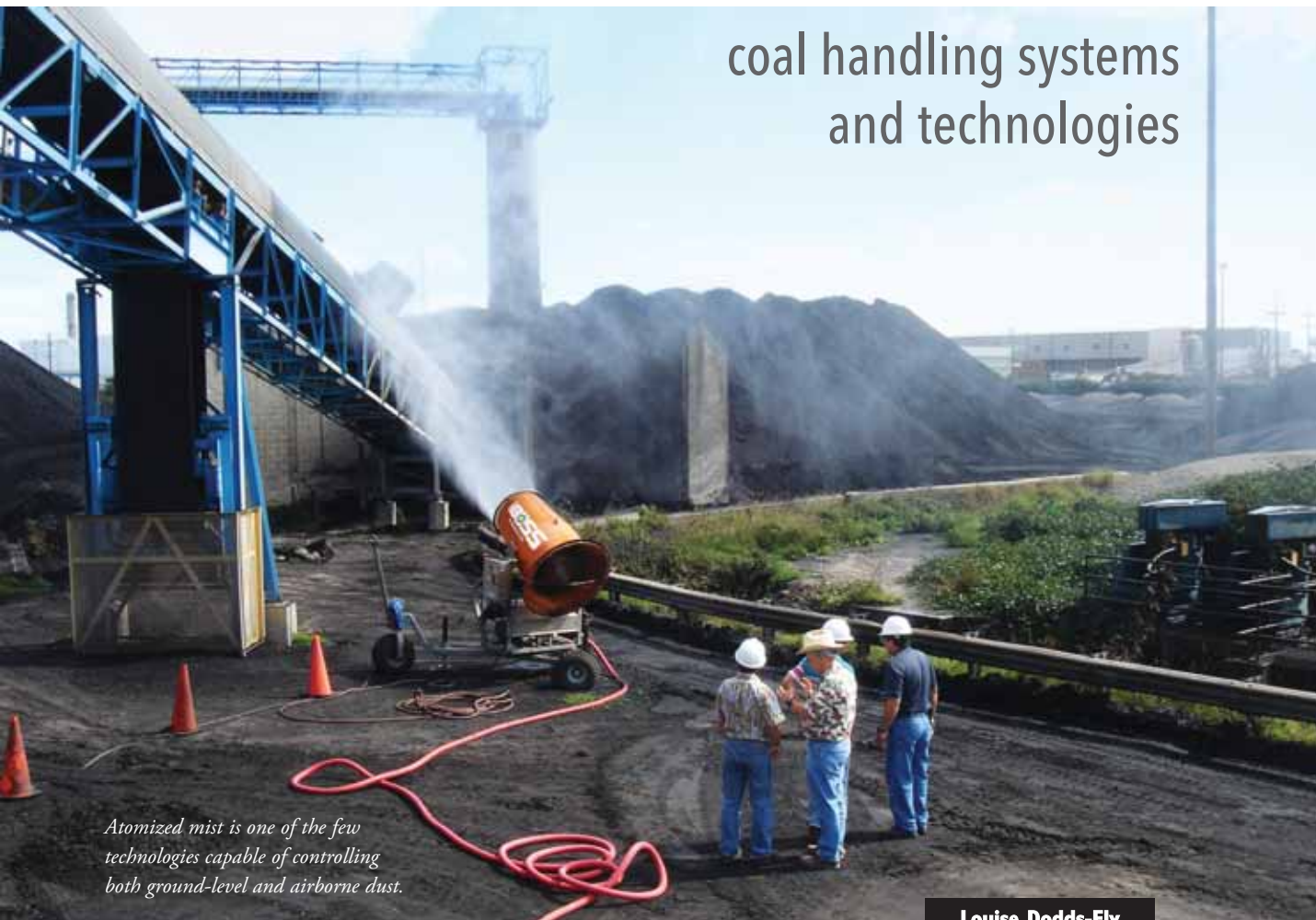


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# At the coal face

## coal handling systems and technologies



*Atomized mist is one of the few technologies capable of controlling both ground-level and airborne dust.*

Louise Dodds-Ely

## Innovative dust control solutions to meet coal regulations

In December of 2014, the Chicago City Council passed a regulation that requires coal storage companies operating within the city limits to completely enclose operations and allow zero fugitive dust emissions to travel outside of the site boundary, writes Mike Lewis, *Dust Management Specialist at BossTek*. Meant to push outdoor coal storage and transfer station operators out of the Chicago area, the regulation came in response to complaints and civil lawsuits filed by the local community against many of the companies that store and handle coal in South Chicago, citing air quality violations and health concerns. This has inspired other municipalities around the country that are experiencing similar problems to closely monitor the issue and consider similar legislation.

The effects of the regulations can be seen in cases such as the forced closure of

a mid-sized Chicago area coal storage facility owned by Beemsterboer Slag Corp. Also in South Chicago, the Calumet Transload Facility was fined \$50,000 for air quality and other violations involving the handling of 12,000 tons (10,886 metric tonnes) of coal products at the site, restricting the company to only handling road salt. However, rather than buckling to pressure, some of the larger operators, such as KCBX Terminals Company — a subsidiary of Koch Industries — have instead planned to erect massive enclosures at great expense around bulk handling and storage operations to comply with the new air quality standards.

### DUST CONTROL STANDARDS

Regardless of the specific limits in each municipality, measurable dust emissions are required by federal law to be controlled and are generally monitored at the state

level. The most common way to control dust from outdoor storage piles is through the use of large amounts of water. In an attempt to mitigate dust, many sites have installed high-pressure sprinkler systems that use hundreds of gallons of water per minute, which unfortunately has only a marginal effect on ground-level dust. It also results in high water costs, material saturation and runoff. This leaves organizations facing further regulations regarding wastewater<sup>[1]</sup> and introduces an undesirable increase in moisture content, which can have a serious effect on the overall cost, performance and stack emissions from coal.

According to a study conducted by the

[1] Staff. "What is Nonpoint Source Pollution?", Environmental Protection Agency, Washington, D.C., August, 27, 2012

<http://water.epa.gov/polwaste/nps/whatis.cfm>

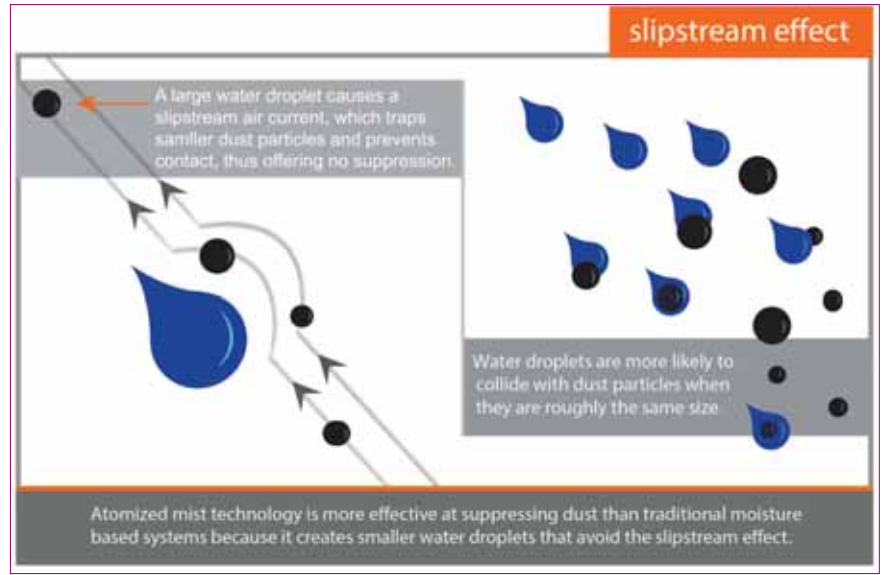
Energy Research Center at Lehigh University[2], “Although lignite power plants are designed to burn coals containing 40% or more moisture, a reduction in coal moisture content is attractive, since it will result in significant improvements in operation and performance and reductions in stack emissions. High fuel moisture content adversely affects the material handling systems, such as coal pulverizers, the heat content of the fuel (HHV) and, consequently, boiler and unit efficiency. In addition, the fuel moisture evaporated during the combustion process increases the volume of the flue gas stream. This results in an increase in fan power and decreased performance of environmental control systems.”

Besides the moisture content and runoff issue, operators have discovered that high-volume sprinkler and water cannon systems do not control airborne dust, and coal-handling operations of all sizes have begun taking notice of a suppression technology embraced by other dust-producing industries like quarries and demolition contractors.

Addressing similar air quality regulations from the EPA, operators using atomized mist have found that it mitigates dust emissions both in the air and on the surface of debris piles, with minimal amounts of runoff. Using far less water than large sprinkler systems, airborne mist helps power plants, processing operations and transfer stations remain compliant with current standards and potentially avoid further regulations regarding wastewater. Additionally, the technology drastically reduces the moisture content of material.

**THE SCIENCE OF DUST SUPPRESSION**

One of the reasons why industrial sprinkler systems like those used by many coal storage handlers in Chicago and around the country are unsuccessful at managing airborne dust is because of the ‘slipstream effect’, which prevents large droplets of water from effectively capturing small



airborne dust particles. When droplets fall, they cause air molecules to move around them in a current called a slipstream. The force of this effect is relative to the size and speed of the droplet. When small airborne particles encounter a large droplet like those from a sprinkler, they can get caught in this current, causing them to deflect away from the droplet rather than colliding with it and being absorbed.

To improve the effectiveness of trapping airborne dust with water, a technology called ‘variable particle sizing’ (VPS) is used to adjust the droplet size to match the size of the dust particles. According to the US National Institutes of Environmental Health Sciences[3], a cross section of the average human hair is about 100 microns in diameter, the same threshold at which the US Environmental Protection Agency (EPA) considers dust to be inhalable through the nose and mouth. Dust particles that are 200 microns or smaller are able to linger in the air and travel on naturally occurring atmospheric currents. This is also true for water droplets. These particles and droplets are no longer visible to the naked eye below 50 microns.

Industrial sprinkler systems typically create droplets between 200 and 10,000

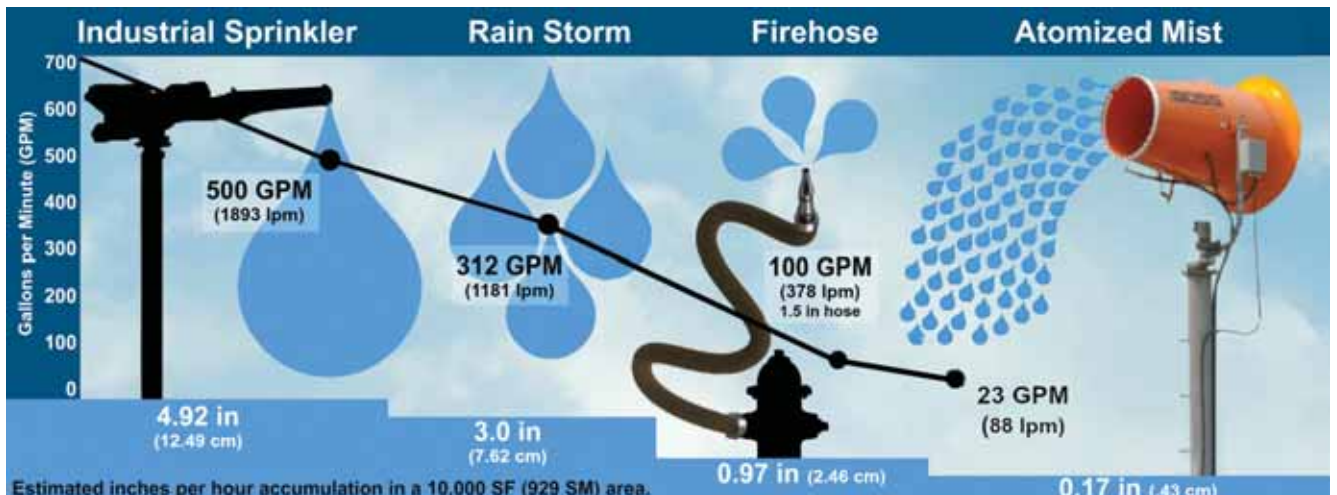
microns in size[3], whereas atomized mist uses VPS to produce droplets between 50 and 200 microns. While sprinkler droplets quickly fall to the ground without encountering a high number of airborne dust particles, millions of the smaller atomized droplets are introduced into the atmosphere surrounding coal storage piles, travelling with the dust and colliding with the particles, absorbing them and using the collective mass to drive both to the ground.

**PRODUCT LOSS & WATER USAGE**

Rainfall, snow and ice runoff can be predicted through rainfall averages and accurate weather modelling to engineer a site’s water drainage. Industrial sprinklers, on the other hand, can erode an

[2] Sarunac, Nenad, Edward K. Levy, et al. “Coal Drying Improves Performance And Reduces Emissions”, Energy Research Center, Lehigh University, Bethlehem, Pennsylvania. 2012 [http://www.lehigh.edu/energy/research/PDF/Coal%20Drying\\_Paper%201.pdf](http://www.lehigh.edu/energy/research/PDF/Coal%20Drying_Paper%201.pdf)

[3] Staff, “Particles: Size Makes All The Difference”, National Institute of Environmental Health Services, Research Triangle Park, NC, 2006. [https://www.niehs.nih.gov/health/assets/docs\\_a\\_e/ehp\\_student\\_edition\\_lesson\\_particles\\_size\\_makes\\_all\\_the\\_difference.pdf](https://www.niehs.nih.gov/health/assets/docs_a_e/ehp_student_edition_lesson_particles_size_makes_all_the_difference.pdf)



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unreasonable amount of product, strain containment systems and consume massive amounts of water, often exceeding even the hardest downpour.

For example, a hard 3-inch per hour rainfall on a 10,000ft<sup>2</sup> area will produce about 18,700 gallons (70,787 litres) an hour at the rate of 312GPM (1,181LPM). For many facilities, that's enough to flood catch basins and stress drainage systems. Large industrial sprinkler systems commonly used for dust suppression propel a long stream of water over storage piles,



*One atomized misting unit can cover as much as 280,000 SF with a powerful dust-trapping plume.*

*The devices can be tower-mounted for precise aiming and longer range.*



Utilizing a 359° oscillator, a single unit can cover as much as 125,000ft<sup>2</sup> (11,612m<sup>2</sup>) of area by throwing an engineered mist in a 200ft-long (60m) cone using a powerful 25HP industrial fan. Larger units can cover as much as 280,000ft<sup>2</sup>, using less than 40GPM (151.4LPM) of water.

Atomized mist settles gently on the surface of material without saturation, controlling the moisture content and weight of the product. Lower water usage means less runoff and pooling, reducing product loss and overall operating costs.

#### THE LOGISTICS OF DUST CONTROL

Though wind is a concern when storing any bulk material outdoors, the process of offloading, disruption and loading of material into trucks, trains, barges and containers is the primary cause of coal dust. This makes identifying problem areas and employing the correct dust suppression technology very important around these operations.

To better address dust from surface material caused by wind, coal storage facilities have successfully employed surfactants and utilized atomized mist as a more even and thorough chemical delivery method. Surfactants are compounds that mitigate the hydrophobic qualities of coal, allowing droplets to spread more effectively and prevent dust from escaping. When equipped with a dosing pump, atomized mist can distribute water and dissolved chemicals evenly across the surface of the pile. The angle of the misting machine can be adjusted so that it provides control of both surface dust and airborne particles.

To combat dust emissions caused by offloading and disruption, atomized mist units employ a specialized barrel design

saturation the surface with a volume of 500GPM (1,893LPM) or more within a typical coverage area of 91,476–396,396ft<sup>2</sup> (8,498–36,826m<sup>2</sup>).<sup>[4]</sup>

By using high-powered industrial sprinklers, the cost of water can become a major expenditure and require more extensive runoff control systems, as well as increased man-hours devoted to management.

Even a large atomized misting machine, such as the DustBoss® 60 (DB-60) manufactured by BossTek averages a fraction of the water usage at just 23GPM (88LPM), requiring a minimum inlet pressure of only 10PSI (0.7 BAR).

[4] Harrison, Kerry, "Factors to Consider in Selecting a Farm Irrigation System: Table 1", University of Georgia, College of Agricultural and Environmental Sciences, Athens, GA, 2012. <http://extension.uga.edu/publications/detail.cfm?number=B882>

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*Atomized mist technology can also be applied for point-specific suppression at discharge points.*

with an industrial fan on one end and a misting ring on the other. The machines can either be tower mounted or placed on moveable trailers for additional versatility. Units can be aimed and adjusted by remote control to address a specific location, and can be equipped with adjustable oscillation to cover a wide area. Trailer mounted units are easily relocated to provide coverage at

problem areas across the entire worksite or in response to changing wind patterns.

Loading onto barges, ships and containers from a conveyor can cause dust to travel long distances. As an additional option for dust management, a ring mounted at the discharge point can create a curtain of atomized mist around the falling cargo, preventing dust from escaping

and directing it back into the main material flow.

#### **ECONOMICAL SOLUTIONS TO ENVIRONMENTAL PROBLEMS**

Operators of coal storage facilities, local residents, environmental groups, and state and federal officials need to agree on a list of best-practice solutions that will keep jobs in the area with as little environmental impact as possible. Given that the current approaches to coal dust management have not resolved all of the issues, more economically viable alternatives to extreme solutions like enclosures should be thoroughly reviewed and considered before making them universally required.

Atomized misting systems have allowed coal-handling companies to engage in environmentally responsible dust control with considerably less product loss and water usage than large-scale sprinkling systems. It could very well be the solution that makes the most economic and ecological sense for the coal industry, as well.



*Even a large atomized misting machine from BossTek uses just 23GPM (88LPM) to help prevent material saturation and runoff.*

## Gambarotta Gschwendt coal handling products: fully tested and explosion-proof



*Pan conveyor.*

Gambarotta Gschwendt is world-renowned in the design, construction and installation of equipment for the elevating and transport of solid bulk materials — and coal is one of many cargoes carried by its equipment. The company designs, produces and supplies standard and customized machinery for cement, lime and gypsum industries as well as for the metallurgical, chemical, petrochemical, fertilizer, power generation and other similar industries.

The constant updating of its design solutions, supported by the data gathered on the field during the after-sales activities all around the world, ensures a constant improvement in Gambarotta Gschwendt's production process.

In many areas of industry, there has been a recent return to using coal as a primary energy

source — this is partly for economic reasons and partly because of the security of supply that coal can guarantee.

In certain specific situations, however, the handling and transportation of coal can

represent a danger of explosion. This depends on various factors: the type of coal involved, its granulometry, the humidity and the presence of certain volatile substances.

In order to be in the position to offer its



*Bucket elevator.*



*Bucket elevator.*



*Bucket elevator.*

clients transport systems which really are secure, Gambarotta Gschwendt Srl has drawn up a series of internal recommendations which deal specifically with the danger of explosion in the lifting and transport of coal. Its recommendations were prepared on the basis of detailed research and with consultants who have considerable experience in this field.

The recommendations take into consideration the particular conditions a machine is operating in, vibration, friction, turbulence, complex internal geometry, etc.

Gambarotta Gschwendt is thus in a position to supply reliable equipment, that is completely tested against the risk of explosion.

Among the products offered for the handling of coal are:

- ❖ surface feeders;
- ❖ pan conveyors;
- ❖ bucket elevators;
- ❖ drag chain conveyors;
- ❖ screw conveyors;
- ❖ rotary valves, flap valves;
- ❖ bulk material loading systems;
- ❖ spare parts; and
- ❖ weighing systems.



*Gambarotta Gschwendt screw conveyor in the workshop.*

## Using ADS™ Dry Fog in coal operations keeps dust under control

Coal has been the main power source for world development over the last century and still has an important role feeding powerplants almost everywhere, with more emphasis on the developing countries, writes Gonzalo Campos Canessa, CEO of TRC (the Raring Corporation). After the Fukushima nuclear disaster, many countries decided to cancel their nuclear plans and to stay with coal, or switch to coal or other fossil fuels. The USA recently created some incentives to promote the use of its coal reserves. Both China and India are intensive users of coal to power their factories and help them support their continuous growth. Also, the coal reserves in the world are massive and can last hundreds of years at the current level of consumption, so it is unlikely to disappear too fast from the energy pool.

Coal reserves are located in different areas of the world, which explains the different types of coals available in terms of moisture content, heat content and fines content. These coal reserves are concentrated normally far away from the points of consumption, so shipping and handling is an important issue on the coal industry and this is when the Raring Corp gets into this business, helping its clients to control the dust problem, first on the coal extraction and processing, then on the ship/train loaders, ship/train unloaders and finally feeding the boilers at power stations.

The Raring Corporation is able to help control dust emitted by coal during its journey from the mine until it arrives with the end user, and is heavily involved in the different industries: coal mines; exporting/importing ports; and power plants. The heat content of the coal and its price depend on the moisture content, so it is not desirable to add tonnes of water to the coal at most of the stages during its journey. ADS™ Dry Fog is a good fit for controlling the dust during coal handling operations while dealing with this water restriction.

TRC dust suppression systems use a sophisticated nozzle, an acoustic one, to fracture water into a cloud of extremely small droplets that are in the same size range as the airborne respirable dust. TRC high-tech FP nozzles use compressed air to create high frequency sound waves that shatter water into the fog-sized droplets needed while retaining adequate kinetic energy to project the ADS™ Dry Fog where it's needed and penetrate through opposing air flows.

TRC FP nozzles incorporate relatively



large liquid ports which act along with the acoustic nature of the nozzles to resist plugging. Acting in the same way that clouds cleanse the atmosphere of dust, the water droplets agglomerate with the dust particles, become heavier, and settle back to their source.

In previous articles in this same magazine, I have talked about dust applications in ports — shiploaders, unloading hoppers and Windfences — and an application at power plants — ADS™ Dry Fog at rotary rail dumps. All three types of dust suppression systems are seen in coal material handling and they also need to work together with passive dust control systems, such as the PEBCO telescopic chute, Windfence and curved wall-wiper blade respectively.

Dust control is a combination of two elements, passive and active. The active dust control systems are those that use energy to operate, which in our case corresponds to ADS™ dust suppression. Regarding the passive dust control system, we can say that it is as important as the active one, and they must work together. The passive dust control system is a key element that creates an isolated volume to avoid external influences where dust is generated allowing the active dust control system to work properly.

Agglomerative Dust Suppression Systems (ADS™) have earned a reputation as effective, relatively low-cost solutions for the control of fugitive and nuisance dust in coal-fired power plants. They are an excellent alternative to dust extraction with bag houses and/or for upgrading existing dust control systems when plants convert to dustier coals such as PRB or unwashed South American sources. Good

examples of ADS™ Dry Fog used to replace dust collectors and upgrade dust control performance in power plants are our rotary rail dump projects. All those projects have addressed the challenges of displaced air containment, operation in sub-freezing weather, automated control, and installation during minimal unscheduled outages. For more details about the rotary rail dumps application, take a look at our article in the July 2018 issue of this magazine.

At the Raring Corp, we have been designing, manufacturing and supplying both Agglomerative Dust Suppression Systems (ADS™) and Water Spray Systems (WSS) for the last 34 years and we are convinced that our systems couldn't be as successful without the passive dust control features.

Water Spray Systems can be carefully applied during coal material handling at the stockpiles. The coal can spend long periods of times sitting in a yard waiting to be burned or shipped, and it gets dry. The drier it gets, the dustier it is. To prevent generating dust from the stockpiles, it is a good idea to increase its moisture, using Yard Spray systems, to reduce the capacity of the stocked material to generate dust. This will wet the first layer of the piles, with nozzles arranged in strategic locations to cover the whole area and to take turns to turn ON/OFF each nozzle.

During our many years of working on dust control, ADS™ Dry Fog has proven to be well suited for working on coal material handling because it adds no moisture to the coal, it is easy to install and maintain and the investment is moderate compare to other technologies. Regarding the WSS, the recommendation is to use them in stockpiles.

## Cotecna: major provider of quality assurance services for the coal industry

Cotecna provides testing, inspection and certification services to facilitate trade and make supply chains more efficient for its clients. Founded in Switzerland in 1974, this family-owned business has now grown to become a world-class international player with 3,000 employees in close to 100 offices across more than 50 countries. Its trusted network of professionals and certified laboratories provide expertise across some key sectors: coal, minerals and metals, agriculture and food, government and trade, and general cargo.

The coal market trades a wide variety of qualities and standards, and it is therefore important for all participants to benefit from accredited quality assessment services in order to meet their contractual or regulatory specifications. Cotecna helps its clients to comply with recognized sampling and analytical standards and methods, thereby enabling them to mitigate quality-associated trading issues and financial risks. Cotecna's added-value also consists in helping clients make business more transparent and sustainable, by ensuring that coal cargoes comply with environmental standards and other norms.

Cotecna's operational units and laboratories are strategically located to cover the most important steam and metallurgical coal trading centres worldwide, in which it offers specialized services to major and local industry players. Its services range from independent assessments of the quality and quantity of the product to consultancy and bespoke training solutions.

Cotecna's activities cover the entire coal supply chain: it supports producers in delivering coal to final users in accordance with contractual and regulatory quality and quantity specifications, thus maximizing profitability while protecting customers' interests. Respecting quality standards is of benefit to the different parties involved at all stages of the process, and contributes to the market competitiveness.

At the mining stage, Cotecna helps the industry deal with geological variability in product quality and volumes with exploration geological core analysis. Coal is then processed at preparation plants to minimize this variability and maximize yields. To address quality needs and make



sure its clients' processes comply with national and international standards at this step, Cotecna provides a wide range of services including run-of-the-mill sampling and analysis, sample preparation, bulk screening and washing, as well as management of characterization and liberation projects. Bench-type samples can be prepared using unique techniques to ensure the sample integrity.

In South Africa, for instance, Cotecna is recognized as one of the most proficient inspection and testing companies in the mining sector. It manages on-site laboratories, design sampling systems in accordance with ISO standards, and audit washing plants to optimize processes. It allows producers to consistently achieve the requirements of their product and meet market needs.

Cotecna also supervises loading, discharge and transshipment operations at most major ports handling coal cargoes.

At loading ports, Cotecna provides numerous services such as hold inspections, loading supervision, weight determination surveys using shore scales and/or draught surveys, sampling or automatic sampling supervision, hatch cover sealing and marine surveys. Samples are sent to its accredited laboratories for preparation and analysis according to the contractual and regulatory specifications required in the transaction. The resulting quantity and quality determinations are then certified and used for the financial settlement of the sale contract covering

the cargo.

At discharge ports, Cotecna's intervention typically includes weight determination, as well as sampling and analysis, often required by the authorities to ensure that the coal meets environmental regulation limits.

When it comes to storage, Cotecna can offer stock monitoring services in order to improve access to financing for borrowers. Thus, it mitigates transaction risks for lenders and assists in compliance with the requirements of the Basel frameworks for traders.

Drawing on this extensive experience, Cotecna was appointed by the Indian Central Institute of Mining and Fuel Research (CSIR-CIMFR) in 2016 to sample over 300 million metric tonnes of domestic coal per annum, at mines and thermal power plants. Its teams of inspectors are responsible for performing both sampling and sample preparation. Cotecna now stands as the largest coal inspection agency in India, and has a team of over 3,000 contractors and employees located in coal mines and at over 50 thermal power plants across the country.

To stay competitive in this dynamic market, Cotecna is continuously investing in modern facilities and cutting-edge equipment. It maintains an innovative approach to the industry, providing technical expertise and unique solutions to individual challenges. Cotecna keeps expanding its network, while staying very reactive and approachable.

# Coal handling operations to start at Black Sea Port of Taman

The dry bulk terminal of OTEKO in the Port of Taman in Russia will start handling coal in October. Reports from the Krasnodar Region Administration say that this information comes from Territory Governor Veniamin Kondratyev.

According to Kondratyev, the dry bulk terminal project at the Port of Taman is in its final phase. The land development and purchase of equipment has taken place, and the construction of the hydraulic engineering structure is nearing completion. Assembly of metal structures is underway.

“In the nearest time the company is going to

commence start-up and adjustment of Phase I facilities. The beginning of coal handling operations is scheduled for this October,” said the governor.

The group of companies, United Freight Forwarding Company (OTEKO Group) is the largest private investor in port infrastructure in southern Russia. Since 2000, OTEKO Group has been

implementing a comprehensive investment programme for the construction of terminal facilities in the Port of Taman. It is expected to become the second-largest port in the southern region of Russia.

Its new facilities will include:

- ❖ dry bulk cargo terminal for the export of iron ore, coal, sulphur and mineral ore with a target capacity of 35mt (million tonnes) per year;
- ❖ grain terminal with a turnover of 14.5mt; and
- ❖ heavy lift and project cargo terminal.

The Taman dry bulk terminal will be the first among the Russian ports in the Black Sea to accept Capesize vessels with tonnages of up to 220,000dwt.



## Cita Energy Services: quality control when handling coal

CITA Logistics LLC, established in 2004 and registered in the State of Delaware, USA, offers customers a range of services through three distinct departments; Cita Energy Services, Cita Shipping Agency, and Cita Logistics. The company as whole specializes in bulk logistics services, including bulk ore sampling, analysis and inspection, vessel agency, freight forwarding, logistics management, statistical data and market intelligence, with coal an important part of its business. Its offices are located a short distance from ports on the East Coast of the USA (Norfolk, Virginia) and the East Coast of Australia (Mackay, Queensland).

The testing division, Cita Energy Services, is an accredited ISO 17025:2005 coal testing laboratory. Its client base is

comprised of international customers in the steel and energy sector as well as domestic producers. The ISO accreditation provides a framework of technical guidelines ensuring traceability of results, participation in proficiency testing and regular audits of all lab processes. To ensure the very best service for its customers, Cita Energy Services is audited twice annually. In addition to external proficiency testing, Cita Energy Services conducts internal round-robins to ensure that its services and staff are committed to constantly improving and serve an important purpose to both coal suppliers and the end users.

Producing a series of analysis results that are reliable with minimum deviation cannot be achieved without correct

preparation. Consistency of the sample is an imperative element when reporting a single point analysis of data representing a 75,000 metric tonnes cargo.

Cita Energy Services receives samples in a variety of ways; direct from railcars, stockpiles and/or from sampling stations at the time of vessel loading. A chain of custody is maintained throughout the process from sampling point to the sample being received in the lab and throughout the testing process within the lab itself. If conducted at a third party sampling agency, an inspector from CES can witness the sample preparation to ensure regulatory measures are followed for chain of custody and storage.

Sample preparation follows a specific SOP (standard operating procedures).



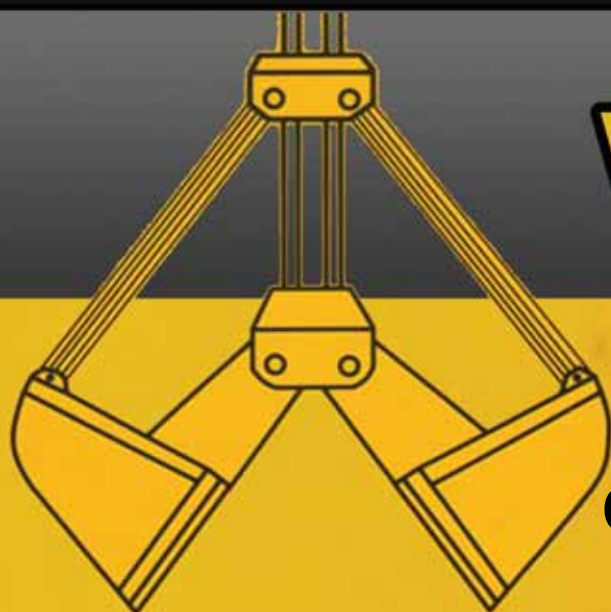
*Throughout the preparation process, a chain of custody and identification process is followed with each sample. This ensures that the correct analysis is performed on the correct samples.*



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After completion of vessel loading, gross samples are collected at the sampling agency by Cita Energy Services personnel. Gross sample bag identifications are compared to sampling agency's chain of custody by CES's inspector. Sublot identification and tonnage are transferred to CES's chain of custody at this time and are signed by sampling agency and CES personnel. Gross samples are then transported to the lab. Gross sample bag tags are rechecked and organized into correct sublots. Samples are then either run through the mechanical sample divider/crusher or through the manual sample divider, depending on load ports sampling system's crusher size.

Proper mixing of all coal collected in a specific sublot is crucial to obtaining a true representative sample of the sublot. In most situations during gross sample reduction, CES will collect two samples of approximately 5,000 grams, one sample for laboratory analysis and one sample as a reserve/referee sample. As reduced samples are collected proper tags which were created prior to sample reduction are tied to each sample indicating laboratory or

reserve/referee sample. After reduction, all sample info including vessel name, voyage number, coal type, sublot number, and tonnage are entered into the LIMS (Laboratory Information Management System). At this time a unique laboratory sample number is generated, which will identify the sample throughout the analysis process all the way to certificate generation.

Witnessing of the sampling agency and

equipment by the CES inspector serves an important function for customers who are located abroad, as CES acts on their behalf to verify specific standards for sampling/preparation equipment and functions are being met. Sample preparation, chain of custody and verification are of a great importance for Cita Energy Services, as the impact of missed steps along these processes can lead to errors in the analysis results.



## Telestack mobile coal handling systems bring efficiency and flexibility to dry bulk logistics

The port of Buenaventura rests in the Pacific Coast, on the southwest region of the Republic of Colombia and is home to Columbia's largest industrial port. This is one of Colombia's most important ports in the Pacific due to the sheer volumes handled. In a key strategic location, the port is equipped to handle grains, bulk cargo, and multipurpose vessels, through a specialized infrastructure tailored for these purposes and the recent US\$120 million investment into the port allowed for its further enhancement and development.

In collaboration with a Colombian company, Boscoal looked to enhance its shiploading system to maximize its coal and petcoke exporting operation. After much research that included site visits to similar applications, Telestack was appointed to custom design and manufacture a rail-mounted shiploading system to integrate with its existing range of overland and field conveyors and form an intricate part of its petcoke and coal shiploading process. The TS 1250 Telescopic section is mounted onto a gantry system which is fed by a combination of tripper conveyors and overland/field conveyor system. The material is then loaded directly onto Handymax and Panamax vessels.

### RESULTS

One of the key purchasing decisions was Telestack's experience and extensive list of successful installations in coal and petcoke applications. Boscoal's scope of supply was clear. Firstly it was necessary to maintain the product integrity whilst incorporating design features adapted to the abrasive and dusty nature of the products and secondly the unit had to be designed to easily incorporate into an existing infrastructure. This was to be achieved within the overall scope of maximizing the efficiency of the export operation.

### INCREASED PRODUCT INTEGRITY

Degradation and contamination of material is an issue that every coal and petcoke producer has to consider carefully. Frequent handling, especially of the petcoke, could compromise the composition and size of the product which could, in effect, reduce the selling price per tonne, so first-hand application experience



was a qualifying factor in the supplier choice. In addition the proven success of the Cleveland cascade chute at the end of the conveyor was important. With its angled cones (which slows the trajectory of material into the vessel) allows for added dust control as well as a fully controlled manner of discharge reducing the degradation and contamination of petcoke and coal when loading the vessel.

### ENVIRONMENTALLY SENSITIVE

Due to the dusty nature of the product, it was important to incorporate several dust control measures to accommodate the environmentally sensitive area. Fitted with fully galvanized dust covers on the full length of the outer conveyor, side wind plates on the inner conveyor, a retractable canvas telescopic dust cover on the inner conveyor and a fully enclosed hood at transfer point, the entire shiploading process is now virtually dust free and simple to operate using the radio remote control. The highly abrasive nature of the



petcoke and coal also required several features to manage the harsh nature and protect the wear cycle of the product. Telestack incorporated lined transfer points, feed-boots and ceramic lining to ensure that the unit was designed to wear the abrasive nature of the products and reduce maintenance costs.

### FULLY CUSTOMIZED SYSTEM

It was important to Boscoal that Telestack's design complemented the existing tripper/field conveyors and that its system could integrate seamlessly. Not only could Telestack draw upon its application knowledge, it also had extensive experience in rail-mounted systems. In Ukraine alone for example, Telestack has installed no fewer than 18 rail-mounted systems, all custom-designed to serve the grain industry and had much experience in rail-mounted systems to reference. The benefits of the rail system ensure that the customer had a reliable and fit-for-purpose loading system that offered an effective, efficient and reliable operation.

### TELESTACK RANGE OF SHIPLOADING EQUIPMENT

Telestack specializes in the complete design, manufacture, installation and commissioning of mobile, bulk material handling systems for the inland ports and terminals, aggregates and mining sectors.

Telestack's range of port equipment encompasses radial telescopic shiploaders, shiploading direct from trucks, direct feed shiploaders, rail-mounted shiploaders, cambered boom shiploaders and dockside unloading hoppers.

To complement each specific application, Telestack also offers an extensive range of options so that all shiploading units are specific to the needs of the customer.

### PERSONALIZED SERVICE

Telestack is renowned throughout the globe for its personalized service. The team of engineering and sales specialists works very closely with customers throughout each stage of the process from pre-sales and pre-engineering to ensure that the equipment is specific to the project. Its product portfolio is vast as is its application knowledge.

## Where there is coal, there is coal dust

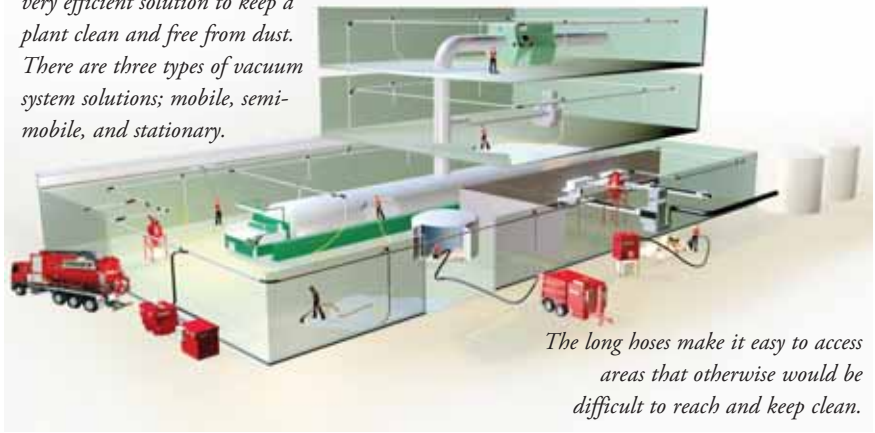
The history of coal mining goes back thousands of years. It became especially important during the Industrial Revolution of the 19th and 20th centuries, when it was primarily used to power steam engines, heat buildings, and generate electricity. Today there are more than 7,269mt (million tonnes) of hard coal being produced worldwide.

The top five largest coal-producing countries are China, USA, India, Australia, and Indonesia.

### HOW TO ELIMINATE THE DUST

There is no secret, with coal comes the

*Using vacuum technology is a very efficient solution to keep a plant clean and free from dust. There are three types of vacuum system solutions; mobile, semi-mobile, and stationary.*



*The long hoses make it easy to access areas that otherwise would be difficult to reach and keep clean.*

*A specially designed fire extinguishing system is being used to water the piles of coal pellets to reduce dust build-ups.*



benefits of using a vacuum system to clean a coal plant/terminal:

1. Vacuum systems help facilitate good housekeeping standards by cleaning and removing hazardous dust and spillages. Good housekeeping also increases shelf life for the equipment being used.
2. The ability to recycle spilled material back into production process, avoiding economic losses.
3. Replacing heavy and hazardous manual work.

There are many different vacuum system solutions available on the market. It can be difficult knowing what type of system works best in order to get the job done right. Christer Magnusson, Sales Director DISAB Vacuum Technology AB,

dust. Fine unhealthy dust. Minimizing coal dust is a high priority as controlling coal dust is vital to worker safety due to the risk of not only coal dust explosions but also the hazardous airborne particulates. While working in a coal handling plant, it has shown that one major factor reducing staff efficiency is the working environment i.e. a dusty atmosphere. Lots of care is therefore taken to reduce these airborne dust particulates as a direct action to improve workers safety.

In addition to creating a safe work environment, eliminating coal dust is important as it otherwise could increase the cost of maintaining material handling equipment. When water is being mixed with the coal dust and applied to a metallic surface, it generates a corrosive acid. This can occur when the coal dust spreads to surrounding areas and nearby buildings, machines, and trucks.

Now that we have established concerns about coal dust, one may wonder if there are any proven solutions to help eliminate coal dust in a fast and cost effective manner.

*"We start to see an increase of requests for vacloaders equipped with a fire extinguish system solution as it helps improving work environment," says Christer Magnusson, Director of Sales DISAB Vacuum Technology AB.*



### VACUUMING THE PROBLEMS AWAY

A wide range of techniques is used to manage, control, and prevent coal dust in and around coal plants and coal terminals. A very efficient way of keeping the dust under control is to use industrial vacuum system solutions. There are three great

helps clarify the differences between the most common solutions. "A mobile vacuum system, a so-called vacuum truck or vacloader, can be used for any type of material that is capable of fitting into an 8" hose. A vacloader has a very strong performance, exceeding 90% vacuum

efficiency and delivering up to 200kW of suction power.

A semi-mobile vacuum system is powerful yet self-contained unit providing high levels of vacuum that can vacuuming fine dust and waste up to 40mm. This type of solution is easy to handle and can easily be transported around the plant with the help of a crane, forklift or tractor. The third type of vacuum solution is a stationary vacuum system, which is a custom-made solution where the centralized vacuum system is being integrated into existing, or new, piping system.” Magnusson continues to explain how all these different types of vacuum systems are beneficial to use within the coal industry. “It can be especially



*One of DISAB's customers is using a DISAB Sweepvac™ along with a DISAB vacloader for its coal terminal and collects 5,000m<sup>3</sup> of coal material that it recycles back into production each year.*



*The DISAB-CLEAN uses high vacuum technology in combination with a dust-free brush system to effectively clean large street and area surfaces. The collected coal material can be recycled back into production.*

difficult to keep it clean in narrow and hard-to-reach areas such as around the bucket elevators and conveyor belts etc. But by using hoses up to 200m, you can easily get around and clean in areas that normally would be too difficult to access.”

### KEEPING A DUST-FREE ENVIRONMENT BOTH INDOORS AND OUTDOORS

It may be easy to visualize and understand that there will be a high amount of dust and airborne particulates inside of a coal plant. What about the outside? Magnusson continues to talk about the importance to consider different methods of eliminating dust build-ups indoors as well as outdoors. “When you visit a coal plant or a coal terminal it is not uncommon to see a rather thick layer of dust surrounding the area. Not only is this polluted air a hazard for the workers, but it can also create harm for the neighbouring houses,” Magnusson states.

Magnusson explains how DISAB Vacuum Technology AB has developed a unique fire extinguishing system on its mobile vacuum system. “We’ve seen an increase in demands for a solution targeting coal plants in particular, where our customers request

multiple functions for our vacloaders. The vacloaders are already equipped with features that allow them to vacuum, transport, and discharging coal material. This new feature is a dust suppress system which also allows them to watering the piles of coal pellets to eliminate dust and other harmful air pollutants,” Magnusson explains.

### SAVING MONEY BY RECYCLING SPILLED MATERIAL BACK INTO PRODUCTION

Magnusson continues to explain how a so-called DISAB Sweepvac™ can be attached to a vacloader, providing it with the ability to efficiently vacuuming the spillages from the surrounding streets and area surfaces. “Not only does the dust and spillages give a poor impression but it is also waste of money as the coal material could be recycled back into the production process,” Magnusson claims. Using a DISAB Sweepvac™ is a very efficient way of cleaning. An area that normally takes 12 hours to clean without using vacuum, takes less than two hours to clean when using a DISAB Sweepvac™. The coal material being recovered can easily be recycled back into production, which helps saving money.

Another solution is to use DISA-CLEAN, a water-free street and area sweeper using vacuum technology to remove unwanted dust and to recover valuable materials, like coal. The DISA-CLEAN technology uses traditional brooms and side brushes, uniquely encapsulated with vacuum aspiration, eliminating swirling dust around the brooms and brushes. “Our DISA-CLEAN is unique to the market since it doesn’t use any water like many of the conventional sweepers do,” says Tomas Björk, Business Unit Manager for Road & Area Sweepers at DISAB Vacuum Technology AB.

Directly behind the DISA-CLEAN’s broom system there is a specially designed powerful vacuum nozzle covering the full 2,500mm width of the truck. It vacuums the surface with a suction power up to 1,600kg, ensuring that also the finest particles (PM10 & PM2.5) will be removed all the way down the bottom of asphalt cavities. The material is vacuumed into the specially designed four-step separation/filter system tank where it is contained, ensuring that the exhaust air is filtered down to below PM2.5 particles.

The DISA-CLEAN’s operational speed and large suction width ensure a large area cleaned and swept every day with up to 50,000m<sup>2</sup>/hour. In addition, as it uses no water, there is no wet slurry left on ground (i.e. possible to run indoors in warehouses and tents), no water spillage in the water runoffs, contaminating waterways and cleaning stations, and no risk of icy surfaces if cleaning during winter.

“One of our customers was able to recover 10,000m<sup>3</sup> of spilled coal material during a two-year period by using a DISAB Sweepvac™ alone. That equals a minimum value of \$230,000 that they were able to recover back into production each year”, Björk concludes.

# Stock control

why having the right equipment in the stockyard is so important



*A direct hydraulic drive system reduces installation requirements on the machine and lowers the overall investment. The drive ensures quicker payback through an improved productivity, high availability, lower running cost and longer life span.*

Louise Dodds-Ely

## Hydraulic direct drives – a perfect solution for bucketwheel reclaimers

The more demanding and varied the application and environment, the more robust and versatile a drive system needs to be. This is one of the reasons why the hydraulic direct drive is such a natural in the demanding environments and operation situations associated with materials handling.

Bucketwheel reclaimers handle a variety of materials, and operate under a wide range of different conditions. On occasion, they are exposed to the risk of overloads. A robust hydraulic direct drive system is the perfect solution to this problem, ensuring that they keep on running even in the toughest of environments.

### HYDRAULIC DIRECT DRIVES AND THEIR USE

Hydraulic direct drives have very specific operating characteristics that make them highly valuable in many industrial heavy-duty applications. They are perfect for applications requiring high torque and low speed and really show their value when variable speed is used.

The advantages of using direct hydraulic drive systems for powering bucketwheel reclaimers are quite apparent. Controllable variable speed optimizes the machine capacity, while overload protection and high starting torque increases the availability considerably. In addition, the highly reliable drive system for

the bucketwheel features such a low weight that the load on the slewing machinery significantly reduces. This leads to both higher uptime as well as less need for maintenance.

### OPTIMIZING MACHINE STRUCTURE

The weight of a hydraulic motor, attached directly to the bucketwheel shaft, is much less compared to that of an equivalent alternative drive that often consists of more components and a more complicated mounting.

Evidently, this weight reduction on the end of a 30–60m boom has a significant influence on the overall machine design.

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The drive unit can be located on the boom, closer to the machine centre, or on the slew deck.

Compounding the weight reduction with the low inertia of the drive and the subsequent reduction of shock loads, there are many heavy arguments for using a

hydraulic direct drive system in the design of a bucketwheel reclaimer machine.

**MEETING THE NEEDS**

Another strong argument for using a hydraulic direct drive on a bucketwheel is the versatility offered by a variable speed

drive. The ability to vary the bucketwheel speeds depending upon different materials and conditions means that capacity can be optimized. The possibility to monitor the bucketwheel torque condition and relate such information to the slew control offers considerable advantages.

## How a hydraulic drive system works

Hydraulic direct drive systems consist primarily of a hydraulic motor directly mounted on the driven shaft and a drive unit including a control system. The

drive unit comprises a fixed-speed AC induction motor and a variable displacement hydraulic pump. This drive unit provides a variable flow of oil to the

hydraulic motor in response to a control signal, enabling the speed of the hydraulic motor to be adjusted for every possible need.





Direct hydraulic drives have a very low moment of inertia which, together with the built in overload and shock load limitation protects the driven machine from stresses. The modular design of the Hägglunds direct drive system allows an optimal solution to be easily sized and tailored for any bucketwheel. With their flexible nature, hydraulic direct drives are easy to upgrade or adapt as needs change and develop over time. This makes the weight- and space-saving Hägglunds direct drive system from Bosch Rexroth ideal for bucketwheel reclaimers — both for new machines and for retrofit upgrades.

**COMPLETE SCOPE OF DRIVE SOLUTIONS FOR ALL FUNCTIONS**

There are many possibilities to optimize all functions on a bucket wheel reclaimer by coordinating the control of these. With Hägglunds direct hydraulic drive systems and products for linear functions from Bosch Rexroth there are possibilities to achieve outstanding performance also when it comes to applications like slewing, luffing, long travelling and conveyors, as well as for other functions that go with bucketwheel reclaimers.

## Key hydraulic drive benefits for bucketwheel reclaimers

- ❖ compact size;
- ❖ low weight;
- ❖ low moment of inertia;
- ❖ takes up less space and reduces stresses on machine structure;
- ❖ high torque capacity and an infinite speed control for full adaptation to any types of materials and conditions; and
- ❖ built-in overload protection eliminates trip-outs and minimizes production losses in the event of e.g. materials avalanche.



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## AUMUND India is gaining a strong foothold in the power sector

AUMUND offers a range of specialized systems for discharging bulk materials which have difficult and varying flow properties. AUMUND India's recent successes in sales of this type of equipment prove the power industry's confidence in the technological solutions provided.

HAMtek Technologies India Private Limited is a general contractor, designing and manufacturing coal handling plants. Its customer, Meenakshi Energy Private Limited has a 2 x 350MW coal-based thermal power project in Nellore District, Andhra Pradesh State, for which HAMteck has chosen two Rotary Discharge Machines type LOUISE BEW-FL from AUMUND India. This type of machine is specially designed for use in height-restricted site situations. The two machines supplied for this project will extract coal from a 25m-long hopper. They are designed with single-sided discharge, 3,000mm discharge wheel diameter and capacities of 120tph (tonnes per hour) to 1,320tph.

AUMUND India is also working on a further thermal power station project in India, where eight Rotary Discharge Machines are being considered. They are type LOUISE BEW-BL with double-sided discharge, 3,200mm discharge wheel diameter and capacities of 100 to 300tph, for the extraction of coal from covered stockpiles.

This discharge technology also finds its place in the cement industry. AUMUND India won an order from Humboldt Wedag India, Pvt. Ltd. for two CENTREX® machines for Republic Cement's

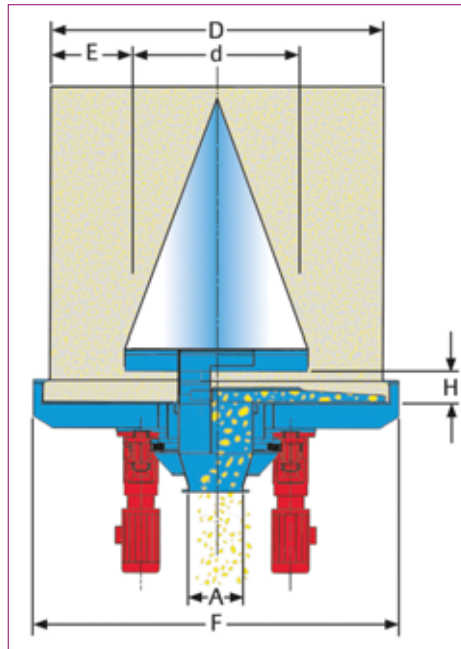
Bulacan Plant in the Philippines. These two machines, type CTX AV, with external drive unit and stationary inner cone, will extract gypsum and pozzolana from the silos. They have 3,500 and 4,500 discharge wheel diameters and 1.5 to 15tph and 9 to 90tph capacities respectively.

The drive unit of the CENTREX® CTX AV design is fitted to the discharge bottom for easy access. This design also features radially arranged support plates connecting the inner cone with the silo wall. This alternative with external drive and stationary cone offers ideal conditions for applications involving a high torque and requiring easy maintenance.

### ABOUT THE AUMUND GROUP

The AUMUND Group is active worldwide. The conveying and storage specialist has special expertise at its disposal when

dealing with bulk materials. With their high degree of individuality, both its technically sophisticated as well as innovative products have contributed to the AUMUND Group today being a market leader in many areas of conveying and storage technology. The manufacturing companies AUMUND Fördertechnik GmbH (Rheinberg, Germany), SCHADE Lagertechnik GmbH (Gelsenkirchen, Germany), SAMSON Materials Handling Ltd. (Ely, England), as well as AUMUND Group Field Service GmbH and AUMUND Logistic GmbH (Rheinberg, Germany) are consolidated under the umbrella of the AUMUND Group. The global conveying and storage technology business is spearheaded through a total of 15 locations in Asia, Europe, North and South America and a total of five warehouses in Germany, USA, Brazil, Hong Kong and Saudi Arabia.



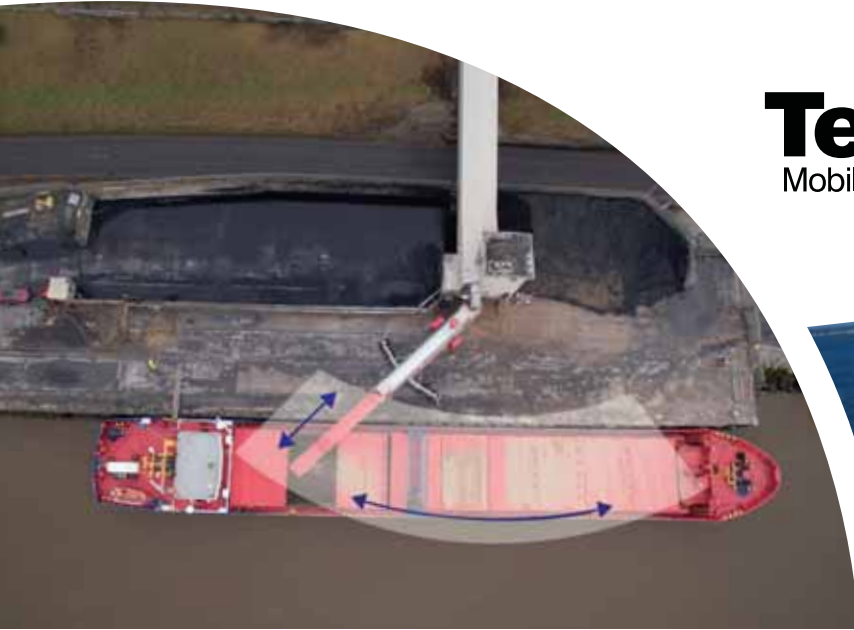
*CENTREX® CTX-AV and in the workshop (graphic and photo AUMUND).*



*AUMUND Rotary Discharge Machine type LOUISE BEW-FL (example, photo AUMUND).*



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**#MovingToMobile**

## Stacker-reclaimers made by FAM Magdeburg

Storage and homogenization of various bulk materials form a significant integral part of the bulk handling processes within the overall logistics network.

Dynamic and efficient handling of the bulk materials requires the stockyards to be equipped with appropriate technology. The scope of a typical stockyard basically includes:

- ❖ storage areas (reinforced to support the materials' weight)
- ❖ equipment for stacking and reclaiming the bulk materials
- ❖ feeding and discharging belt conveyors
- ❖ additional equipment such as sprinkling, de-dusting and fire-fighting systems.

When stockpiling operations require stacking and reclaiming to be performed at the same time, separate machines are absolutely necessary. However, in many applications simultaneous stacking and reclaiming are not required. This is when stacker-reclaimers, i.e., combined machines, become an excellent solution because their functional principle combines both types of operation.

The bucket wheel reclaimer with a reversible boom conveyor has proven to be an extremely functional, versatile machine (Fig. 1).

Stacker-reclaimers, as a rule, consist of a

*Figure 1: FAM stacker-reclaimer STR11000/7500.42 with a reversible boom conveyor is used in a coal-fired power plant in Germany for both stacking and reclaiming. As a stacker, the machine receives the material for stockpiling via a tripper car (11,000tph), and as a reclaimer, it unloads the stockpile using a bucketwheel (7,500tph).*



slewable superstructure and a rail-mounted sub-frame. Both the bucketwheel boom and the counterweight boom are hinged on the superstructure and guyed by ropes or tiebacks via a pylon. The bucketwheel boom is raised or lowered with the help of hydraulic cylinders (Fig. 1) or cable winches (Fig. 2).

As shown in Figure 2, the machine can be operated also as a stacker with the belt direction reversed and the bulk material transported to the boom head where it is discharged. Similarly to a regular stacker, the stacker-reclaimer is fed via a tripper car. When the stockpile is being built, the bucketwheel remains in its rest position.

As the boom's inclination can be adjusted and the boom itself can be slewed, it gives room for various methods of

building bulk material stockpiles. The blending process or pre-homogenization within one stockyard facility is ensured by combining a specific type of stacking technology with a specific type of reclaiming technology.

Generally speaking, the material is stacked in consecutive layers, and depending on the type of reclamation, individual, several or all of the layers can be reclaimed at the same time. The efficiency of such a blending bed is expressed by the homogenizing effect, also known as the blending effect. Figure 3 shows the basic stockpiling methods; Table I shows the respective achievable homogenization effect.

For stockpile reclaiming, the material is taken up by the bucket wheel, transported

*Figure 2: FAM stacker-reclaimer STR2630/3000.26, coal and magnetite, stacking capacity 2,600tph, reclaiming capacity 3,000tph, port facility, Mozambique.*





Figure 4: FAM stacker-reclaimer STR1000/1000.60, hard coal, stacking capacity 1,000tph, reclaiming capacity 1,000tph, coal-fired power plant, Germany.

to the machine's rotation centre by the reversible belt conveyor, and dumped into the central chute, from where the material is transferred onto a discharging stockpile conveyor running between the rails of the reclaimer (Fig. 4).

The reclamation process can be carried out in a bench-type or block operation. During the bench-type operation, after reaching the end of the stockpile, the reclaimer boom is lowered by a depth of cut and the reclamation process continues in the opposite direction. This procedure can be repeated until the stockpile is completely unloaded. In the block operation (reclamation at the face), the

TABLE 1		
Overview of stacking/reclaiming methods and their target homogenization effects		
Stacking method	Reclaiming	Homogenization effect
Cone-Shell	at the face	small
	along the side	small
Strata	at the face	moderate
	along the side	good
Chevron	at the face	good
	along the side	moderate
Windrow	at the face	very good
	along the side	very good



Figure 5: FAM stacker reclaimer STR6000/4000.67 S, iron ore concentrate, iron ore pellets, coal, stacking capacity 6,000tph, reclaiming capacity 4,000tph, USA.

stockpile is reclaimed by the bucketwheel with the boom performing periodical, crescent-type slewing motions. Every time the slewing direction changes, the chip thickness is reset by the machine travelling a short distance further. The face reclamation has been found to be especially suitable for blending beds which provide excellent homogenization of bulk materials.

Stacker-reclaimers are often designed for the handling of several different materials (Fig. 5). This increases the flexibility of the storage location in terms of materials processing, in particular in port areas, enhances the attractiveness of the entire cargo handling complex.

FAM quality prevails. Customer-specific project designing and manufacturing of the systems and devices is one of the core competences of the FAM Group. After providing to the Australian coal terminal in 2010 four identical stacker-reclaimers each

### Fig 3: overview of stockpiling methods

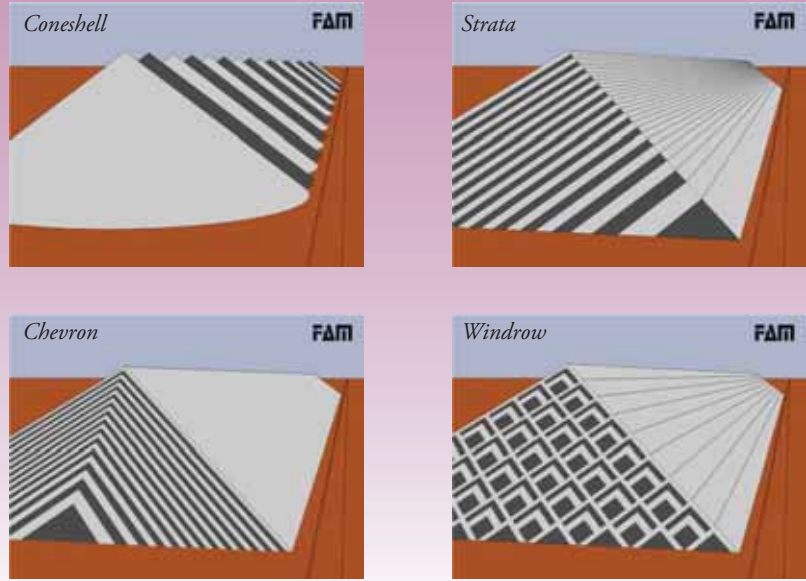


Figure 6: FAM stacker-reclaimer STR6000/8000.60, hard coal, stacking capacity 6,000tph, reclaiming capacity 8,000tph, Australia.

boom works in reversible operation while the auxiliary boom is only used for reclaiming (Figs. 7–8).

#### THE FAM GROUP

Headquartered in Magdeburg, Germany, the FAM Group has a total of 14 subsidiaries in Germany,

Bulgaria, Chile, China, Canada, Russia, Singapore, Hungary, and Australia as well as representations, among others, in South Africa and in the United States. Approximately 1,500 employees work for the FAM Group around the globe. Planning, project development, designing, manufacturing, assembly and start-up as well as servicing of bulk material conveyor systems generate a turnover of about €300

equipped with a 60m-long bucket wheel boom for the hard coal, FAM assembled and put into operation the fifth device of this kind in 2018 (Fig. 6).

For specific applications, FAM developed a range of other types of multifunctional stockyard systems. For example, portal scrapers can be also designed to work in both stacking and reclaiming mode. To this end, the portal scraper's main



Fig. 7: FAM portal scraper KP200/100.20 with stacking and reclaiming function for coke and hard coal, stacking capacity 200tph, reclaiming capacity 100tph, Chile.

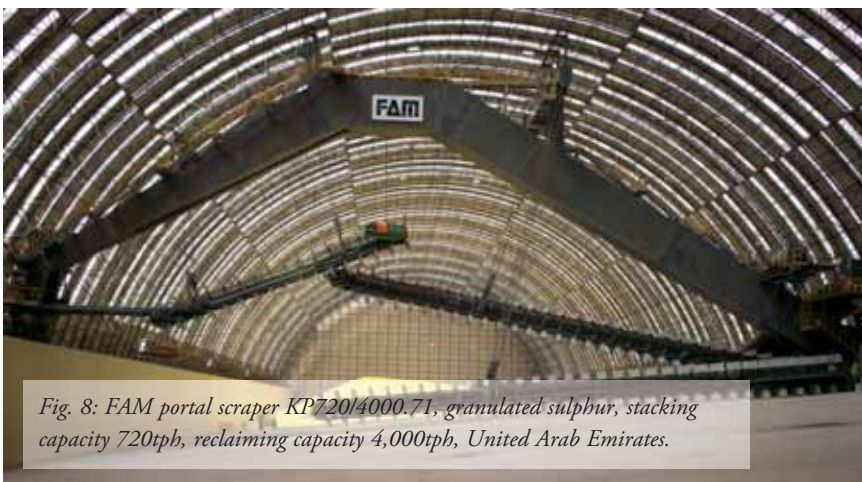


Fig. 8: FAM portal scraper KP720/4000.71, granulated sulphur, stacking capacity 720tph, reclaiming capacity 4,000tph, United Arab Emirates.

million per year.

FAM successfully plans, designs, and manufactures turnkey plants and systems for mining, conveying, loading, and storing minerals, raw materials, and goods. FAM efficiently combines its know-how of serial and custom-specific production. In addition to engineering services, the company offers a complete range of manufacturing services as well as after-sales service. For more than 100 years, FAM has incorporated in its global solutions professional competence, engineering know-how and top-level project management.

## Reducing the risk of steelcord heartbreak in stockyard conveyor systems

### A GUIDE TO USE OF STEELCORD CONVEYOR BELT RIP DETECTION SYSTEMS AND RIP-STOP BREAKERS

Because of its innate strength, good handling characteristics and low elongation (stretch), steelcord belting is primarily used to convey materials over long distances — and is very popular in stockyard conveyor systems. In many cases, this can be over several kilometres. Compared to conventional multi-ply belting, steelcord belts are appreciably more costly to manufacture and, especially because of the longer lengths involved, can be a very substantial investment indeed.

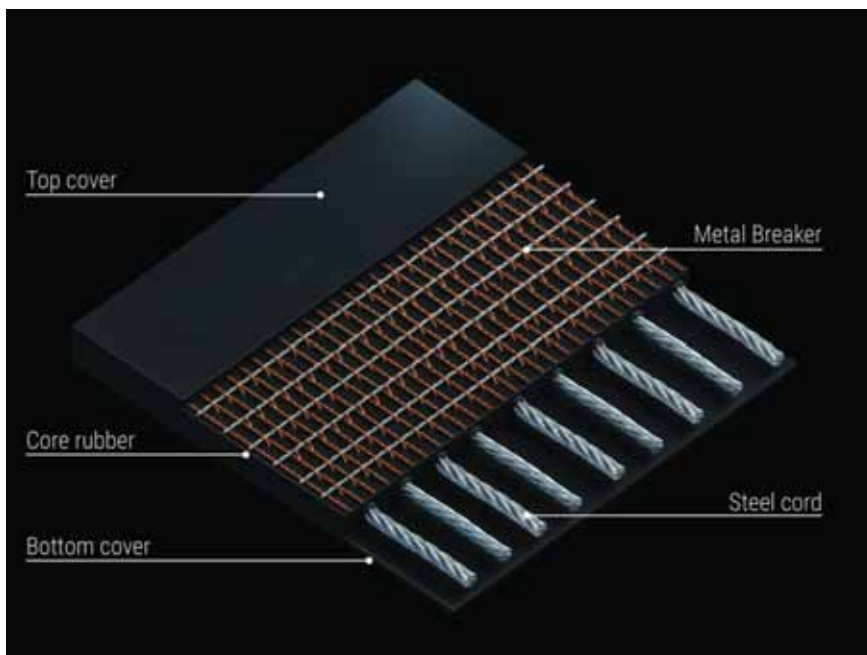
On the plus side, provided that the belt has been manufactured using good quality abrasion and ozone/UV resistant rubber, a steelcord belt should justify the initial outlay by providing a long working life. On the downside, steelcord belting does have an Achilles heel. The actual steel cords themselves are naturally very strong but they cannot prevent a trapped foreign object from penetrating through the rubber covers between the cords and ripping the belt longitudinally. A steelcord belt can quite easily be ripped apart over its entire length in a matter of minutes. *Here, Les Williams provides an insight into the two most effective ways of providing rip protection and damage limitation.*

#### RIP DETECTION SYSTEMS

The cost of replacing a steelcord belt, both in monetary terms as well as lost production, can have very serious consequences. On one sadly infamous occasion, an object as seemingly harmless and innocuous as a wooden broomstick became trapped at the conveyor head. It penetrated the belt and ripped four kilometres of steelcord belt from end to end.

Because of the huge variety of different specifications, steelcord belts are almost invariably made to order. A typical lead-time is generally 18 weeks or more. In an effort to minimize the amount of damage caused, a growing number of operators use rip detection monitoring systems.

Rip detectors work by using detection loops that are embedded at pre-determined intervals in the belt during the manufacturing process. A transmitter and receiver are positioned on the conveyor structure opposite each other on either side of the belt. This is usually behind the loading position to provide protection in the area where there is the greatest exposure to risk. Multiple detection



locations are also possible. The transmitter sends electro-magnetic signals to the receiver at regular intervals. When a signal is not received by the receiver, caused by a damaged detection loop for example, then an alarm is triggered or, depending on the type of system, the conveyor is automatically stopped.

Having the metal detection loops fitted during the manufacturing process is, of course, an additional expense and the detection systems themselves can also be quite costly. Even if the receiver is linked to the conveyor drive and automatically stops the belt when damage is being indicated, for optimum safety they should still be physically monitored. If someone is not able to quickly respond to an alarm then an enormous amount of damage can occur. In many cases, detection systems with an automated stop function can be over-sensitive and prone to raising false alarms. If this happens too frequently then there is a tendency for operators to simply over-ride the system.

#### USING BREAKER PLYS TO INCREASE RIP RESISTANCE

Breaker plies are designed to provide a significantly increased resistance against longitudinal ripping. Ultimately, the use of breakers is one of damage limitation. The breaker ply performs two functions — firstly it can help prevent the penetration of the belt by a foreign object. Secondly, the breaker ply acts as a barrier if an object does actually penetrate between the steel cords and starts to rip along the length of the belt. As with detection loops, breaker plies are embedded in the rubber covers during the manufacturing process. There

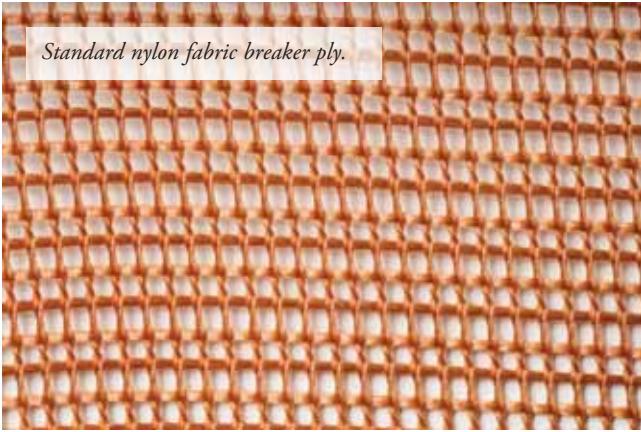
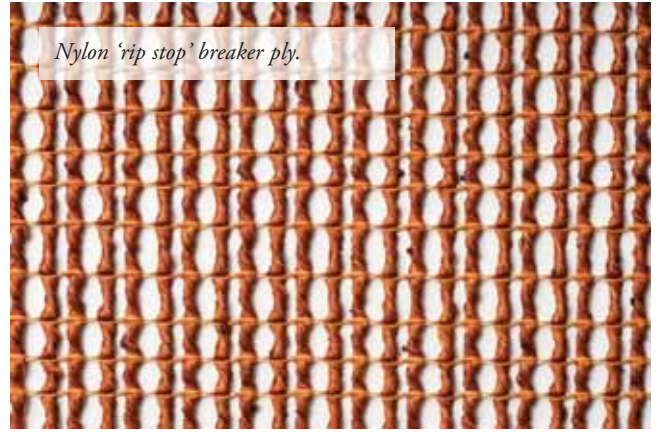
are numerous types and strengths of breaker used. The lighter weight versions are designed to simply absorb and dissipate energy whereas stronger, heavier weight breakers can actually stop the belt and limit the amount of damage even more effectively. These are commonly referred to as 'rip stop' breakers.

#### TYPES OF BREAKER

Breakers generally fall into two different categories or types — 'fabric breakers' (also referred to as textile breakers) and 'steel breakers'. Both types are usually embedded in the top cover above the steel cords over the full width and length of the belt, effectively creating a protective layer. It is also possible to have two breaker plies with one located above and the other positioned below the steel cords. However, having breaker plies in both the top and bottom covers can sometimes cause troughing problems in relatively narrow belts because of the increased cross rigidity.

A wide range of textile fabrics (mostly nylon) in various strengths and densities are used to make fabric breakers. Depending on the application and the type of material being conveyed, nylon fabric breakers often prove to be more effective than steel when it comes to actually minimizing the length of a rip. The reason for this is that the nylon strands are able to stretch. As the trapped object is being pulled through the belt the strands of the breaker stretch and gather together into a bundle that can eventually become strong enough to stop the belt.

Steel breaker plies consist of transversal

*Standard nylon fabric breaker ply.**Nylon 'rip stop' breaker ply.*

steel wires held in position by longitudinal binder wires. As with fabric breaker plies, there are a wide range of strengths based on the size and pitch of the steel wires. As I touched on earlier, although having a steel wire breaker would logically seem to imply a much greater strength compared to a fabric breaker ply, this is not necessarily the case. The steel breaker wires do not stretch so they cannot pull together to create a thicker barrier in the same way that fabric plies can. However, the advantage of a steel breaker is that very sharp trapped objects (dolerite rock or slate for example) do not cut through the steel wires as easily as they can through conventional nylon fabrics.

#### POSITIONING OF THE BREAKER PLY

There is often much debate about precisely where the breaker ply layer should be located in the top and bottom covers in relation to the steel cords. There is also a question as to whether or not the measurement of the thickness of the cover should include the thickness of the breaker. Fortunately, ISO 15236-1 (Steeltcord conveyor belts — Design, dimensions and mechanical requirements for conveyor belts for general use) provides a good explanation and also makes a pretty clear distinction between what should be technically considered as being a breaker ply and what should be regarded as conventional transversal belt reinforcement.

According to ISO 15236-1, a breaker ply should be positioned at a distance of between 1mm and 3mm from the longitudinal cords. The width of the breaker ply should be at least 10mm from the belt edge but no more than 100mm less than the width of the belt. On this basis the breaker ply is regarded as part of the cover, which means that the cover thickness is measured from the cords.

However, if the ply is less than 1mm distance from the longitudinal cords then it is considered to be a weft transversal

reinforcement and therefore part of the actual carcass. This means that the cover thickness is measured outwards from the surface of the ply.

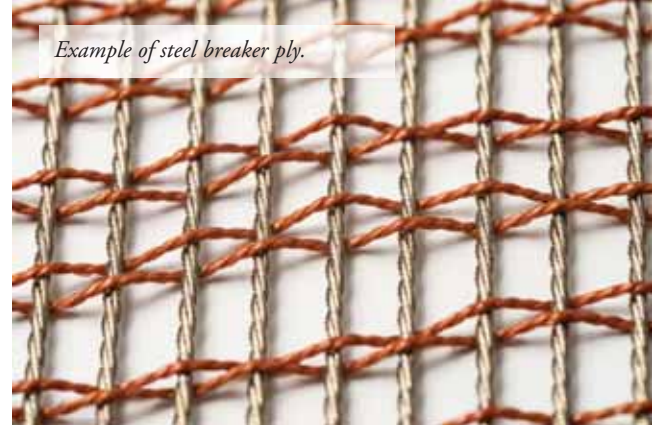
As far as steeltcord belts are concerned, the preference does seem to be to position the breaker as close to the actual steel cords as possible. Theoretically, this extends wear life because it maximizes the amount of rubber cover that would have to be worn away by abrasion before the breaker ply is reached.

#### CLEAR AND PRECISE BELT SPECIFICATIONS

One thing that is certain is that the buyer must provide specifications to potential suppliers that could not be subject to interpretation or misunderstanding. This especially includes whether or not the thickness of the breaker ply is included in the measurement of the thickness of the top cover. This is essential not only in terms of the anticipated operational lifetime of the belt but also, very importantly, it is needed to ensure that all potential suppliers are providing quotations based on exactly the same specifications.

#### USFLEX BREAKER

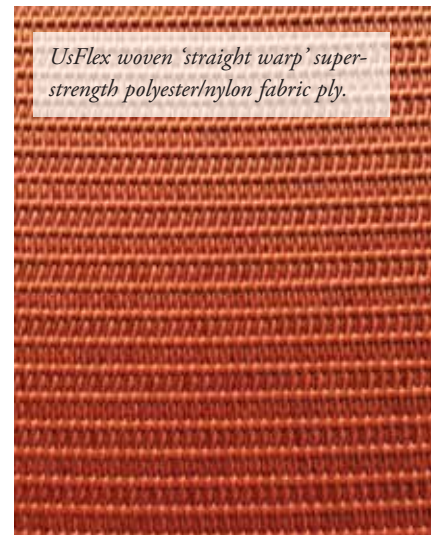
In addition to the conventional fabric and steel breaker plies there is also a third, very effective option available. Netherlands-based Dunlop Conveyor Belting also manufactures steeltcord belts constructed with a breaker ply comprising of a specially adapted version of its unique UsFlex woven 'straight-warp' polyester/nylon fabric ply. Because they have vastly superior rip, tear and impact resistance compared with conventional rubber multi-ply belts, Dunlop UsFlex single and two-ply belts have a long and very well established track record as a

*Example of steel breaker ply.*

'problem solver' belt used for particularly demanding conditions.

What creates these strengths is a very cleverly engineered ply construction that consists of extremely strong strands of polyester running longitudinally and heavy-duty nylon transverse strands held in position by a strong yarn. The strands are completely straight in both directions and are not interlocked in the conventional manner. Laboratory tests prove that the UsFlex fabric has a rip resistance that can quite easily be up to five times greater than conventional fabric ply material, making it a particularly effective breaker ply.

As with conventional breaker plies, the UsFlex fabric layer is embedded above the steel cords. This means that in addition to

*UsFlex woven 'straight warp' super-strength polyester/nylon fabric ply.*



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its enormous rip resistance it also provides extremely effective impact protection of the steel cords because the fabric dissipates the peak point of impact energy over a much wider area.

#### THE BEST OF BOTH WORLDS?

Some operators, including some of the biggest users of steel cord belting in the world, choose to have breakers and rip detection systems. The breakers are fitted in the top cover and the detection loops are fitted in the bottom cover below the cords. What is important to bear in mind is that because rip detection systems use electro-magnetic signals they cannot function if a steel breaker ply is fitted. So if you want to use an early warning detection system backed up by rip breakers to help minimize the amount of damage then it is only fabric breakers that can be used.

#### CHOOSING THE BEST TYPE OF BREAKER FOR YOU

Budget restraints aside, choosing the best type of breaker is similar to selecting the most appropriate belt specification because in both cases the single most important factor is the type of material being carried. As mentioned earlier, if the materials being conveyed are very sharp (slate, granite, dolerite etc) or simply may contain very sharp foreign objects (mining tools for example) then the best option is to use steel breakers.

If the materials are relatively blunt then fabric breakers are generally the best choice. In either case, if heavy materials such as large rocks are being dropped on to the belt surface then the choice of having a full UsFlex breaker-ply layer would, in my opinion, be the one to go for.

#### RUBBER MULTI-PLY BELTING

This guide is primarily intended for users of steelcord belts due to the propensity of steelcord belts to get ripped longitudinally by trapped objects. However, fabric and steel breakers can of course also be used in conventional rubber multi-ply belts. The main benefit of having a breaker ply in a multi-ply belt is that it increases the belt's impact resistance. If the working conditions are demanding and the belt is being used to convey heavy and/or sharp materials then it is much more economical in the long run to fit a fabric ply belt that has been specifically engineered for the purpose rather than use breakers.

#### MAKING THE BEST CHOICE

As is so often the case, choosing the most effective rip detection and rip damage limitation system is usually determined by the available budget. It is primarily a question of balancing actual bottom line costs against the very real risk of damage and potentially huge financial consequences that such damage can entail including replacing the belt and the loss of production. With steelcord belts often costing many tens of thousands of euros, those additional outlay costs need to be considered very carefully indeed. Obviously, I cannot

advise on budgetary matters but what I do believe is that it is better to have some form of 'insurance' rather than none at all. If your budget will stretch to it then having rip stop breakers will at least minimize the risk of steelcord heartbreak.



# Biomass cargoes need special handling

getting the right equipment for the job



*The Liebherr wheel loader L 550 is loading woodchips into railway carriages.*

Louise Dodds-Ely

## Two wheel loaders from Liebherr's range for less- and non-regulated markets handling biomass in Russia

Based on decades of experience in producing and developing wheel loaders, Liebherr offers a separate product range for less- and non-regulated countries. This range consists of five different models with an operating weight between 10,400 and 24,720 tonnes.

The Liebherr wheel loaders for less- and non-regulated countries fulfil the requirements of companies from the widest variety of sectors. For example, one field of application is the handling of various types of biomass such as logs and woodchips. Liebherr prepares its wheel loaders for the requirements of the customers in these sectors with an industrial lift arm and special attachments.

For high levels of productivity, Liebherr engineers put a high priority on reliability already in the research and development process of its wheel loaders.

For about two years, Mayr-Melnhof Holz Efimovskij, the Russian branch of the Austrian holding company Mayr-Melnhof Holz, has been working with two Liebherr wheel loaders in timber handling. The company is located 300km from St. Petersburg in north-west Russia. With a woodworking volume of approximately 650,000m<sup>3</sup> of dense timber per year, it is among the largest timber manufacturers in the region. Since the overall production had continuously been increasing, Mayr-Melnhof Holz Efimovskij was searching for

the most productive solution to handle its vast amounts of biomass.

### EFFICIENT HANDLING OF LOGS AND WOODCHIPS

Based on positive experiences with other machines from Liebherr, it turned out that the wheel loaders from Liebherr's product range for less- and non-regulated countries might be the right choice for the Russian subsidiary of Mayr-Melnhof Holz. As a result, the company decided in favour of one L 550 and one L 566 wheel loader from Liebherr. Both machines are equipped with an industrial lift arm, which Liebherr offers as alternative to its standard z-bar linkage without any

OVERVIEW OF LIEBHERR WHEEL LOADERS FOR LESS- AND NON-REGULATED MARKETS

Model	Tipping load (kg)	Standard bucket capacity (m <sup>3</sup> )	Operating weight (kg)	Engine output (kW/HP)
L 524	7,500	2.0	10,400	86 / 117
L 538	9,500	2.5	12,800	104 / 141
L 550	12,350	3.2	17,350	140 / 190
L 566	15,550	4.0	23,100	200 / 272
L 580	18,000	5.0	24,720	200 / 272

additional cost. The industrial lift arm boasts a parallel guide arrangement and especially high torque in the upper lifting range. This is the best solution for Mayr-Melnhof Holz because due to that design it is possible to handle heavy logs and to use large attachments such as high-dump buckets efficiently.

The smaller but powerful wheel loader L 550 is in use for loading woodchips into railway carriages and trucks with an 8.5m<sup>3</sup> high-dump bucket for lighter materials. The larger L 566, which only consumes around 13.5 litres of diesel per operating hour at Mayr-Melnhof Holz Efimovskij, loads logs into the receiving tank of a belt elevator at a height of 3.3m. The L 566 wheel loader works both with an 11.0m<sup>3</sup> high-dump bucket for lighter materials and with a 3.1m<sup>2</sup> log grapple, which is a hydraulic attachment for transporting logs. Thanks to the hydraulic quick coupler, it is possible to make fast attachment changes. The



*The wheel loader L 550 is equipped with the industrial lift arm designed by Liebherr engineers for industrial applications.*

operators of the two wheel loaders appreciate the smooth driveline and excellent manoeuvrability, even in conditions where space is limited. The

modern cabin of the Liebherr wheel loaders, including all-round visibility, creates an operating environment that further enhances working comfort.



*At Mayr-Melnhof Holz Efimovskij, the L 566 wheel loader consumes only 13.5 litres of diesel per operating hour.*

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# LIEBHERR

## Saving energy across the board with BEUMER pipe conveyors

*BEUMER Group supplied and installed a single-source solution based on the innovative pipe conveyor technology. (all photos: BEUMER Group GmbH & Co. KG)*



Cement manufacturer OYAK Denizli Çimento Sanayii T.A.S. relies on BEUMER Group pipe conveyors for environmentally safe and fast feed of alternative fuels.

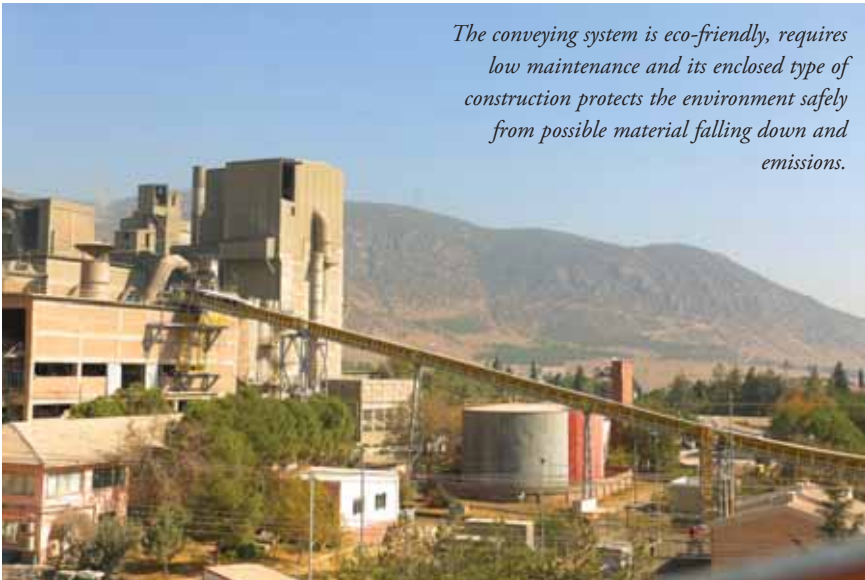
The manufacture of cement is particularly energy-intensive and to cement manufacturers energy efficiency is a very important factor. In order to ensure an economical and sustainable operation, the plant Denizli Çimento Sanayii T.A.S. of the cement manufacturer OYAK Group therefore opted for alternative fuels and raw materials to ignite the preheater, the

calciner and the main burner. Within the scope of this concept, Denizli Çimento decided to invest in an individual system from the AFR systems segment (alternative fuels and raw materials) from the BEUMER Group, which stores, mixes and conveys differently composed materials, such as shredded waste tyres. The core of this solution is represented by the two pipe conveyors used in this project. These completely enclosed conveying systems ensure an environmentally safe, dust-free and low-energy transport of fuels and raw

materials requiring — and this is the most important factor — a minimum level of personnel. This AFR system of BEUMER, investment of the plant Denizli Çimento, has been running since January 2017 and has proved to be a particularly efficient and economical solution.

The Turkish cement market is booming. From the third international airport in Istanbul, to the motorway between Istanbul and Izmir and many other large infrastructure, urban redevelopment and residential construction projects; the need for this building material is immense and is expected to grow continuously in the years to come. Manufacturers like the OYAK Group will obviously have a large share in implementing these infrastructure projects. This important cement manufacturer Denizli Çimento Sanayii T.A.S. is located in West Anatolia in the Aegean and is a subsidiary of OYAK Group.

*The conveying system is eco-friendly, requires low maintenance and its enclosed type of construction protects the environment safely from possible material falling down and emissions.*

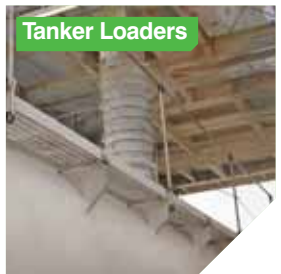
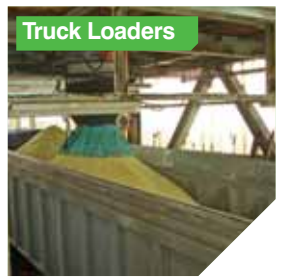
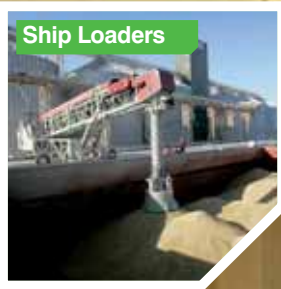


### SECONDARY INSTEAD OF PRIMARY FUELS

For the successful production of cement, the manufacturer puts a particular focus on the cost effectiveness of the process. “Our industry has always been energy-intensive,” says Berkan Fidan, deputy factory manager at OYAK Denizli Çimento Sanayii. “But it is also a factor that can be adjusted.” In 2015, the company representatives came

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*The pipe conveyor transports the alternative fuels from the storehouse to the preheater.*



together and decided to produce more efficiently and sustainably in order to minimize the use of expensive primary fuels such as coal, gas and oil. The aim was to gain a large part of the necessary energy needed from alternative fuels. These materials comprise differently composed fuels for the calciner and the main burner, the so-called residue-derived fuels (RDF), as well as shredded waste tyres whose size usually does not exceed 120 x 120 mm.

The operation's existing plants had not been designed for this. "We needed a partner who supplies and installs a single-source solution. The different materials are to be stored, mixed and conveyed to the preheater tower and the main burner within this system," explains GÜNGÖR AYDIN, project manager at Denizli. In his search, the cement manufacturer looked to

BEUMER Group. "In the past, the system supplier BEUMER had installed a bucket elevator in the plant for a different project," he said. "We are very satisfied with it and have made only good experience so far."

The contract was signed only one month after BEUMER Group had received the customer's inquiry in October 2015.

#### IDEAL SOLUTION FOR EACH CASE

In order to support producers of cement in the alternative fuels and raw materials field, BEUMER Group has developed a complete business segment dedicated to AFR systems. "Our know-how and our tailor-made systems permit us to offer optimum support to our customers," says Michal HRALA, Managing Director at BEUMER Group Czech Republic. "We have years of experience and we always consider our

customers' specifications". As a system provider, you have to be able to supply and install the entire chain from acceptance and unloading of the delivery vehicle, to the storing, conveying and feeding process of the solid alternative fuels for the specific user. A single source can supply the entire system to the end customer who therefore only needs one contact like BEUMER.

"We evaluated different variants of mechanical transport systems," remembers FIDAN. In the end, OYAK DENİZLİ opted for a single-source solution from BEUMER Group based on the innovative pipe conveyor technology. In May 2016, CTN MAKINA, a supplier approved by BEUMER, manufactured all of the steel components for the system and started assembling both the imported components and those manufactured on site. BEUMER Group

*With its ability to navigate horizontal and vertical curves, the conveyor can be optimally adapted to the terrain.*





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*The second line transports fuels to the main burner.*

installed two conveyors, 206 and 190 metres long, as well as the corresponding equipment for the two lines. Each pipe conveyor reaches a capacity of 15 tonnes per hour. “This conveying technology is not only eco-friendly but requires low maintenance,” says Hrala. “Its enclosed type of construction protects the environment safely from material falling down and from emissions. Another advantage is the lack of dust development on the running line”. With its ability to navigate horizontal and vertical curves, the pipe conveyor can be optimally adapted to the terrain. In comparison to other belt conveyors, the number of required transfer towers is considerably lower. This allows for substantial capital cost savings for the customer and BEUMER Group can customize the system to the individual routing.

The specialists from BEUMER Group also took care of the project planning of the storehouse and the required equipment as well as numerous conveyors and supply lines. BEUMER also handled the supply of mechanical equipment and the steel structure, the assembly and commissioning. On top of that, BEUMER Group installed two containers with discharge devices in front of each pipe conveyor ensuring an optimum mixture of the fuels. A container for distribution is also installed at the end of each conveyor.

#### **EFFICIENT SINGLE-SOURCE SYSTEM**

The delivery of the RDF material is carried

out in moving-floor trailers. The alternative fuels are unloaded and stored at the receiving station. All four containers for arriving material are fed with material from the storehouse by a grab crane. The different fuels are then burnt in the calciner and the main burner of the kiln.

“However, during the constructive dimensioning of this system we were faced with a particular challenge,” remembers Hrala. “Since the cement plant is located in an earthquake-prone area, we had to develop the system accordingly.” That means: The design of the pipe conveyor ensures that the conveyors withstand not only the dynamic load of an earthquake but also the repercussions. The existing preheater towers represented another hurdle. As they only offered little space, the BEUMER Group employees adapted the required equipment to the narrow conditions.

In October 2016, barely one year after the contract was signed, the commissioning of the system took place. “We are very satisfied with

the single-source system of BEUMER Group,” Güngör Aydın, project manager at Denizli, sums up. All transport systems supplied and the accompanying equipment are intertwined to ensure steady fuel feeding. “Not only do we save costs by requiring a smaller amount of expensive primary fuels, we also work much more energy-efficiently,” he declares. “This means that our capital costs will have paid for themselves in a short amount of time.”



*Two successive conveyors, 206 and 190 metres long, are used. Each pipe conveyor reaches a capacity of 15tph.*

## WeatherSolve: keeping control of dust emissions during biomass handling

Storing and processing biomass can be a dusty business. The material is generally very light so it is easily blown by the wind. Using wind fences to keep the material on the stockpile is good for the neighbours and good for the viability of the business.

At one eighth of the weight of water, bagasse is one of the lightest types of biomass so a solution that works for bagasse is a solution for many biomass situations.

This is the story of a bagasse stockpile. Even with a 30ft high earth berm all around a 10-acre pile of bagasse stored to 30ft deep, neighbours were complaining. As a responsible environmentalist, the company considered a number of strategies to reduce the dust.

- ❖ Keeping the pile low. This was not possible as all the storage space was required.
- ❖ Wetting down the pile. Apart from the huge amount of water and run-off challenges, excessive water also would add to the handling weight and reduce the efficiency of the burners.
- ❖ Foams and other spray-on surface



coatings. These were not practical because of the annual cost and the frequency of turnover. There were also concerns over what would happen in hurricane-strength winds.

- ❖ Localized protection of the conveyor area. This had some benefits, but a large

part of the dust came from erosion off the surface of the pile.

Instead, a wind fence by WeatherSolve Structures (design and build) was chosen. The size and aerodynamic porosity of the fence was chosen with the assistance of a Computational Fluid Dynamics (CFD) analysis by the Midwest Research Institute — a specialist group based in Kansas City. The analysis was made in conjunction with WeatherSolve. It showed a dust control level of 86% when a mixture of fences 12ft, 36ft and 48ft above the berm were employed. Aerodynamic porosities were a combination of 47% and 34% panels.

The support system was designed by WeatherSolve using precast concrete pads attached to a steel frame and buried in the berm. The frames were spaced at up to 90ft spacings to minimize earthworks.

The cladding system used WeatherSolve's proprietary panel system that has fabric panels attached to horizontal cables with stress-rated clips to ensure the structure is not over-loaded in a hurricane. Ironically the system was hit with a hurricane less than a year after construction was completed. No poles were damaged and a few fabric panels released along one edge so the fence was quickly returned to its normal operating state.

More importantly, the neighbours and the company appreciate the new fence because the bagasse is staying on the pile.



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## Resolving particle build-up in a bagasse-fuelled gas generator



*Silica particles collected at the first duct curve, where they liquefied and accumulated at the base of the duct.*

The shift from burning fossil fuels to biomass has presented cost savings for many companies, writes *Rodrigo Trevenzoli, Brazil Sales Manager at Martin Engineering*. A prime example is the change by the world's largest orange juice producer to using a sugarcane bagasse hot gas generator or 'gerador de gás quente' (GGQ) in Portuguese, for the production of citric pulp pellets. Beyond producing orange

juice and oil extracts for flavouring, Citrosuco — based in Catanduva, Brazil — is also one of the largest producers of citric pellet animal feed. The substance is a cereal substitute in sheep and cow feeds, highly regarded for its caloric content and good digestibility.

The move was not without its challenges, however. The company's switch from Brazilian petroleum fuel (BPF) oil to

sugarcane bagasse was accompanied by an unpredictable repercussion that threatened to offset the financial benefit — excessive silica particle buildup in ductwork slowing production and posing a potential hazard to the area and to workers.

The problem began with the soil in which the sugar cane is grown. Bagasse is a dense pellet made from the leftover dried husk of sugar cane, which produces enough heat to be considered a viable source for energy generation. Sugar cane in Brazil is grown in soil with high silica content, and some of it mixes with the fibrous waste during harvesting, becoming part of the bagasse pellet. Once burned in a GGQ, the silica particulates are too heavy for the pressurized heat flow to carry them through the entire process, causing them to separate and accumulate in the ductwork, seriously impacting production.

"Citrosuco has a short annual harvest schedule of only seven months, due to the orange season, which requires 24-hour production to fulfill demand," explained Rafael Torres Junqueira, Flow Aid Product Specialist for Martin Engineering Brazil. "The silica buildup issue required ten days for cleanup, forcing them to burn expensive



*The silica clogged the duct 90%, causing intense pressure to build within the system.*

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*The cannons were set to fire in quick succession to promote consistent flow through the system.*

BPF oil during the remediation process, seriously effecting revenue.”

### **BUILD-UP TO TROUBLE**

Citrus feed pellets are derived from the leftover peel, rag (fibrous material and pulp) and seeds of the juice-making process. The mixture is pulped and pressed under high pressure to reduce the moisture, then transferred to giant rotating drums heated by the GGQ. The dried meal is compressed in an extruder to form cylindrical pellets.

“Over our production period we’ll burn about 420 tonnes of bagasse per day for the process,” said Leonardo César Bolato, Senior Project Engineer for Citrosuco. “The dosage of bagasse for firing is controlled according to the demand for heat by the process dryers.”

When bagasse is burned, fly ash and silica particulates travel through an inverted U-shaped duct configuration. The heat is blown into the process dryers, pulling the moisture from the citrus residue. Although the fly ash travelled properly to collection points, Citrosuco operators found that the dry silica particles collected at the roof of the first duct curve and, after being exposed to extreme temperatures for long periods, liquefied and accumulated at the

base of the duct.

The liquefied silica clogged the duct 90%, causing intense pressure to build within the system and posing an explosion risk. This required the operation to be switched to burning BPF oil instead, the cost of which is more than 14 times that of bagasse.

To clear the obstruction, the bagasse incinerator had to lay dormant for four days as the molten silica cooled and hardened. Workers would then enter the duct through a trap door, wearing specialized heat reflecting suits that allowed them to chip away the hard mass with pneumatic hammers. This process took roughly four days because workers could only spend a limited amount of time in the duct. As they hammered closer to the core of the mass and exposed more molten silica, the heat forced crew members to rotate shifts to maintain a safe environment.

Counting the period needed to heat the system back to peak efficiency, the amount of downtime was approximately one and a half months out of the company’s seven-month window. Citrosuco executives realized that — beyond the cost — it was becoming a serious workplace safety issue. After the first season, operators and

executives began searching for an answer.

### **SEEKING NEW SOLUTIONS**

Company representatives visited several cement production facilities with similar needs for their calcination process, which requires intense heat passed through huge rotary kilns. The team found that nearly all of the facilities they visited successfully utilized Martin® Air Cannons. Though the cannons were in place to direct the flow of fly ash, the research team speculated as to whether the concept could be adapted to Citrosuco’s GGQ silica issue, so they reached out to Martin Engineering Brazil.

“When I heard their needs, I realized that this was probably the first time that an air cannon had been used for such an application,” remarked Junqueira. “I contacted our flow aid products expert, Brad Pronschinske, because we had never exposed our equipment to this type of application before. We were very excited to be able to tackle this unique problem.”

The Martin Engineering team examined the operation of the GGQ and realized that the silica particulates, though heavier, only became liquid after they had settled. They theorized that if the particles could be kept flowing through the system with the fly ash, the silica would naturally come





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to rest in designated collection areas.

A plan was formulated that included a combination of twelve 70-litre and 150-litre Martin® Typhoon Air Cannons. “We positioned them in a staggered pattern along the horizontal duct,” explained Brad Pronschinske, Global Product Manager of Flow Aid Products for Martin Engineering. “The cannons were set to fire one after another in quick succession, starting at the elbow, to promote the constant and consistent flow of particles and gas through the system.”

The hybrid design of the Typhoon Air Cannon offers an improvement on negative pressure firing systems by combining the simple one-line plumbing of traditional valve design with the power, efficiency and easy maintenance of an advanced internal valve. Supplying more force output with less air consumption than traditional air cannons, the complete valve assembly can be removed in one easy step and replaced within minutes, working from one side of the tank, eliminating the need to ever remove the tank from the vessel for service.

“The entire process, from initial design and finalization of drawings for subsequent approval, lasted about three months,” Bolato continued. “The installation of air cannons and all necessary infrastructure required two months during the off season,

with a staff of 25 contractors and six Citrosuco workers.”

## RESULTS

“Since it was a pioneering application, we had an apprenticeship with the air cannons at the beginning,” Bolato recalled. “We had no frame of reference for the optimum sequence, so we gradually adjusted the timing, firing the cannons in progressively more intense operating conditions. Today, the air cannons operate with the maximum number of shots allowed,” he said. “After the last cannon fires, there is only one minute of lag time until all reservoir vessels reach the 7.0BAR (101PSI) of pressure needed to discharge again.”

The schedule is maintained 24 hours per day throughout Citrosuco’s entire production window. Halfway through their third season of use, operators have reported no unscheduled downtime, no need to use fuel oil and only minimal post-season silica buildup since the conclusion of the project. “It took a lot of courage on the part of Citrosuco’s senior management to trust that we would come up with a solution that, to my understanding, had never been done before,” said Junqueira.

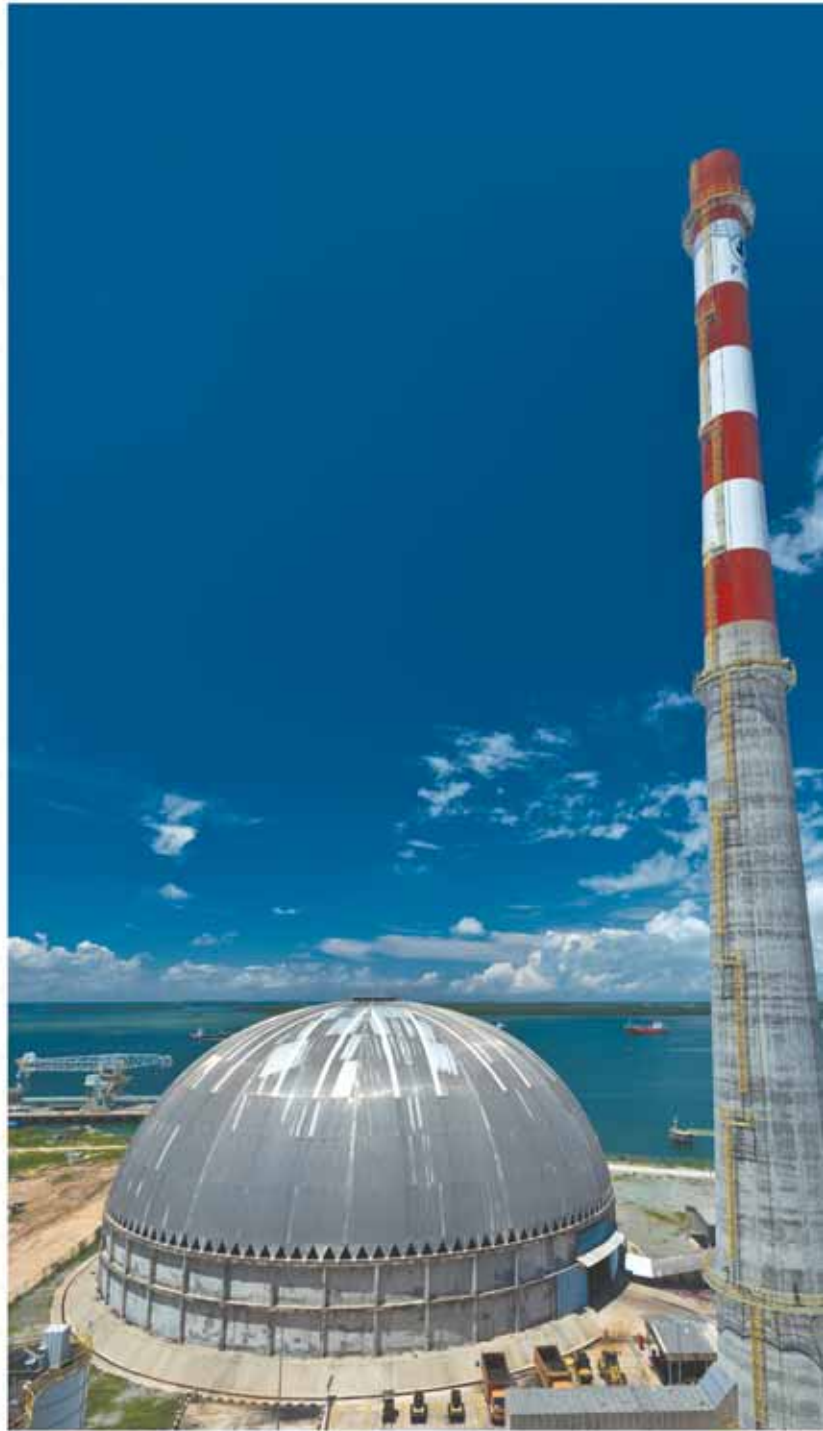
According to Bolato, “The main benefit of this project — in addition to ensuring more stable production and safer

conditions in which to operate and maintain equipment — was ratifying a spirit of trust. We worked as a team with the experience and contribution of all stakeholders in their respective specialties. By doing so, we got the results we expected from the project’s inception.”

Martin Engineering is a global innovator in the bulk material handling industry, developing new solutions to common problems and participating in industry organizations to improve safety and productivity. The company’s series of Foundations books is an internationally-recognized resource for safety, maintenance and operations training — with more than 20,000 print copies in circulation around the world. The entire 500+ page volumes can also be downloaded as free PDFs from the Martin web site. Martin employees take an active part in ASME, SME, VDI, CMA and CEMA, and the firm played a pivotal role in writing and producing the 7th edition of the CEMA reference book, *Belt Conveyors for Bulk Materials*. Martin Engineering products, sales, service and training are available from 18 Martin facilities, including factory-owned business units in Australia, Brazil, China, Colombia, France, Germany, India, Indonesia, Italy, Mexico, Peru, Russia, Spain, South Africa, Turkey, the USA and UK.



*Pneumatic panels contain the solenoid valves which receive a signal from the PLC to fire the air cannons.*



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## STEMM grabs ensure complete filling and efficient operation



The port terminal of Auhafen Muttenz Basel (Switzerland) has just started using a completely new system for unloading its biomass cargoes and storing the commodity in large silos. Grab company STEMM has been heavily involved in this project.

STEMM's 4CH-16000-1,1 type clamshell grabs, with a capacity of 16m<sup>3</sup>, are designed to handle all kinds of bulk commodities and biomass, up to a density of 1.1 T/m<sup>3</sup>.

The start-up of the installation has been carried out by STEMM's technical team in collaboration with the engineers from STEPHAN, a Swiss company from Freiburg which specializes in all types of lifting

equipment, bridge cranes and special equipment for combustion of wood and biomass sectors, wood burners and boilers feed, silos, and so forth.

In the last few years, the volume of biomass cargoes moving along the Rhine and other big European rivers has considerably increased. Biomass is so popular today that its consumption and production is on the rise in all developed countries.

Several techniques and processes have been used in handling these cargoes. Especially popular is the movement of biomass in river vessels, and the use of high — and high-capacity — silos. Efficient

operations require the use of modern equipment, components and up-to-date expertise, combined with modern technology and experience.

For the Swiss project mentioned above, Spanish company STEMM installed an electrohydraulic clamshell grab powered by four hydraulic double-acting cylinders, that work directly on the grab's shells, applying a very powerful, uniform and constant penetration strength.

The stroke of the shells uses very special kinematics which ensures complete filling, especially when handling this type of material which is sometimes extremely irregular in shape and grain size.





These grabs can work in any position within the ship, even with sloping working positions, including working in almost a horizontal position.

STEMM's grabs work 24/7, and intermittently transmit signals to the automation system, including information

on position of the valves, closed or open, incline, operation pressure, temperatures of oil and electric motor, and more.

For boats carrying very compacted materials, due to their hold conditions or weather circumstances, STEMM grabs have

their own system called 'scratching' which operates automatically and performs a previous and/or simultaneous scratch when handling the product inside of the hold. In this way, they can ensure much more complete filling than possible with some other clamshell grabs.

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## Weighing in on biomass handling with Control Systems Technology Pty Ltd

Control Systems Technology Pty Ltd (CST) is an Australian manufacturing company founded in 1984 in response to an industry need for accurate, reliable and durable in-motion weighing equipment.

The company got its start working within the mining industry in remote areas such as Tom Price and Port Hedland. Its focus on the development of high-accuracy weighing technology has been particularly critical for those working with high value material.

In recent years CST has worked with many companies supplying weigh frames, weighbridges, railcar and truck load-out systems.

Both in Australia and abroad, CST supplies to a range of industries from mining and biomass to manufacturing and light industry such as dog food, mushroom compost.

### BIG IN BIOMASS

Being intricately tied to the energy industry in Australia, CST has become increasingly involved with the burgeoning use of biomass in energy production. CST has sold weighers to the Rocky Point Power Station in Woongoolba, near Beenleigh, Queensland. The power plant uses crushed sugar cane mulch and other biomass materials to generate renewable electricity and supply process steam to the Rocky Point Sugar Mill.

More recently CST weigh frames were installed at Lynemouth power station in Ashington in the UK, which burns wood pellets to create low-carbon electricity to residential homes. As the market shifts towards the future of biomass, the need for high-accuracy weighers remains paramount. Adaptable to the changing nature of industry, CST remains passionate about supplying the high accuracy required for



excellence in all areas.

### TECHNOLOGICAL DEVELOPMENTS

Able to apply its expertise to a wide range of company needs, CST products focus on its intellectual strengths in weighing.

CST is a true entrepreneur, always looking to fulfil technological industry needs, and recently launched its revolutionary new IntelliRoll®, that is set to change the face of belt weighing.

The new IntelliRoll® recently won an award for 'Best Product Launch' during the Queensland Mining Awards 2018.

IntelliRoll® is an autonomous, remotely accessible, plug-and-play weigh roll which can be configured as a process belt weigher.

The IntelliRoll® allows belt weighing without wiring, without a PLC, and without need for a weigh bridge.

The IntelliRoll® can be used singularly or in an array to work seamlessly with the new standard of IIoT (Industrial Internet of Things\*) technology.

The IntelliRoll® creates the opportunity for accuracy in weighing and monitoring where limitations of space, power supply and money have inhibited companies from installing weighing devices in the past. Its suitability for fast installation lowers OH&S risks and site shutdown times.

The ease with which it can be recommissioned in different locations makes it ideal for use in the initial design

\*The industrial internet of things, or IIoT, is the use of internet of things technologies to enhance manufacturing and industrial processes. Also known as the industrial internet or Industrie 4.0, IIoT incorporates machine learning and big data technologies to harness the sensor data, machine-to-machine (M2M) communication and automation technologies that have existed in industrial settings for years.



phase of new plants and factories.

The IntelliRoll® is able to work in synergy with existing equipment allowing for in-motion checks of both weighing and feeding systems. The IntelliRoll® is rapidly gaining momentum as both light and heavy industry recognize the potential of the IntelliRoll® to improving their process

systems.

Elf-Farms near Windsor, NSW, Australia recently had IntelliRoll® installed in its cassette conveyor. The system represents a critical measure to monitor mushroom spore quantities in the production of their mushroom compost.

Enquiries from farmers who considered

IntelliRoll® as possibly able to help improve farming practices shows it is a product that has captured the imagination of Australian industry. Our technological future will require change from all sectors and a forward thinking, ambitious approach. CST embraces the challenge and potential of these emerging markets.

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# RIGA: fast bulking of renewable energy



## THE OPPORTUNITY

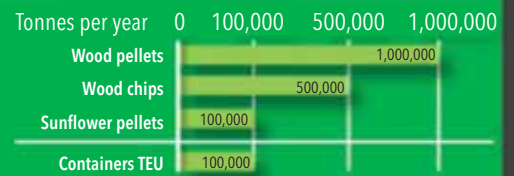
Renewable energy, generated by replenishable resources, like biomass (a by-product of organic material), is becoming a key power source for heavy industries such as mining. The global increase in demand for this power source is down to its low production costs, environmental and regulatory incentive, and if managed properly, a very stable source of clean energy supply. These benefits are very important, as in some industries the cost of energy to produce a product or deliver a service is between 10–30% in many cases in determining failure or success.

The transition from traditional energy sources, such as fossil fuel to renewable resources, opens up interesting opportunities for ports, which are finding creative and effective ways to transport, store and load renewable bulk materials, such as biomass into bulk ships for export.

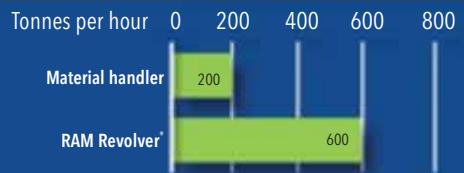
Riga Universal Terminal (RUT), part of the Portek Group in Latvia, wanted to expand its biomass logistics to a more efficient and environmentally safe operation. After serious considerations of

## Facts about cargo handling by RUT

### CARGO handled

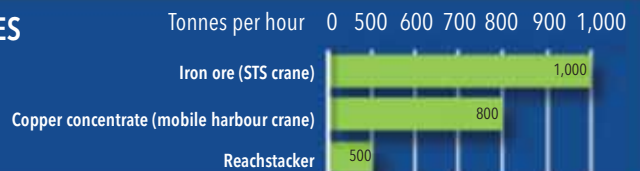


### MATERIAL HANDLER comparison



## Facts about Revolver® loading rates

### LOADING RATES RAM Revolver®







other solutions — and looking beyond the traditional way of bulk handling — it decided on a fairly new, but successful integrated system, called ‘Containerized Bulk Handling’ (CBH) to handle its biomass wood pellets.

**THE SOLUTION**

Biomass is filled in open top containers at source, or from a shed or stockpile in the port, and taken right to the dock. A rotating spreader hooked to an existing crane then picks up the container and takes it into the ship’s hold, where the rotating spreader rotates the container through 360° tipping out the biomass. This operation significantly mitigates environmental issues, such as dust pollution and loss of material. This is a winning solution, right from exporter, the port and the environment.



Terminals which do not have a traditional bulk handling infrastructure or expensive warehouses, conveyor belts and shiploaders, can now use this simple but complete holistic approach to accommodate any type of dried bulk using existing equipment at the port. The open top container is used as a means of transport, storage and loading facility, in conjunction with the rotating spreader.

Through CBH, Portek’s innovating management has taken the multi-purpose terminal to new heights of added-value services for its containers, breakbulk, timber and other types of bulk material operations.

**THE NUMBER**

RUT had the option of considering the purchase of a conventional material handler worth €1.3 million, on top of other complimentary equipment, with significantly increased the total operational price. This conventional material handler option provided for a maximum biomass loading rate of 200tph (tonnes per hour).

With the assistance of its Liebherr service and agent partners, RUT included the option of using a rotating spreader called ‘RAM Revolver’ for Containerized Bulk Handling, which rotates the 45-tonne-capacity container inside the bulk vessel’s hold. With a small investment for the rotating spreader, RUT now has higher loading rates, higher annual tonnage and higher profits. This RAM Revolver option provided for a biomass loading rate of up to 600tph. Normal containerized bulk handling cycles per hour on a mobile

## Containerised Bulk Handling

with RAM Revolver®

# The revolutionary bulk handling system

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harbour cranes are between 20 to 25 cycles.

**THE FUTURE**

Although the CBH system, which handles all types of bulk material, is fully operational in many countries — from Australia all the way to Africa, the Americas and the Caribbean — RUT has deployed the very first CBH operation in Europe for the export of biomass. It has therefore set a new benchmark in the bulk handling industry, that is more efficient, environmentally safe and a fast deployment time; all with lower investment than most traditional systems.

Global, regional and also local port operators can now take advantage of the existing traffic of millions of tonnes of

bulks that are available in their own hinterland, without having to invest in new expensive and complex traditional systems such as warehouses, conveyor belts and shiploaders. Everything they need, they already have; with the exception of a



rotating spreader, which is usually procured by the port, and the right number of containers, which are usually bought or leased by the exporter or logistics provider.

Bulk exporters will no longer have to

transport their product a long way to a port with warehouse facilities, whilst a local multipurpose terminal, with or without harbour cranes, can do the job more efficiently with a total lower cost for everyone.

**Engineering solutions for biomass storage and handling**

Biomass is a general term used to describe a variety of materials including wood chips, pellets, saw dust, milled switch grass, corn stover, etc. From a material storage and handling perspective, these materials can exhibit various handling challenges. Materials such as milled corn stover are very light and may experience discharge issues, whereas materials such as woodchips exhibit strong interlocking tendencies. Pellets may undergo attrition and generate dust, which can pose an explosion hazard. Whether it is gravity-reclaim stockpiles, silos or feed hoppers, unless properly designed, they can experience flow problems such as flow stoppages, limited live storage capacity, feed rate limitation, etc. Similarly, if the feeder and transfer chutes are not designed properly, they can result in flow problems. These problems can be avoided by properly designing or retrofitting the storage and handling systems.

Established in 1966, Jenike & Johanson is a world-renowned technology company which provides solutions for reliable storage and handling of bulk solids.

Problems Jenike & Johanson solves/avoids include:



- ❖ flow stoppages or erratic flow due to arching and ratholing in silos and feed hoppers;
- ❖ limited live storage capacity in silos and gravity reclaim stockpiles;
- ❖ feeder discharge issues;
- ❖ chute pluggages;
- ❖ attrition and dust generation during pellet handling; and
- ❖ solids handling equipment failure investigations.

While Jenike & Johanson solves these type of problems for various industries, these problems are quite common in the biomass industry. During processing of biomass, handling problems are often the major cause of costly downtime and demurrage



charges for many facilities, especially during startup! These same flow problems continue plaguing on-going operations by limiting throughput and creating safety and health risks, as well as reducing equipment life, increasing maintenance costs and causing premature equipment failure.

To understand why these flow problems are so common for biomass, lets compare biomass to bulk materials/powders. Both bulk materials and biomass have internal friction, can form piles, are sensitive to pressure, and are compressible. In addition, biomass can be springy, and the particles have a high aspect ratio.

With biomass materials, common issues



are bridging over large spans (sometimes even up in the cylinder of a silo) and ratholing — resulting in limited live capacity, fermenting in stagnant regions, and potentially spontaneous combustion. The flow characteristics of biomass can change when material sits in a bin even for a short time. To measure the flowability of biomass, large-scale tests need to be run. Without that, you don't have a basis that can provide high confidence for the design of bins, hoppers, feeders, and transfer chutes. It is also critical that the tests match process conditions such as moisture content, particle size, and time at rest.

Bulk solids handling equipment design should not be a trial-and-error approach; engineers should not guess at material properties, they should measure them! Jenike & Johanson one of the largest and most complete laboratories in the world for characterizing the flow properties of

biomass as well as other bulk solids under representative environmental conditions. For over 50 years, Jenike & Johanson has focused on developing first principle theories on bulk solids flow and conveying behaviour. To address the costly flow problems that are associated with biomass, Jenike & Johanson has developed proven ways to characterize biomass materials and to design handling equipment that will promote reliable, smooth and unrestricted flow.

Jenike & Johanson's services for biomass

industry include:

- ❖ biomass flowability study;
- ❖ silo, hopper and stockpile gravity-reclaim system design;
- ❖ feeder design;
- ❖ transfer chute design;
- ❖ calculation of material flow induced loads on silo and hopper walls; and
- ❖ training on solids flow and pneumatic transport.

Jenike & Johanson combines test results and real world project experience, which yields the best solution in terms of reliability and cost-effectiveness. It has worked on biomass projects handling sawdust, wood powder, wood chips, bark,



municipal solids wastes, forest residues, sorghum, seed and hulls, chopped straw, switch grasses, and corn stover.

The company's skilled and experienced engineers provide a very detailed structural and mechanical design of solids handling equipment, and routinely design silos, hoppers, feeders and transfer chutes.

#### LATEST DEVELOPMENTS AND CONTRACTS

Jenike & Johanson is working as the bulk solids handling expert for a major project developing a conversion process to convert forest and mill residue to ASTM-approved drop-in jet, diesel, and naphtha fuels that are cost-competitive with conventional fuels.

The complex and variable characteristics of forest and mill residue are expected to pose a challenge to the material handling and feed systems. Thus, Jenike & Johanson is providing material flowability testing and engineering to develop and validate computational simulations of the biomass feedstock flow through the front-end system.



## Mideco's Burnley® Baffles keeps biomass handling dust under control

Mideco is an Australian-owned company that specializes in dust control products and solutions for ports unloading facilities, grain processing sites, mines, quarries and any commercial environment.

In Australia Mideco has been a recommended supplier of industrial and commercial dust extraction systems for the past 60 years. The company's extensive range of award-winning products and innovative dust solutions, such as Bat Booth™ and Burnley® Baffles, have been proven to deliver strong results in a vast range of applications both locally and overseas.

The dust is generated at various stages of biomass handling, creating hazardous working conditions and affecting workers' health. Mideco's Burnley® Baffles helps significantly reduce the amount of biomass related dust.

This system is Mideco's internationally patented dust suppression device specifically designed to reduce the escape of dust from dump hoppers and chutes handling dry granular bulk raw materials such as grains and ores. It's a well-established product with hundreds of applications in Australia and overseas. The units are currently installed at facilities in Canada, the US, Israel, Ukraine, New Zealand, China, UK and Ireland amongst others.



A Burnley® Baffle installation consists of a set of modules that fill the open inlet face of a hopper. Each module contains a set of blades that pivot to allow the material to





flow into the hopper. The dust generated from the material falling into the hopper cannot escape because the hopper is only open where the material is entering. When applied to a hopper alone Burnley® Baffles can eliminate up to 80% of dust. With an additional dust collector applied directly to a hopper 100% of dust can be eliminated.

The competitive advantage of Burnley® Baffles is hard to beat. It's easy to install, virtually maintenance free, can be customized to a hopper of any size and is available in various sizes to suit different types of dry granular bulk raw material. Installing Burnley® Baffles on site allows staff to continue working while the dry granular material is being unloaded. That means hundreds of shift hours saved in addition to improved air quality at the workplace.

There are five models available in total, depending on what dry granular material is involved. Baffle lengths and widths vary between models and specific applications. Depths are pre-set depending on the application and therefore the model. The most common application is

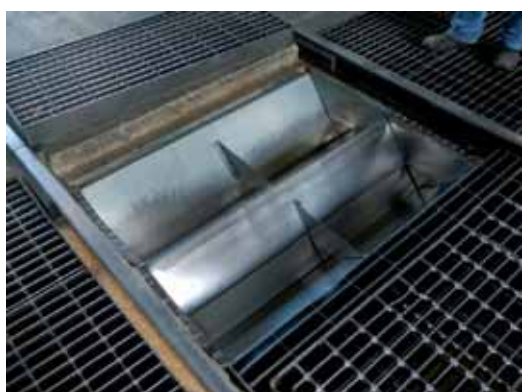


grain, however Mideco's Burnley® Baffles have been assisting with dust suppression during glass manufacturing, installed at a quartz plant, used for fertilizer and sand applications, and biomass.

### BIOMASS APPLICATION

Just last year Mideco was requested to provide a dust suppression solution for a biomass project — a wood pellet hopper in Port Authority in Panama city, Florida, USA. A significant amount of dust was generated during the rail dump delivery of wood pellets into the hopper, putting staff's health at risk and causing delays. In co-operation with its US agent CEG, Mideco recommended and successfully installed Burnley® Baffles Model 2 for this project.

Mideco's environmental technologies can help businesses solve any biomass dust-related problems while taking care of the most precious resource — people.



## Avoiding biomass dust problems with solutions from the Raring Corporation

The term 'biomass' encompasses a wide concept, and probably depends whom you ask or where you look to get a definition, writes *Gonzalo Campos Canessa, CEO of TRC (the Raring Corporation)*. Biomass can be anything from wood logs to wood by-products, agricultural 'waste' or even poultry litter.

We normally think of biomass as a source of energy and the local codes and standards will make the call as to what you are allowed to burn to produce energy in your house or at industrial facilities in different states or countries.

Biomass is well known as a source of heating, but it is also a source for steam production and also electricity. If we focused on biomass as a source of industrial energy, the amount of it being transported and handled is on a big scale, so the potential for dust generation during biomass material operations could be problematic. Even though the most common way to produce energy from biomass is to burn it, it is considered a renewable energy, because it is deemed to be carbon neutral by the UN. Because of its

relatively low weight and low heat content, transportation is an important part of the cost of this fuel, so there are big incentives to burn it close to the source, which limits the areas where biomass can be used.

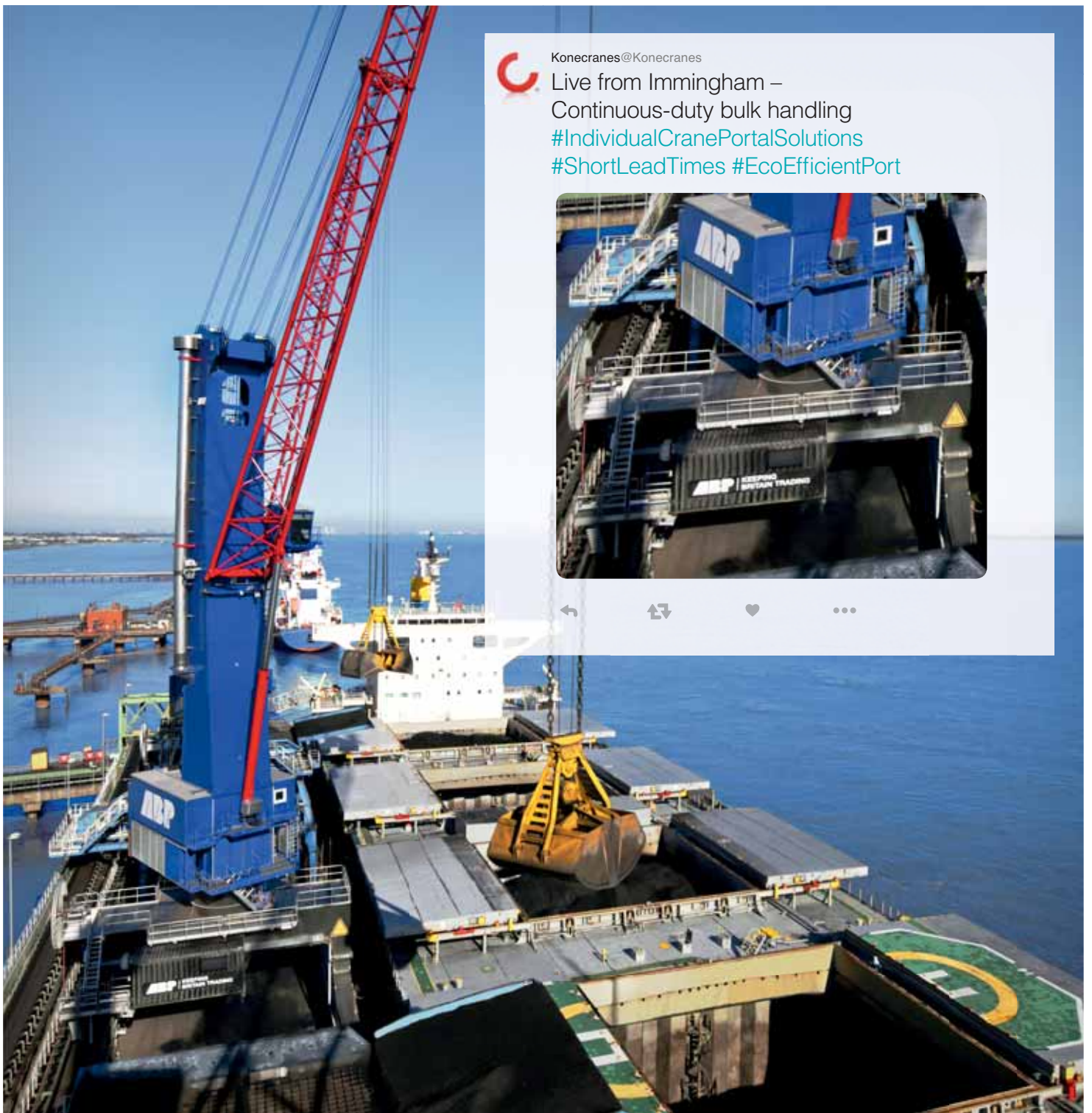
The Raring Corp Headquarters are located in Washington, the 'Evergreen State', so we are surrounded by saw, paper and pulp mills basically also located on the neighbouring states of Oregon, Idaho and the province of British Columbia. We have done projects on this vast area but most of the jobs are concentrated in BC Canada. As in other industries, the most problematic part of the material handling process are the truck dumps followed by front-end loader operations and stockpiles.



The heat content of the biomass depends on the moisture content, so it is not desirable to add much water to it. ADS™ Dry Fog is a good way to control dust during biomass handling. TRC dust suppression systems use a high-tech nozzle to break the water particles into a fog of extremely small droplets that are in the same size range as the airborne respirable dust. TRC FP nozzles use compressed air to transform water into the fog-sized droplets needed to project the ADS™ Dry Fog with adequate kinetic energy where it's needed and penetrate through opposing air flows.

Dust control is a combination of two elements, passive and active. The active

dust control systems is the ADS™ dust suppression system and the passive one corresponds to the isolated volumes to avoid external influences where dust is generated, allowing the active dust control system to work properly. We can design and supply a dust control system integrating our ADS™ Dry Fog and Windfences (passive dust control system) to suppress the dust at both truck and front-end loader dumps. For stockpiles, we have two options, build a Windfence around the pile or a combination of a windfence plus Yard Sprays (Water Spray System). This last option is less likely to happen since it will add moisture to the biomass but it could be implemented in some extreme cases.



## SEARCHING FOR GREATER BULK HANDLING PRODUCTIVITY?

Reach out and grab it with a Konecranes Gottwald Portal Harbor Crane. Take these two Model 8 four-rope grab cranes at ABP in Immingham, UK that handle coal, biomass and petcoke to supply power and industrial plants. They have customized, robust rail-mounted portals topped by proven mobile harbor crane technology and they're equipped to operate on-grid to maximize eco-efficiency.

Find out more about portal harbor cranes at [konecranes.com](https://www.konecranes.com)

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## Discover how dry bulk products to be transformed can be stored safely in a MegaDome® building



Storing dry bulk products that will be transformed, like biomass for example, can be extremely challenging. The building's construction site can be difficult to access, the installation needs to be quick, and the structure has to respect the building code of the location where it will be built. It requires a building that keeps the products dry and accessible year-long, while having a clear open space to maximize storage capacity, and to facilitate handling and the movement of heavy machinery.

MegaDome® fabric buildings designed by Harnois engineers provide a fast and cost-effective solution to all bulk storage needs. They are designed for the industrial, municipal and agricultural sectors to protect bulk products like minerals, coal, cereals, wood, salt and manure while keeping them dry and accessible all year long, even during winter. These buildings also help with inventory management by limiting loss of products.

### CONSTRUCTION CHALLENGES

The company's in-house engineering team designs buildings that can fit entirely in one container (or a couple of containers

depending on their size) allowing for efficient delivery and quick installation no matter where the construction site is located. The type of ground can have a major impact on the construction and costs. This is why the Harnois team has developed a wide range of foundations to adapt to all kinds of grounds, the most popular of which are concrete blocks that require very little excavation.

Harnois engineers design custom buildings that meet municipality standards and requirements. They also stamp plans, making it easier to get fast approval for almost any project. The designated expert on the project supports the client during the entire approval process, making sure all the right documents are available and presented.

### MEETING THE NEEDS OF BULK STORAGE

The innovative design of Harnois' MegaDome® buildings features no central column and large wall clearance, providing a large surface area for storage and an open space to facilitate the circulation of machinery. Harnois' in-house engineers can adapt the structure to specific loading

equipment and conveyors, like airtight openings for equipment that needs to go through the membrane.

The lower section of the arches, which is the most exposed to dirt and corrosive elements, is always hot dipped after welding to ensure the protection of the steel and the durability of the structure. The structure can also be hot dipped for extra protection. The fabric buildings can easily be extended after installation if needed.

MegaDome® buildings can be customized with various industrial options, like single or double roll-up openings, side garage doors and ventilation systems, which are very useful when storing bulk goods. With over 50 years of experience in the greenhouse industry with Harnois Greenhouses, Harnois has developed high-performance ventilation systems that are adapted to MegaDome® buildings. The in-house engineering team can design a building to meet precise ventilation needs, ensuring the products stay dry in all weather and conditions.

The structure is covered by a PowerShield® membrane that allows natural light to penetrate the building easily





all year long. It reduces the need for artificial light, which can add up to considerable energy savings. This durable waterproof and fire-resistant membrane is assembled at Harnois' factory to ensure its quality.

**ADAPTED FOR BIOMASS TRANSFORMATION  
— A CASE STUDY**

The Centre de Valorisation Mario Charrette is a wood shredding and storage

facility and one of MegaDome®'s clients. It was looking for a building that would allow it to transform its wood to biomass. The solution was a 125 x 600ft building from the 100 series.

The foundation was built above ground with added membrane to protect the ground from contamination. The client can now store materials in a dry, protected environment and can access them easily all year round.

Known in the industry for its innovation, dedicated team and the high quality of its service and products, Harnois' integrated offering ensures its clients always find the right solution for their unique needs. Looking to the future, Harnois will continue to push the boundaries of engineering to deliver solid, scalable, durable and cost-effective solutions that ensure the success of its clients.



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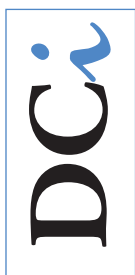
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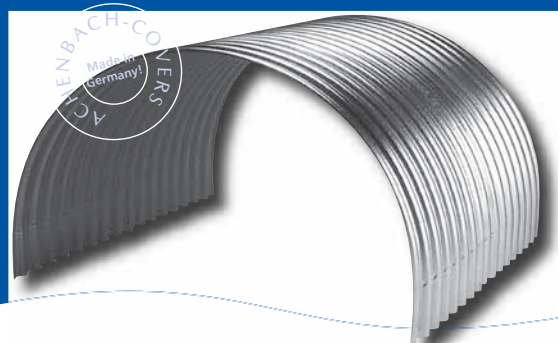
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*Manufacturer of grabs, grapples and clamshell buckets for cable, hydraulic and electro-hydraulic operation. Models for ships-gear, gantry, crawler cranes, and hydraulic equilibrium cranes. Brands include Pro-line, Hawco, Anvil, Owen, Yaun, Williams & Drott. New, used, rebuilds, repairs, parts and service since 1905.*

## APPLIED CONVEYOR TECHNOLOGY, INC. DBA THE ACT GROUP

14644 El Molino Street  
 Fontana CA 92335-6205  
 USA  
**Contact:** Mr Edward Sunseri  
**T:** +1 909 350 4703  
**F:** +1 909 350 4982  
**E:** esunseri@groupactinc.com  
**W:** www.groupact.com  
*Bulk material handling: includes supply and design of conveyor, hoppers, screens, crushers. Dust control includes dust collection and dust suppression utilizing air, water and chemicals. Engineering services and complete service and installation capabilities are also offered.*

## ARLONA ENGINEERING

PO Box 41125  
 Rossburgh  
 Durban KZN 4072  
 South Africa  
**Contact:** Mr Steve Christy  
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**T:** +27 31 205 95 90  
**F:** +27 31 205 98 35  
**E:** steve@arlona.co.za  
**W:** www.arlona.co.za  
*Established in 1975, Arlona Engineering is the largest manufacturer and supplier of stevedoring equipment in South Africa. Products are designed and manufactured to suit the*

arduous conditions experienced on the African continent.

## AS LNK INDUSTRIES

27 Skanstes Street  
 Riga LV-1013  
 Latvia  
**Contact:** Mr Kristis Leiskalns  
**Job Title:** Marketing & PR Spokesman  
**T:** +37 167 334 012  
**E:** office@lnk.lv  
**W:** www.lnk.lv

## ASGCO "COMPLETE CONVEYOR SOLUTIONS"

301 Gordon Street  
 Allentown  
 PA 18102  
 USA  
**Contact:** Mr Aaron Gibbs  
**Job Title:** President  
**T:** +1 610 821 0216  
**F:** +1 610 778 8991  
**E:** info@asgco.com  
**W:** http://www.asgco.com/  
*At ASGCO "Complete Conveyor Solutions" we use engineered products and services to provide our customers with the best solutions to their conveyor material handling applications. Combined with our global network of distributors, we are part of a coordinated team focused on insuring your success.*

## ASHTON BULK LTD

The Old Tannery  
 Kelston  
 Bath BA1 9AN  
 UK  
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**E:** admin@ashtonbulk.com  
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## ATLAS MANUFACTURING CO. INC

PO Box 1969  
 622 East McPherson Drive  
 Monticello  
 Mississippi MS 39654  
 USA  
**Contact:** Mr Ashley Watson  
**Job Title:** Sales Manager  
**T:** +1 601 587 4511  
**F:** +1 601 587 5393  
**E:** ashley@atlasmanufacturing.net  
**W:** www.atlasmanufacturing.net  
*Custom designed one, two, three, four rope and hydraulic Clamshells / Grapples and Continuous Unloader Buckets. Best seller Atlas 4-rope clamshell buckets for large stevedoring and mobile harbor cranes. These buckets are built to maximize production and equipment service life.*

## AUGUST PENKERT GMBH

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**F:** +49 2084 1969 22  
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**W:** www.penkert.com

## AUMUND FOERDERTECHNIK GMBH (AUMUND GROUP)



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 Rheingeb, D-47495  
 Germany  
**Contact:** Dr-Ing Pietro de Micheli  
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**T:** +49 2843 720  
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**E:** minerals@aumund.de/  
 power@aumund.de  
**W:** www.aumund.com  
*Engineering, manufacture and supply of bulk materials handling equipment such as Bucket Elevators, Pan and Chain Conveyors, Samsom® Feeders, silo discharge machines (Rotary Discharge Machine, Silo Discharge CENTREX®). Services also include PREMAS® field assembly, site supervision, commissioning, after sales service, refurbishment and upgrading of existing equipment.*

## AURECON

PT Aurecon Indonesia  
 Alamanda Towers 24th Floor, Unit C-D  
 Jl.T.B. Simatupang Kav. 23-24, Cilandak Barat  
 Jakarta 12430  
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**E:** Jeff.Turticci@arecongroup.com  
**W:** www.aurecongroup.com  
*Aurecon provides engineering, management and specialist technical services for support infrastructure solutions for international and local coal and mineral clients in full or partial 'Pit to Port' projects.*

## AURECON

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 55 Grenfell Street  
 Adelaide  
 South Australia 5000  
 Australia  
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**F:** +61 8 8237 9778  
**E:** SymonsS@ap.aurecongroup.com  
**W:** www.aurecongroup.com

## AUSENCO ENGINEERING CANADA INC.

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 British Columbia V6B 2W2  
 Canada  
**Contact:** Ms Kate Stephens  
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**E:** kate.stephens@ausenco.com  
**W:** www.ausenco.com  
*Leading engineering contractor operating worldwide in the mining, and bulk terminals industries, providing services in materials handling, transportation and export/import facilities. Services span all aspects of project development including planning studies, detailed design, EPCM and EPC (design/build) project execution. Other services: Heavy Haul Rail, Slurry Pipelines, Simulation, Marine Structures, Coastal Engineering, Asset Management, Optimisation, and Contract Operations.*

## B.V. BECO

Industrieterrein "De Biezen"  
 De Limiet 18  
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**W:** www.beco-vianen.com  
*One of the world's leading specialists in grabs for the bulk market. For more than 20 years BV Beco has been providing high-end, ready-to-run technological solutions. We have a big scale of products: Grabs - Wheelloaders, excavator and demolition equipment - Tipping Trailers - Hoooklift carriers - Harbour- and industrial trailers.*

## BABCOCK & WILCOX LOIBL GMBH

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**Job Title:** Managing Director  
**T:** +49 9421 92560  
**F:** +49 9421 925625  
**W:** www.babcock.com/loibl  
*Core business is the process engineering of bulk goods. With a highly specialized team, an environmentally conscious approach and reliability in our way of planning and managing, and through the application of state-of-the-art manufacturing engineering methods, we will live up to our reputation, meet the requirements of materials and technology, and guarantee the highest quality possible.*

## BAUER GEAR MOTOR

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 Esslingen  
 73734  
 Germany  
**Contact:** Mr Philip Crowe  
**T:** +49 711 3518276  
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## BEDESCHI MID-WEST CONVEYOR

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 66214  
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**Job Title:** Executive Vice President  
**T:** +1 913 261 2406  
**F:** +1 913 261 2472  
**E:** sudyv@mwcconveyor.com  
**W:** www.mwcconveyor.com  
*Products include motorized trippers, telescopic chutes, rotary plow feeders, barge loading and unloading systems, pipe conveyors, air supported conveyors, Silo storage and reclaiming systems. Materials handling systems are furnished for terminals, power plants, cement plants, fertilizer plants, steel mills and mines.*

## BEDESCHI SPA

  
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**E:** sales@bedeschi.com  
**W:** www.bedeschi.com  
*Founded in 1908 and since the early '70s has offered its experience to the cement, gypsum, mining, energy production (coal and petcoke) industries and pollution prevention, with a complete line of solutions for crushing (primary and secondary) and bulk material handling.*

## BEIJING HAOSHENG TRANSMISSION TECHNOLOGY CO., LTD.

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 Unit 2, Xingmao Center,  
 Greenland Central Plaza  
 Xinghua Street  
 Daxing District  
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## BEKAERT NV

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**F:** +32 9 3749 292  
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**W:** www.bekaert.com  
*Bekaert is a leader in manufacturing of wire and wire products for a wide range of industrial and household applications. Steel cord is the best way to reinforce a tire, a conveyor belt. Bekaert produces conveyor belt cords and woven steel cord fabrics for conveyor belt reinforcement.*

## BENDEZU PORT EQUIPMENT GMBH

C/ Camino Padre Cura, 15  
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**E:** info@bendezu.com  
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## BENETECH GMBH

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## BENETECH USA

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**T:** +1 630 844 1300 x214  
**F:** +1 630 844 0064  
**E:** blazeko@benetechusa.com  
**W:** www.benetechusa.com  
*Benetech provides engineering, equipment, installation, and field services for bulk material handling projects, dust control equipment, advanced transfer chutes, flue gas conditioning chemicals and systems, and slagging/fouling control products. Our Plant Professionals division provides operating and risk management consulting.*

## BEST SERVICE GROUP (B.S.G.) BVBA

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*Manufacturer of equilibrated cranes, selling to the international market.*

## BEUMER GROUP GMBH & CO KG



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**Contact:** Dr Andreas Echelmeyer  
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The BEUMER Group is an international leader in the manufacture of intralogistics systems for overland and pipe conveying and loading systems. With 4,200 employees worldwide, the BEUMER Group has annual sales of about EUR 770 million.

### BGS HOLLAND

Hoogeveeneweg 5  
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The Netherlands  
Contact: Ms Martina Hermans  
T: + 31 180 317838  
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E: info@bgsholland.nl  
W: www.bgsholland.nl  
Dust free loading chutes for shiploaders, truck and railcar loaders.

### BILFINGER TEBODIN BV

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Tebodin is an independent, multidisciplinary firm of consultants and engineers. We offer clients around the world the experience and expertise of more than 3,500 employees. Our extensive office network allows us to offer clients the best of both: integrated engineering and consultancy expertise combined with local knowledge. Clients include major international companies, governments and multilateral financing institutes.

### BINDER + Co AG

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### BLUE WATER MISTING

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South Australia  
5021  
Australia  
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### BLUG CREDEBLUG S.L.



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E: comercial@blug.es  
W: www.blug.es  
BLUG has over 40 years experience, more than 5,000 grabs delivered worldwide and offers a wide grab catalogue. BLUG solutions - from single-rope operated radio controlled and automatic grabs, to 4-rope and electro-hydraulic high volume grabs - to fit any crane, material and production requirements.

### BOGAERT TRANSMISSION (GEHA)

Industriepark  
Neringstraat 5  
Londerzeel B-1840  
Belgium  
Contact: Mr Luc Vliminckx  
T: + 32 52 75 0421  
F: + 32 52 30 01 98  
E: info@bogaert-transmission.com  
W: www.bogaert-transmission.com  
Specialists for over 30 years in supplying, engineering and manufacturing high quality chains and sprockets as well as for bucket-elevators en masse conveyors, apron conveyors etc and for cement, coal, fertilizer, steel, ore, minerals and other plants and factories.

### BOSCH REXROTH B.V.

Kruisbroeksestraat 1  
Boxtel  
Noord-Brabant  
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Contact: Mr Edwin Doedee  
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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.

### BOSCH REXROTH MELLANSEL AB

PRS-MLL  
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### BOSSTEK

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T: + 1 309 693 8600  
F: + 1 309 693 8605  
E: info@bosstek.com  
W: http://bosstek.com  
The DustBoss line of portable dust suppression equipment uses atomized mist technology, a more effective and less wasteful alternative to traditional methods such as hoses and sprinklers. BossTek also offers OdorBoss products for odour control.

### BOYNE AREA MANUFACTURING (BAM)

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W: www.boyernearea-mfg.com  
Boyerne Area Manufacturing designs and builds bulk material handling equipment for ship,

barge, railcar, & trailer loading & stockpiling. Over 40 years experience. We build loading spouts, positioners, gates and valves, diverters, air flow conveyors, wet or dry dust collectors, hopper feeders, and bag filters.

### BRELKO CONVEYOR PRODUCTS

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W: www.brelko.com  
BRELKO Design and manufacture a range of products for the bulk materials handling industry that is backed-up by a comprehensive installation and maintenance service. These products assist in the control of spillage, carryback and dust, as well as promoting trouble free flow of material at belt conveyor transfer and load points. Other equipment: Air Cannons, Belt tracking and alignment.

### BRIDGESTONE INDUSTRIAL LIMITED

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### BRIDON INTERNATIONAL LTD

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### BRUKS AB

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### BRUKS KLÖCKNER GMBH

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### BRUKS ROCKWOOD INCORPORATION

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Suite 109  
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Contact: Mr Ken Upchurch  
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T: + 1 770 849 0100 x109  
E: info@bruks.com  
W: www.bruks.com  
Machines and complete plants for processing, storing and handling bulk materials in Bulk



# SOME THINK LONG-DISTANCE TRANSPORT IS INFRASTRUCTURE-INTENSIVE. WE THINK DIFFERENT.

Transporting materials from remote locations has traditionally required significant infrastructure investments in road or rail links, vehicles, personnel and fuel. BEUMER offers an economical, efficient and environmental alternative – long-distance overland conveying. This gives you a dedicated, around-the-clock transport link at the fraction of the cost of infrastructure development. The reduced noise and air pollution minimises environmental impact and improves personnel safety. Add to that a high degree of design flexibility and customisation and you can see why overland conveying makes a big difference to operational efficiency and environmental protection.

For more information, visit [www.beumergroup.com](http://www.beumergroup.com)

MADE DIFFERENT

Terminals - including Tubulator conveyors, various storage solutions and ship loaders as core products. BRUKS supplies complete stockyard equipment and systems which range from the smallest semi-automated systems to the largest fully automated systems including open storage and closed or covered storage configurations.

### BUCKET MART INC.

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Illinois  
62959  
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**T:** + 1 813 390 8626  
**F:** + 1 813 908 9474  
**E:** salesbucketmart@aol.com  
**W:** www.bucketmart.net  
We have all sizes and types 1Yd.-32Yd. of new or used Clamshell/Grapple/Dragline/Rock Scoop/Misc. buckets for sale, rent or lease. Supplying Material Handling Service Companies Worldwide around the clock, 24/7!

### BULK CARGO HANDLING BVBA

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### BULK.ID

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BULK.ID is strong in turn-key solutions for the handling and recycling industries. We

collaborate with leading German manufacturers who deliver innovative products. A stable German partner and our own engineering, construction, assembly and service departments leads to an ideal collaboration for the customer. Other Equipment - Wind Sifters

### BUTTIMER ENGINEERING

Carrigean Industrial Estate  
Cahir  
Co. Tipperary  
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E21 CC60  
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**F:** + 353 52 744 1087  
**E:** info@buttimer.ie  
**W:** http://buttimer.com  
Buttimer Engineering are a diversified mechanical engineering company with 40 years' experience, specialising in bulk materials handling systems and high-quality steel fabrication. In 2014 Buttmer launched their DOCKSOLID brand, a range of market leading Standard and Environmental ship unloading hoppers.

### C SPENCER LTD

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### C. CHRISTOPHEL GMBH

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### CABLE ARM INC

3452 W Jefferson Avenue  
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**E:** info@cablearm.com  
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As well as offering environmental dredging expertise, Cable Arm manufactures a range of equipment for bulk handling. Its buckets incorporate special features for moving nearly any granular material. Utilizing a patented level-cut bite, its buckets are faster and more efficient in bulk handling, eliminating extra cleanup equipment.

### CACHAPUZ BILANCIAL GROUP

Parque Industrial de Sobreposta  
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Braga  
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### CALIM GRAB INDUSTRY

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Çinar San.  
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**W:** www.calimkepce.com  
Calim Grab Industry, established in 1970, specializes in manufacturing grabs for international seagoing cargo handling grabs. Over 2,300 grabs have been delivered worldwide to date. High-standard technology and reliable products are the result of our respect for the requirements of the market in combination with incremental improvement and implementation of experience gained throughout decades. CALIM GRABS will continue to be a reliable name in the machine industry.

### CAMBELT INTERNATIONAL CORP

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**T:** + 1 801 972 5511 ext 205  
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**E:** info@cambelt.com  
**W:** www.cambelt.com  
Cambelt International has been manufacturing dry bulk materials handling systems for the past fifty (50) years, specializing in steep-incline belt conveyors, utilizing its unique one-piece, fully-molded corrugated sidewall, cleated conveyor belting. Typical angles from 25° to 90° (vertical).

### CAPOTEX

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Madrid  
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### CARBONSER, S. A. DE C. V.

Guillermo Gonzalez Camarena  
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Carbonser is a company owned by Techint Group for the construction and operation of the 6 million tpa Petacalco Coal Terminal in the Pacific shore of Mexico. The installation includes two CSU manufactured by Techint Technology and is able to unload cape size vessels up to 150,000dwt.

### CARGOTEC SWEDEN AB, MARINE SELFUNLOADERS

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**E:** sales.enk@cargotec.com  
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Cargotec offers dry bulk handling systems for ship operators worldwide. Through the MacGregor brand, we provide complete self-unloading/loading systems for dry bulk carriers, integrated transloading solutions and bulk handling systems for offshore supply vessels - all designed to ensure efficient, flexible and environmentally-friendly operation. The systems are tailor-made for each customer's particular requirements. Virtually any dry bulk material can be handled.

### CARLSEN GROUP

Van Polanenweg 2  
Krimpen aan de IJssel  
2921 LT  
The Netherlands  
**Contact:** Mr Cor de Kwant  
**T:** + 31 180 440 720  
**E:** info@lionbulkhandling.com  
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### CATERPILLAR (UK) LTD.

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UK  
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### CATERPILLAR INC

100 NE Adams Street  
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IL  
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USA  
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**E:** Holling\_Sharon\_L@Cat.com  
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Offers five models of wheeled material handlers and six models of tracked material handlers. The diesel powered, hydraulic machines feature efficient Caterpillar engines, powerful hydraulics, fast cycle times and great mobility and versatility. Capacities range from a few tons to more than 20 tons.

### CATERPILLAR SARL

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Caterpillar builds and supports



A grab from CFS Handling, unloading coal at a port in Ukraine.



products that are ideally suited for dry bulk handling in port environments. CAT equipment can be used to load and unload ships, barges, transfer, load and store materials; build and manage stockpiles; clean and maintain ships and quays.

## CAVOTEC SA

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**Other Equipment:** Electrical Equipment.  
Cavotec is a leading engineering group that designs and manufactures automated connection and electrification systems for ports, airports and industrial applications worldwide. Our innovative technologies ensure safe, efficient and sustainable operations. To know more, visit: Cavotec.com

## CDM SYSTEMS, INC

19230 Evans Street NW  
Suite 202  
Elk River  
MN  
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USA  
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**E:** sales@cdmsys.com  
**W:** www.cdmsys.com  
Over 30 years experience offering a comprehensive range of bulk conveying systems, components and engineering/design services. Provide conveying and bulk handling solutions for materials from Ash through to Zinc, including marine applications as well as those in hostile, severe or high-temperature environments.

## CHANGSHA KAIYAN INSTRUMENTS CO. LTD

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## CHL EQUIPMENT LTD (INCORP. VERSTEGEN GRABS UK)

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## CICSA S.R.L.

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23883

Italy

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Since 1941 CICSA has been manufacturing high quality steel chains and components for bulk material handling applications. With a specific focus on bucket elevators and conveyors, CICSA produces a wide range of: round steel link chains, mechanical chains, forged link chains and lifting chains.

## CIMBRIA UNIGRAIN A/S



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**E:** cbe@cimbria.com  
**W:** www.cimbria.com  
Develops and markets a line of loading chutes and screw conveyors within dust-free bulk handling. Supplies solutions for all types of dry bulk materials and for all loading tasks - ship loading, warehousing, road and rail. Chutes are supplied with or without integrated filter and made of modularly-structured components, all kept in stock.

## CINTASA AMERICAS

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Leader in conveyor systems and material handling equipment designed and manufactured with in-house engineering and technology; adapted to client requirements. With over 45 years of specialization, Cintasa offers the best solution to our clients. Worldwide references in all industrial sectors.

## CINTASA S.A.

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## CITA LOGISTICS LLC

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**E:** cita-aust@citalogistics.com  
**W:** www.citalogistics.com  
CITA Logistics LLC provides a range of bulk materials services in USA and Australia: sourcing, logistics management including laytime calculations, Shipping Agency, sampling and analysis.

## CITA LOGISTICS LLC

3 Commercial Place Suite 150  
Norfolk  
Virginia  
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Coal operations at the Port of Yuzhny.

**Contact:** Mr Cedric Daenens  
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CITA offers under one umbrella: Bulk Logistics services management including cargo loading and vessel inspection, solid fuels sampling and analysis, Freight forwarding, full shipping agency in the USA (Hampton Roads, Baltimore and Mobile) as well as husbandry and protective agency services.

## CIVETTINI ITALO & C SAS (CFS HANDLING)



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BS  
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**W:** www.cfshandling.it  
Civettini Italo & c sas owner of the brand CFS Handling works in design and manufacturing of equipment for handling across a range of sectors including coal, cement, steel mills, demolition, ores, urban solid waste, paper etc. The company's product range includes mechanical, hydraulic and electro-hydraulic buckets as well as hydraulic and electro-hydraulic grabs to suit the customer's specific needs.

## CLAUDIUS PETERS PROJECTS GMBH

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**W:** www.claudiuspeters.com  
Product lines include grinding systems, storage and mixing silos, pneumatic conveying systems, ash removal systems, self-unloading vessels, packing and palletising systems, pulverised coal injection systems for blast furnaces.

## CLAUDIUS PETERS TECHNOLOGIES S.A.S

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**W:** www.claudiuspeters.com  
Claudius Peters Technologies SAS is a company of Langley Holdings. Specialised in Stockyards and Belt Conveying systems we develop all kind of projects with stackers, reclaimers, including side stackers, tripper, shuttle type stackers; bridge, portal or side reclaimers; linear or circular, open or covered.

## CLEVELAND CASCADES LTD



Unit 22 Dukeway  
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**W:** www.clevelandcascades.co.uk  
Designs and constructs the Cleveland Cascade bulk loading chute for shiploading, silo filling, truck and railcar loading and for conveyor transfer points. The chute minimises dust emissions and reduces product degradation and segregation.

## CLOUGH LIMITED

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A service provider of Project Management, Engineering and Construction Contracting services in the oil and gas (onshore and offshore), petrochemicals, mining and minerals processing industries, infrastructure (including power and harbour works) and manufacturing sectors.

## CNBM INTERNATIONAL ENGINEERING CO., LTD.

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## COAL & MINERAL TECHNOLOGIES (SABS)

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## COAL CONTROL

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## COBRA EUROPE SA

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**T:** +33 38 4938 930  
**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). Headquartered in France with the following sales subsidiaries: Russia and Central Asia (Kazakhstan, Ouzbekistan, Tajikistan): COBRA EURASIA Tel: 73 84 25 85 598, Email: cobraeurasia@bk.ru North and Central America: COBRA AMERICA Tel: 1423 968 9700, Email: bambi@cobraamerica.com Australia & New Zealand:

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## COECLERICI LOGISTICS S.P.A.

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**F:** +39 02 6246 9444  
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**W:** www.coeclerici.com  
Additional equipment: Offshore transloading operations. One of the best known and most reputed companies in the field of offshore transloading operations. This achievement is based on the dedication and commitment of the company towards its clients as well as being an integral part of the production chain with a view to long term relationships.

## COLES ASSOCIATES

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Specialising in acquisition, divestment and relocation and of pre-owned mining and infrastructure equipment worldwide.

## CONDUCTIX - WAMPFLER AUSTRALIA

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Conductix-Wampfler is a manufacturer and supplier of Power and Data Transfer equipment including conductor bar, festoon, cable and hose reels, Kabelschlepp cable chain and flexible cable, slip ring assemblies, radio controls, Kiepe conveyor belt monitoring equipment, UEE high voltage connectors and buffers.

# DUST FREE LOADING



**Leading the way with innovative dust free loading solutions for rail, ship, and barge loading of bulk materials at terminals and port facilities throughout the world.**



**DUST CONTROL AND LOADING SYSTEMS, INC.**

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## CONDUCTIX- WAMPLER



Rheinstrasse 27 + 33  
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79576  
Germany  
T: + 49 7621 662 0  
F: + 49 7621 662 144  
E: info.de@conductix.com  
W: www.conductix.com  
Conductix-Wampller'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- WAMPLER AMERICAS

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Leading global supplier of motorized cable reels, cable festoon systems, energy chains, conductor bar, and slip rings to the bulk materials handling and mining industries. We specialize in reliable, customized electrification systems for the most demanding applications. ISO9001:2008 certified.

## CONTINENTAL CONSTRUCTION (MEMPHIS)

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Continental Construction Company, Inc. is a general contractor specializing in slip form concrete construction, pile driving, structural steel erection, millwright work, marine construction, heavy concrete foundations, industrial buildings, and material handling systems.

## CONTINENTAL CONVEYOR & EQUIPMENT CO INC

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F: + 1 205 487 4233  
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W: www.continentalconveyor.com  
The company's High Angle Conveyor (HAC) system employs standard conveyor components and belts to utilise a simple but unique 'sandwich belt' approach to steep and even vertical conveyor elevations.

## CONTINENTAL MATADOR RUBBER, S.R.O.

Terezie Vansovej 1054  
Puchov  
020 01  
Slovakia  
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One of the biggest companies in the chemical and rubber industry in the Slovak Republic. Up to 85% of its production of tyres and conveyor belts is exported. Producer and supplier of textile and steel cord conveyor belts for the mining and construction industries worldwide.

## CONTITECH ANTRIEBSYSTEME GMBH

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## CONTITECH TRANSPORTBANDSYSTE ME GMBH

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conveyorbelts  
ContiTech Conveyor Belt Group is a leading development partner, manufacturer and system supplier of steel-cable and textile-ply conveyor belts, service materials and special products. In addition, Contitech provides a worldwide installation and maintenance service.

## CONTROL SYSTEMS TECHNOLOGY PTY LTD



47 Fitzpatrick Street  
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2212  
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W: www.controlsystems.com.au  
CST design and manufacturer high accuracy belt scale systems designed to provide the customers specified accuracy "in conveyor". CST say "Different Scales for Different Conveyors to achieve the Same Accuracy". Since 1984, CST has remained committed to high integrity, shunning short term commercial game for long term customer satisfaction.

## CONVEYOR DYNAMICS, INC.

3633 Alderwood Avenue  
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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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Santafe  
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## CPS PROJECTS (PTY) LTD

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T: + 27 31 466 4396  
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Port related services offered by CPS Projects as ff:  
-Maintenance Contracts (including labour supply) x000D  
-Electrical and automation services x000D  
-Structural repairs, equipment overhauls and upgrades x000D  
-Ad-hoc repairs (accident damage and component failure) x000D  
-Supply of Spare Parts x000D  
-Erection and Commissioning of new equipment

## CRANES MACHINERY CO., LTD (CMC)

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## CRS - CONTAINER ROTATION SYSTEMS PTY LTD

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## CST COVERS

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Founded in 1964 the company designs, manufactures and erects architectural and environmental enclosures. These are primarily clear-span domes and related space frames fabricated mostly from aluminium. Structures are used for covering tankage and bulk storage facilities of all types and shapes.

## CST STORAGE

903 E 104th Street, Suite 900  
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E: sales@cst-storage.com  
W: www.cstindustries.com  
Formerly Columbian TecTank, the world's largest manufacturer of factory-coated bolted and welded tanks for dry bulk storage. Flat-bottomed tanks and hopper bottom silos with capacities up to 13,200 cubic meters. ISO Certified.

## CWA ENGINEERS INC.

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CWA is a multidisciplinary EPCM firm that provides professional services including planning, engineering, procurement, construction management, and maintenance and operations support to industry-leading clients in the bulk materials handling, mining and mineral processing, and ports and marine terminals sectors.

## DALIAN HUARUI HEAVY INDUSTRY INTERNATIONAL CO. LTD

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## DCL, INCORPORATED



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T: + 1 231 547 5600 Ext 3124  
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E: sales@dclinc.com  
W: www.dclinc.com  
Provides full dust control loading systems and partial components to the bulk material handling industry and designs custom equipment. A complete Research/Development team is located on site. Single source manufacturing from ship loading systems to valves and dust collectors can be provided.

## DE REGT CONVEYOR SYSTEMS

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E: peter@deregt.com  
W: www.deregt.com  
De Regt is a company specialized in developing, building and installing conveyor systems and structures needed to achieve a partial or total project.

## DEMARCO INDUSTRIAL VACUUM CORPORATION

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Manufactures a complete line of heavy duty DEMARCO Industrial Vacuum Systems and for all flowable materials, wet or dry, etc. Units are available in portable, stationary, towable, central turnkey installed systems, canister vacuums, and custom engineered systems.

## DEMCOTECH ENGINEERING

Modderhouse  
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DemcoTECH, a multi disciplinary Engineering and Project management company specialising mainly in Bulk Materials handling, but also small process plants. Based in South Africa, work is performed internationally and varies from consulting type studies to the execution of Turnkey projects.

# RopeCon®

## Efficient Solutions for Bulk Material Handling

Wherever bulk material needs to go – across impassable terrain, rivers, highways and buildings – RopeCon® delivers without a hitch!

Long distances, capacities of up to 25,000 tonnes/hour, minimal environmental footprint, quiet operation plus low operating and maintenance costs: These are the features that convinced leading mining businesses.

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DUSTCRUSTING  
TECHNOLOGY B.V.  
(OBD GLOBAL B.V.)**



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*Den Bakker Dustcrusting technology b.v. (dbd global), is an expert in dust control and prevention with the Dustcruster® technology. Dustcruster is far better than continuously spraying and waste pure water. Dustcruster® creates a long-lasting and clearly visible white crust which will last for a long time. Even in tough atmospheric conditions.*

**DEUTSCHE  
GROBWÄZLAGER  
GMBH**

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Rostock  
MV18069  
Germany  
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**Job Title:** Head of Sales  
**T:** + 49 381 4407 10 31  
**F:** + 49 381 4407 10 931  
**E:** info@dgwl.de  
**W:** www.dgwl.de

**DMN-  
WESTINGHOUSE**

Gieterij 3  
Noordwijkerhout  
Zuid-Holland  
NL-2211 WC  
The Netherlands  
**Contact:** Mrs Tonneke Krempel  
**Job Title:** Manager Marketing Services and PR  
**T:** + 31 252 361 800  
**F:** + 31 252 375 934  
**E:** dmn@dmn-nwh.nl  
**W:** www.dmnwestinghouse.com  
*Other equipment: Rotary Valves, Diverter Valves. Designs and manufactures rotary valves, diverter valves and other components. Optionally pressure shock resistant to 10 bar, flame proof also suitable for handling St2 powders, ATEX compliant to Directive 2014/34/EU. Extensive sales and distribution network, ensures global service and support.*

**DOME CORP OF  
NORTH AMERICA**

5450 East Street  
Saginaw  
Michigan  
48601  
USA  
**Contact:** Mr Ross Lake  
**Job Title:** President  
**T:** + 1 989 777 2050  
**F:** + 1 517 777 3477  
**E:** sales@dome-corp-na.com  
**W:** www.dome-corp-na.com

**DOME TECHNOLOGY,  
LLC**

4946 North 29th East  
Idaho Falls  
ID  
83401  
USA  
**Contact:** Mr Jason Miller  
**Job Title:** Vice President of

Marketing  
**T:** + 1 208 529 0833  
**F:** + 1 208 529 0854  
**E:** jason.miller@dometechnology.com  
**W:** www.dometechnology.com  
*Other equipment: Serve the biomass, power, mining, cement, fertilizer, and grain markets. We provide geotechnical analysis, deep foundation solutions, engineered tunnels. Integrate material handling safety protocols with dome design. Concrete domes are designed to contain volatile products as well as cover products.*

**DOMTEC  
INTERNATIONAL LLC**

4355 N Haroldsen Drive  
Idaho Falls  
Idaho  
83401  
USA  
**Contact:** Mr Mike Hunter  
**Job Title:** General Manager  
**T:** + 1 208 522 5520  
**F:** + 1 208 522 5344  
**E:** domtec@domtec.com  
**W:** www.domtec.com  
*World class, high quality concrete dome builder for storage of a multitude of dry bulk materials, including coal. DOMTEC has broad experience with reclaim systems. Projects are delivered around the world on time and within budget.*

**DONALDSON EUROPE**

**B.V.B.A**  
Research Park Building No. 1303  
Interleuvenlaan 1  
Leuven  
B-3001  
Belgium  
**Contact:** Ms Elina Baltatz  
**Job Title:** Marketing & Communications Specialist  
**T:** + 32 16 39 03 77

**E:** Elina.Baltatz@Donaldson.com

**DONALDSON  
FILTRATION  
DEUTSCHLAND GMBH**

Industriestraße 11  
Dülmen  
48249  
Germany  
**T:** + 49 2594 781 0  
**F:** + 49 2594 781 21  
**E:** IAF-de@donaldson.com  
**W:** www.DonaldsonTonitDCE.com  
*Donaldson is a leading worldwide provider of filtration systems that improve people's lives, enhance our Customers' equipment performance, and protect our environment. We are committed to satisfying our Customers' needs for filtration solutions through innovative research and development, application expertise, and global presence.*

**DOPPELMAYR  
TRANSPORT  
TECHNOLOGY GMBH**



Konrad-Doppelmayr-Str. 1  
Wolfurt  
6922  
Austria  
**T:** + 43 5574 604 1800  
**E:** dtt@doppelmayr.com  
**W:** www.doppelmayr-mts.com  
*Doppelmayr Transport Technology solves all transport issues in the field of bulk materials and unit loads with a range of sophisticated material transport systems - from well-proven material ropeways to innovative long-distance conveyor systems for high capacities.*

**DOS SANTOS  
INTERNATIONAL, LLC**



531 Roseline Street  
Suite 810  
Marietta  
GA  
30060  
USA  
**Contact:** Mrs Amy D. Duncan  
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**T:** + 1 770 423 9895  
**F:** Text: + 1 916 US SNAKE  
**E:** info@dossantosintl.com  
**W:** www.dossantosintl.com  
*Other Equipment: DSI ExConTec - conveyor analysis software. Dos Santos International is the world's foremost authority on high-angle conveying technology. We offer the DSI Sandwiche belt high angle conveyor, the most reliable high-angle and vertical conveying means for your high tonnage, high lift requirements. DSI also offers engineering consulting and provides in house software for load analysis.*

**DOUBRAVA GES  
GMBH**

Industriestrasse 17-20  
Attnang-Puchheim A-4600  
Austria  
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**E:** office@doubrava.at  
**W:** www.doubrava.at

**DRY-BAG A/S**

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Aarhus C  
DK 8000

Denmark  
**Contact:** Mr Soren  
**Job Title:** Marketing  
**T:** + 45 86 19 0500  
**F:** + 45 86 19 0577  
**E:** production@dry-bag.dk  
**W:** www.desiccant.com

**DUNLOP CONVEYOR  
BELTING**

Oliemolenstraat 2  
PO Box 14  
Drachten 9200 AA  
The Netherlands  
**Contact:** Mr Andries Smilda  
**Job Title:** Sales & Marketing Director  
**T:** + 31 512 585 446  
**F:** + 31 512 585 433  
**E:** marketing.drachten@dunlopbc.com  
**W:** www.dunlopconveyorbelting.com  
*Manufactures a full range of textile, aramid and steelcord conveyor belting systems.*

**DURO FELGUERA,  
S.A.**

Parque Científico y Tecnológico de Gijón  
c/Ada Byron, 90  
Gijón, Asturias 33203  
Spain  
**Contact:** Mr Angel Pelegry  
**Job Title:** Sales Director - DF Mining and Handling  
**T:** + 34 985 199 201  
**F:** + 34 985 199 059  
**E:** dfmh@durofelguera.com  
**W:** www.dfdurofelguera.com  
*DF Mining & Handling is the DF division specialised in turnkey projects for Mineral Processing and Bulk Material Handling Facilities, mainly Concentration Plant and Loading and Unloading Terminals at Ports. The company assists customers and investors in all phases of a project: feasibility studies, design, detailed engineering, procurement,*

**DUST!**  
The headache of each terminal operator!

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den bakker dustcrusting technology b.v.  
Rijksstraatweg 167a  
3222 KD Hellevoetsluis  
The Netherlands  
**Phone:** +31 (0)181-399632  
**Fax:** +31 (0)181-399634  
**E-mail:** info@denbakker.nl  
**Contact:** J.A.A. den Bakker (CEO)  
**E-mail:** j.d.bakker@denbakker.nl  
**Mobile:** +316 51566863  
**Web:** www.dbdglobal.com

Partner:



Tunnellaan 117  
B-9060 Zelzate, Belgium  
**Phone:** +32 9 372 63 77  
**Fax:** +32 9 372 41 88  
**Contact:** Marc Verschaeve  
**E-mail:** marc@bpcinternational.be  
**Mobile:** +32 475 69 68 73  
**Web:** www.bpc-international.com



construction, commissioning and operation and maintenance of the facility and it's recognised on a global scale as a reputable EPC contractor.

## DUST SOLUTIONS INC

130 Bay Pines Road  
Beaufort  
South Carolina  
29906  
USA

**Contact:** Mr Richard Posner

**Job Title:** President  
T: + 1 843 846 3700  
F: + 1 843 846 3701

**E:** sales@nodust.com

**W:** www.nodust.com

Manufacturers Dry Fog Dust Suppression Systems for bulk material handling - 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 Windfence Systems for stockpiles.

## E-CRANE WORLD WIDE

Koekoeklaan 53  
Adegem  
B-9991  
Belgium

**Contact:** Mr Bas Tolhuizen

**Job Title:** International Sales Manager  
T: + 31 165 320100  
F: + 31 165 320759

**E:** bas.tolhuizen@e-crane.com

**W:** www.e-crane.com  
Main activity is the sale and support of the E-Crane, a multifunctional crane designed for bulk material handling, storage, process feeding at ports etc.

## E-CRANE WORLD WIDE / E-CRANE INTERNATIONAL USA

1332 Freese Works Place

Galion  
Ohio  
44833  
USA

**Contact:** Mr Mark W Osborne

**Job Title:** President  
T: + 1 419 468 0090  
F: + 1 419 468 0074

**E:** mark.osborne@e-crane.com

**W:** www.e-crane.com

E-Crane International USA offers the E-Crane (Equilibrium Crane) in capacities ranging from 5.5 to 39 (metric) tons and outreach ranging from 24.8 to 47.8 metres (82 to 157 feet) for efficient offloading of bulk commodities.

## EDGE INNOVATE. (NI) LTD

30 Farlough Road  
Newmills

Dungannon  
County Tyrone  
BT71 4DT

Northern Ireland

**Contact:** Mr Lee Williamson

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T: + 44 2887 740525  
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**E:** info@edgeinnovate.com

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

## EGIS PORTS

15 avenue du Centre  
CS 20538  
Guyancourt - Saint Quentin en Yvelines  
78286  
France

**Contact:** Mr Sylvain Bourgois

**Job Title:** Head of Port Development  
T: + 33 1 3941 4017  
**E:** sylvain.bourgois@egis.fr  
**W:** https://www.egis-group.com/  
Egis Ports' activity covers all stages of ports and dedicated terminals, inland waterways, logistic hubs and coastal development, from feasibility and conceptual studies to works supervision. Major capabilities in Port Operations: handling equipment's, information systems, safety/security and environment management.

## EIFFEL ETABLISSEMENT SOMDEL

80 bis rue Jean Jaurès  
Quievrechain  
F-59920  
France

**Contact:** Mr Gérard Pellez

**Job Title:** (see ed notes)  
T: + 33 32 714 1516  
F: + 33 32 714 1515

**E:** contact.somdel.eiffel@eiffage.com

**W:** www.eiffel.fr

Specialised in the provision of tailor made lifting and handling equipment. The range of products extends from EOT for steel plants, nuclear power plants and gantry cranes to ship loaders, ship unloaders, stackers and reclaimers, conveying systems and turnkey installations.

## ELECON ENGINEERING COMPANY LTD

Post Box # 6  
Anand Sojitra Road  
Vallabh Vidyanagar  
Gujarat  
388 120  
India

**Contact:** Mr Paresch Vyas

**Job Title:** Corporate

Communications  
T: +91-2692-237016 / 230166 (MHE)

**E:** info@gear@elecon.com

**W:** www.elecon.com

Elecon since established in 1951, apart from Power Transmission Products, provides engineered solutions, manufactures and supplies Bulk Material Handling Plants and Equipments for the core sector industries which includes power, steel, cement, fertilizer, port mechanisation and open cast mines in India and Abroad.

## ELECON SINGAPORE PTE LTD.

10, Anson Road  
#24-03

International Plaza

Singapore

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Singapore

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T: + 65 6227 4694  
F: + 65 6227 8942

**E:** vipul@singapore.elecon.com

**W:** www.elecon.com

## ELGIN ENGINEERING AND CONSTRUCTION

2001 Butterfield Road  
Downers Grove  
Chicago  
Illinois  
60515  
USA

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**Job Title:** Marketing Director  
T: + 1 630 434 7200  
F: + 1 630 434 7272

**E:** soros@elginindustries.com

**W:** www.elginindustries.com

An international consulting engineering firm specialising in conceptual development, planning, feasibility studies, design engineering, project management, construction supervision, rehabilitation and expansion of port facilities.

## EMS-TECH INC



699 Dundas Street West  
Belleville  
Ontario  
K8N 4Z2  
Canada

**Contact:** Mr Kyle Sorensen

**Job Title:** Assistant Manager,  
Global Sales & Market Research  
T: + 1 613 966 6611  
F: + 1 613 966 6710

**E:** sales@ems-tech.net

**W:** www.ems-tech.net

A multi-task, multi-discipline company specialising in design and supply of dry bulk material handling equipment, both mobile and stationary; including custom designed conveyors, belt elevators, receiving hoppers, storage/load-out systems, environmental controls, shiploaders, stackers and reclaimers, transhippers, self-unloading ships.

## EMTICI ENGINEERING CO LTD

68 Sarat Bose Road  
Calcutta  
West Bengal 700025  
India

**Contact:** Mr D Sen

T: + 91 33 24761861  
F: + 91 33 24761831

**E:** info@pc@elecon.com

**W:** www.elecon.com

## ENCO ENGINEERING INC

4410 13th Street  
Wyandotte  
MI 48192  
USA

**Contact:** Ms Bobbi Lang

T: + 1 734 407 2400 x 202  
F: + 1 734 676 3436

**E:** enco@encoeng.com

**W:** www.encoeng.com

Provides a broad spectrum of services ranging from conceptual studies through detailed engineering and supply of shiploaders/unloaders and related bulk materials handling equipment.

## ENGICON NV

Broelstraat 20  
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B-8530  
Belgium

**Contact:** Mr Pieter Van Acker

**Job Title:** Sales & Marketing

Director  
T: + 32 56 73 21 21  
F: + 32 56 73 40 40

**E:** sales@geldof.be

**W:** www.geldof.be

Offers complete solutions in bulk handling systems.

Product range includes silos with extraction systems, discharge hoppers, pressure vessels and storage tanks, conveyor belts, screw conveyors, chain conveyors, bucket elevators.

## EPN SOLUTIONS

Karl Grankvist 1C  
Piteå SE-941 52  
Sweden

**Contact:** Mr Mattias Öman

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**E:** mattias.oman@epnsolutions.se

**W:** http://epnsolutions.se/

## EQUIPO LLC

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Dubai  
64624  
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Aboobackar

**Job Title:** Operations & Sales

Manager  
T: + 971 4 268 2216  
F: + 971 426 822 17

**E:** sales@equipollc.com

**W:** http://www.equipollc.com/  
We are one of the suppliers of grabs in PG & Indian Subcontinent. All our grabs are

radio remote controlled varying from 5 to 12 cbm. Grabs can be supplied on short term and long term rentals.

## ERIEZ EUROPE

Bedwas House Industrial Estate  
Bedwas  
Caerphilly  
CF83 8YG  
UK

**Contact:** Ms Gareth Meese

**Job Title:** Marketing Executive  
T: + 44 29 20 868 501  
F: + 44 29 20 851 314

**E:** Gareth.Meese@eriezeurope.co.uk

**W:** www.eriez.com

Eriez, a world authority in separation technologies is a one-stop solution thanks to its range of magnetic separators, metal detectors, feeders, wet drums and other processing equipment, particularly suited to the mining, aggregate and coal processing sector.

## ESCH GROUP BV

Veerweg 14  
Hoorn  
5145 NS

The Netherlands

**Contact:** Mr Rob ver Doren

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T: + 31 229 282 940  
F: + 31 229 233 177

**E:** info@eschgroup.nl

**W:** http://www.eschgroup.nl/

nl/home

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

## ESI EUROSILLO BV

Newtonstraat 26-28  
Purmerend  
1446 VR  
The Netherlands

**Contact:** Mr Richard Spaargaren

**Job Title:** Commercial Director  
T: + 31 299 630 730  
F: + 31 299 630 737

**E:** esi@eurossilo.com

**W:** www.eurossilo.com

Other Equipment: Mammoth

silo systems.

Active in the field of design construction and/or turnkey delivery of large scale enclosed storage systems for coal, FGD-gypsum, limestone, minerals, basic chemicals and potato starch. Storage capacity of this flat bottom mammoth silo system (Eurosilo) can range from 1,000 up to 100,000 m3 per unit

## ESSAR INDUSTRIES

15/B, Manjushree, 1st Floor, 2nd Floor  
Sri MVC Hanumanthaiah Road  
Nrupathunga Extension  
R.T. Nagar  
Bengaluru  
Karnataka  
560032  
India

**Contact:** Mr A.M Sherif

**Job Title:** CEO  
T: + 91 844 7531774

**E:** essarind@gmail.com

**W:** www.essarmaterialhandling.com/

## EUROMEC SRL

Via Visano 78/80  
Isorella 25010  
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**Contact:** Mr Gervasio Alessandro

**Job Title:** Sales Manager  
T: + 39 030 9958 151  
F: + 39 030 9952 223

**E:** sales@euromecsr.info

**W:** www.euromecsr.com

Our deep knowledge and 60

years experience in the

process of handling all

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ports and plants all over the

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Euromec pays particular

attention to the simplicity of the

manufacturing processes so

that it can keep production

costs low, improve final quality

and reduce maintenance. As a

result, our electrohydraulic and

mechanical equipment are

economical, reliable, long-lasting and with very low maintenance costs.

Equipment is built with respect

to the most rigorous

certifications worldwide, both

NEMA, ATEX and NEC 500

regulations for dangerous

environments and GOST laws.

## EURO-TRAMCO BV

Spacelab 47 D  
Amersfoort  
3824MR  
The Netherlands

**Contact:** Mr Hans Plekkenpol

T: + 31 33 4567033  
F: + 31 33 4558149

**E:** hans@tramco-europe.com

**W:** www.tramcoinc.com

Manufactures chain, screw and

bucket conveyors and

'Aerobelt' air-supported belt

conveyor systems.

## F E SCHULTE STRATHAUS GMBH & Co KG

Runtestraße 42  
Werl  
D-59457  
Germany

**Contact:** Mr Andre Hanke

T: + 49 2922 9775 0  
F: + 49 2922 9775 75

**E:** ha@schulte-strathaus.de

**W:** www.schulte-strathaus.de

Accessories for Conveyors:

Starclean Conveyor Belt

Scrapers, Belt Trackers, Spillex

transfer point seals, Friflo

impact plates and bars.

## FAIRPORT ENGINEERING

Market Place  
Adlington  
Lancashire  
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UK

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FEL is the UK market leader in

the successful development

and delivery of major projects

for the coal, quarrying &

aggregate and building and

concrete product sectors is a

company and is continually

enhancing its position within

the power, alternative fuels and

recycling markets.

## FAM MAGDEBURGER FÖRDERANLAGEN UND BAUMASCHINEN Gmbh

Sudenburger Wuhne 47  
Magdeburg  
D-39112  
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Marketing  
T: + 49 391 6380 10 1 03  
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**E:** sales@fam.de

**W:** www.fam.de

FAM successfully plans,

designs, constructs and

manufactures turnkey

equipment for extracting,

producing, loading and storing

bulk materials. FAM combines

know-how of series and

customized production

processes and offers a

complete range of

manufacturing services

including after-sales services

along with engineering.

## FAMUR FAMAK S.A.

Machinery and Equipment  
Company  
5 Fabry

**Contact:** Mr Robert de Rijke  
**Job Title:** Commercial Director  
Kenz Fiege Group  
T: + 31 75 6810 410  
E: r.derijke@kenz-fiege.com  
W: www.kenz-fiege.com  
Merger of Kenz offshore cranes and Fiege harbour cranes. Founded in 1836, Fiege designs and manufactures a complete range of bulk handling cranes including the unique and well proven Lemniscate floating grab cranes with capacities from 16-50 tonnes, gantry grab unloaders, single- and double boom cranes, kangaroo cranes.

## FLEXCO

2525 Wisconsin Avenue  
Downers Grove  
IL  
60515-4200  
USA  
**Contact:** Mr Martin O'Neill  
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T: + 1 630 971 0150  
F: + 1 630 971 1180  
E: info@flexco.com  
W: www.flexco.com  
Flexco, a manufacturer of products that enhance belt conveyor productivity, serves customers across the globe with efficient and safe products, services, and solutions. Flexco is able to address almost any challenge – from slippage and spillage, to mistracking and wear and tear, to safety and environmental concerns.

## FLEXCO EUROPE GMBH

Leidinger Strasse 40-42  
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D-72348  
Germany  
**Contact:** Mr Joerg Schairer  
**Job Title:** Managing Director  
T: + 49 7428 94060  
F: + 49 7428 9406260  
E: europe@flexco.com  
W: www.flexco.com  
Mechanical conveyor belt fastening systems and accessories; belt cleaning systems; ceramic lagging; maintenance tools.

## FLEXICON CORPORATION

2400 Emrick Blvd  
Bethlehem  
PA  
18020-8006  
USA  
T: + 1 610 814 2400  
F: + 1 610 814 0600  
E: sales@flexicon.com  
W: http://www.flexicon.co.uk/

## FLEXOVEYOR CONVEYOR

3795 Paris St., Unit D  
Denver  
Colorado  
80239  
USA  
**Contact:** Mr Bill Priddy  
T: + 1 303 375 0200  
F: + 1 303 373 5149  
E: billpriddy@flexoveyor.com  
W: www.flexoveyor.com

## FLSMIDTH A/S

Vigerslev Alle 77  
Valby  
DK-2500  
Denmark  
**Contact:** Mrs Camilla Travis  
T: + 45 3618 1000  
F: + 45 3645 4427  
E: ctr@flsmidth.com  
W: www.flsmidth.com  
FLSmidth offers products and solutions to handle any type of bulk material: lumpy, powdery, sticky, wet or dry. We supply process design and equipment for all materials handling applications for the cement industry, pulp & paper, fertiliser and related industries.

## FLSMIDTH GmbH

Alfred Leiner Strasse 3  
Lanzendorf  
A-2326  
Austria  
**Contact:** Ms Susanne Stidl  
T: + 43 2235 4751011  
F: + 43 2235 47568  
E: susanne.stidl@flsmidth.com  
W: www.flsmidth.com

## FLSMIDTH MINERALS PVT. LTD

FLSmidth House  
34 Egatoor  
Kelambakkam  
Old Mahabalipuram Road  
Chennai  
Tamil Nadu  
603 103  
India  
**Contact:** Mr Sivalingam  
Santhakumar  
**Job Title:** Library  
T: + 91 44 47484795  
F: + 91 44 27470301  
E: indiainfo@flsmidth.com  
W: www.flsmidth.com

## FLSMIDTH WADGASSEN GMBH

Karl-Koch-Strasse 1  
Wadgassen  
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**Contact:** Ms Starla Jackson  
**Job Title:** Global Marketing  
T: + 49 6834 470 664  
F: + 49 6834 470 631  
E: starla.jackson@flsmidth.com  
W: www.flsmidth.com  
FLSmidth has developed a worldwide reputation for supplying innovative, fully-mobile material handling equipment solutions including mobile conveyors, stackers, loaders and unloaders, stockyard systems, and crushing and sizing equipment.

## FRANZ WÖLFER ELEKTROMASCHINENFABRIK OSNABRÜCK GmbH

Industriestraße 14  
Osnabrück  
49082  
Germany  
**Contact:** Dipl.-Wirt-Ing Kahlen  
Helge  
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T: + 49 541 9022 13  
F: + 49 541 990 220  
E: h.kahlen@woelfer-motoren.com  
W: www.woelfer-motoren.com

## FRIGATE TECHNOLOGIES PRIVATE LIMITED

Gr. Floor, No. 9,  
Block 5, Eros Garden  
Charmwood Village  
Surajkund Road  
Faridabad  
Haryana  
121 001  
India  
**Contact:** Mr Ajay Hooda  
**Job Title:** Director (Marketing)  
T: + 91 129 251 1662  
F: + 91 116 617 3981  
E: office@frigate.in  
W: www.frigate.in  
Other Equipment: Silo, Bucket Elevator, Deep Pan Conveyor, Marine Vessels

## GAMA ENDUSTRI TESISLERI IMALAT VE MONTAJ AS

Narcissus Street No: 9, 06 520  
Söğütözü  
Ankara  
06540  
Turkey  
**Contact:** Mr Mehmet Artun  
**Job Title:** General Manager  
T: + 90 312 248 42 00  
F: + 90 312 4094360  
E: industry@gama.com.tr

W: www.gama.com.tr  
Other Equipment: Apron feeders, Air slides, Scrapers. One of Turkey's most prestigious leading contracting companies, with experience in constructing industrial and power plants, dams, pipelines, infrastructures and similar. Established in 1959, with clients worldwide, has completed more than 200 significant sized projects internationally.

## GAMBAROTTA GSCHWENDT

Viale Verona 200  
Trento  
38123  
Italy  
**Contact:** Ms Maria Nano  
**Job Title:** Marketing Department  
T: + 39 0461 920 403  
F: + 39 0461 933 391  
E: marketing@gambarotta.it  
W: www.gambarotta.it  
Design and manufacturing of bucket elevators, pan conveyors, drag chain conveyors, extractors and feeders, palletized product loaders, gate valves, cell feeders, flap valves and screw conveyors used in petrochemical, cement, coal, waste to energy plants and for power generation, steel and heavy industry applications.

## GANZ DANUBIUS TRADING CO LTD

Váci út 184  
Budapest  
H1138  
Hungary  
**Contact:** Mr Karoly Bajusz  
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F: + 36 1 329 8041  
E: gdtko@hu.inter.net  
W: www.ganztrading.hu  
Suppliers of level luffing harbour grab cranes, floating grab cranes and other bulk handling equipment.

## GENERAL KINEMATICS CORP.

5050 Rickert Rd.  
Crystal Lake  
IL  
60014  
USA  
**Contact:** Mr Gordon Frank  
**Job Title:** VP Sales & Marketing  
T: + 1 815 455 3222  
F: + 1 815 455 2285  
E: info@generalkinematics.com  
W: www.generalkinematics.com  
General Kinematics specializes in vibrating and rotary equipment and solutions for bulk processing of material in the foundry, recycling, scrap, mining, minerals, food, chemical, and wood industries. Each piece of GK equipment is custom engineered to your specifications to meet your process objectives.

## Geo - CHEM LABORATORIES PVT. LTD

Geo - Chem House  
294 Shahid Bhagat Singh Road,  
Fort  
Mumbai  
400 001  
India  
**Contact:** Mr Subhashis Chakraborty  
**Job Title:** Head of Marketing  
T: + 91 22 663 83838  
F: + 91 22 663 83800  
E: s.chakraborty@mumbai@geochem.net.in  
W: www.geochem.net.in

## GEOMETRICA INC

12300 Dundee Court  
Suite 200  
Cypress  
Texas  
77429  
USA  
**Contact:** Mr Cecilio Zalba  
**Job Title:** Sales Manager  
T: + 1 832 220 1200  
F: + 1 832 220 1201  
E: sales@geometrica.com  
W: www.geometrica.com  
Specialists in the design, fabrication and installation of bulk storage domed structures requiring large, column-free interiors, utilizing low maintenance galvanized steel or aluminum. Structures can cover any shaped area, can span over 300m, and can be erected even over operating stockpiles.

## GERTECH HANDLING SYSTEMS CC

PO Box 4014  
Durbanville  
Cape Town  
Western Cape  
7551  
South Africa  
**Contact:** Mr Gerrit De Hoog  
T: + 27 83 458 2415  
E: gerrit@gertech.co.za  
W: www.gertech.co.za

## GF MHS SRL

Via Serrati 7  
Paderno Dugnano (MI)  
Milan  
20037  
Italy  
**Contact:** Mr Francesco Tummillo  
**Job Title:** Managing Director  
T: + 39 0 2 91 08 20 02  
F: + 39 0 2 91 84 31 47  
E: info@gfms.it  
W: www.gfms.it  
Other Equipment: Pipe Conveyors. Please contact us with any Handling System problems, such as lay-out or pollution of your handled product.

## GOLDEN WEST INDUSTRIES

332 West Railroad Ave  
Price  
UT  
84501  
USA  
**Contact:** Mr Ellis Pierce  
**Job Title:** Advertising  
T: + 1 435 637 3211  
F: + 1 435 637 6628  
W: www.goldenwest-industries.com  
17 years experience providing dust control and anti-freeze solutions to the mining and material handling industries.

## GUTTRIDGE LIMITED

Wardentree Park  
Pinchbeck  
Spalding  
Lincolnshire  
PE11 3UU  
UK  
**Contact:** Mr Doug Anderson  
**Job Title:** Sales and Marketing Manager  
T: + 44 1775 765300  
F: + 44 1775 765304  
E: sales@guttridge.co.uk  
W: www.guttridge.co.uk  
Guttridge offers a wide range of bulk handling machinery, ideal for moving ores, granules, powders, sand, cement, salt and fertilizers around process plants. All our machines are manufactured to suit customers' individual requirements.

## GUVEN GRAB AND MACHINE LTD. Co

Nazim Hikmet Cad 536. sk. No: 9  
Aske Köyü  
Cayirova  
Kocaeli  
41420

Turkey  
**Contact:** Mr Engin Demir  
**Job Title:** Sales & Export Manager  
T: + 90 262 743 8858  
F: + 90 262 743 1141  
E: info@guvengrab.com  
W: www.guvengrab.com  
Established in 1984, with it's own manufacturing facilities, Guven Grab and Machine supplies it's range of grabs all over the world. These include radio remote control grabs, electro hydraulic clamshell/orange peel grabs, mechanical double wired grabs and mechanical clamshell/orange peel touch down grabs.

## HANGZHOU HUAXIN MECHANICAL & ELECTRICAL ENGINEERING Co., LTD.

No. 2 Xiyuan Road  
Xihu Science and Technology Economic Garden  
Sandun  
Hangzhou  
310030  
China  
**Contact:** Ms Sandy  
T: + 86 571 8131 5353  
F: + 86 571 8542 5353  
E: huaxin@huaxinhz.com  
W: www.huaxinhz.com/?p=759

## HANSEN INDUSTRIAL TRANSMISSIONS (HIT) LTD

Nile Street  
Huddersfield  
West Yorkshire  
HD1 3LW  
UK  
**Contact:** Mr Terry Drayton  
T: + 44 1484 431414  
F: + 44 1484 431426  
E: info.uk@hansenindustrialgearboxes.com  
W: www.hansenindustrialgearboxes.com  
Hansen Transmissions design, manufacture, install and service industrial gearing. Our range spans from 80 Nm to 800 KNm (0.12 KW to 12MW) and is available in many configurations and drive packages.

## HANSEN INDUSTRIAL TRANSMISSIONS (HIT) NV

Leonardo da Vincilaan 1  
Edegem  
Antwerp  
2650  
Belgium  
**Contact:** Ms Lena De Wachter  
**Job Title:** Marketing  
**Job Title:** Marketing Communications Manager  
T: + 32 345 01200 / + 32 345 01306  
F: + 32 345 01220  
E: info@hansenindustrialgearboxes.com  
W: www.hansenindustrialgearboxes.com

Hansen Industrial Transmissions is at the pinnacle in innovation and durable drives for a wide range of industrial applications throughout the world, especially in sectors where low noise levels, minimum weight and high reliability are essential (including cooling towers, material handling, water treatment, etc.)

## HAPMAN

5944 East N Avenue  
Kalamazoo  
MI  
49048  
USA  
**Contact:** Mr Greg Patterson  
**Job Title:** Vice President  
T: + 1 269 343 1675  
F: + 1 269 349 2477

W: www.hapman.com  
You can trust our experience and quality to deliver equipment and systems for the effective movement of all types of coal.

## HASEL MACHINERY INC

Cumhuriyet Mh. Nr 15 E5  
Karayolu Uzeri  
Yakacak Kartal  
Istanbul  
31100  
Turkey  
**Contact:** Mr Osman Nuri Mete  
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T: + 90 216 452 9787  
F: + 90 216 452 9790  
E: osman.mete@hasel.com  
W: www.hasel.com

## HASKONING INDIA PVT LTD

13th Floor, Maithili's Signet  
Plot - 39/4, Sector 30A  
Vashi  
Navi Mumbai  
400 705  
India  
**Contact:** Mr Harel van den Brink  
**Job Title:** Director of Business - India  
T: + 91 22 4161 5004  
E: harel.van.den.brink@rdvhv.com  
W: www.royalhaskoningdhv.com

## HASLER GROUP SAS

Z.I. De l'Abbaye  
496 rue Louis Bréguet  
Pont-Evêque  
38780  
France  
**Contact:** Mr Michel Jamey  
**Job Title:** CAO  
T: + 33 474 161151  
F: + 33 474 161155  
E: sales.fr@hasler-gp.com  
W: www.hasler-gp.com  
Technological innovation is imprinted in the DNA of the HASLER Group, and has been our driving force for over a century. Dosing, mixing, filtration, processing - our diverse activities are empowered by the development of our expertise.

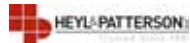
## HAUGEN SYSTEM AB

Fersens väg 12  
Malmö  
211 42  
Sweden  
**Contact:** Mr Malik Minhaj  
**Job Title:** Marketing Manager  
T: +46 40 30 64 00  
F: +46 40 30 63 30  
E: malik.minhaj@haugensystem.com  
W: www.haugensystem.com  
HAUGEN System AB is responsible for the marketing of mobile and stationary vacuum systems manufactured by DISAB Group in the MENA region. We also offer ATEX compliant systems, which can be used for handling combustible materials like coal and petcoke in the safest possible way.

## HAUK & SASKO INGENIEURGESELLSCHAFT MBH

Zeittaching 2  
Stuttgart  
70567  
Germany  
**Contact:** Mr David Sasko  
T: + 49 711 725 89-0  
F: + 49 711 725 89-50  
E: post@hauk-sasko.de

## HEYL & PATTERSON EQUIPMENT DIVISION OF THE HALL GROUP



701 Technology Drive  
Suite 100  
Canonsburg  
PA  
15317  
USA  
**Contact:** Mr Len Walnoha  
**Job Title:** Vice President  
**T:** + 1 412 481 1100  
**F:** + 1 724 758 1558  
**E:** heylpatterson@hallindustries.com  
**W:** www.heypatterson.com/  
railcar\_unloaders.aspx  
*Heyl & Patterson Equipment designs and constructs custom coal handling equipment, including railcar dumpers, railcar & barge movers, stackers, reclaimers and barge unloaders. Heyl & Patterson supports all equipment with field service, replacement parts, upgrades, retrofits and life extensions.*

## HITACHI CONSTRUCTION MACHINERY (EUROPE) NV

Sticliëweg 5  
Amsterdam  
1045 AT  
The Netherlands  
**Contact:** Ms Ghislaine Jonker  
**Job Title:** Manager Marketing  
**T:** + 31 20 44 76 700  
**F:** + 31 20 33 44 045  
**E:** info@hitachim.eu  
**W:** www.hitachim.eu  
*Hitachi Construction Machinery (Europe) NV's (HCME) main products are hydraulic crawler and wheeled excavators, wheel loaders, rigid dump trucks and special application machinery. HCME provides a broad product line-up that has earned an excellent reputation for performance, reliability and safety.*

## HKD BLUE

15 Mercer Road  
Natick  
MA  
1760  
USA  
**Contact:** Mr Gordon Santry  
**Job Title:** Business Development Manager  
**T:** + 1 617 913 7679  
**E:** gsantry@hkdblue.com  
**W:** www.hkdblue.com/  
*HKD Blue designs, manufactures, and sells water-atomizing dust control water cannons, spray bars, and pump-and-nozzle assemblies for dry bulk handling and loading facilities.*

## HORIZON CONVEYOR EQUIPMENT

Unit 1, Haysech Road  
Halesowen  
West Midlands  
B63 3PD  
UK  
**Contact:** Mr Alan Bowler  
**Job Title:** Managing Director  
**T:** + 44 121 550 2218  
**F:** + 44 121 550 2243  
**E:** info@horizonconveyors.co.uk  
**W:** www.horizonconveyors.co.uk  
*Manufacturers of Steel, Plastic & Aluminium Idler rollers, Conveyor Belt Scrapers and Conveyor Components & Equipment.*

## HOSCH- FÖRDERTECHNIK RECKLINGHAUSEN GMBH

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Recklinghausen  
D-45659  
Germany  
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Leombruno  
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**T:** + 49 2361 5898 0  
**F:** + 49 2361 5898 40  
**E:** mail@hosch.de  
**W:** www.hosch.de  
*HOSCH has been manufacturing and distributing Sprung Blade Scrapers and accessories for high precision belt cleaning for more than 30 years. The innovative design principle of its C-series, which is patented world-wide, utilises modular components and guarantees total belt cleaning efficiency for all types of installations.*

## 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  
*With the engineering system design and EPC as the principal business and the R&D and manufacturing of core products and relevant high-end products and investment operations as the support, HHI is committed to providing the clients with integrated solutions in terms of material handling engineering, thermal power engineering, industrial noise treatment engineering, clean & effective coal utilization engineering and offshore wind power engineering etc.*

## HYCONTROL LIMITED

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Orchard Street  
Redditch  
B98 7DP  
UK  
**Contact:** Mr Mark Stevenson  
**Job Title:** Marketing  
Administrator  
**T:** + 44 1527 406800  
**F:** + 44 1527 406810  
**E:** sales@hycontrol.com  
**W:** www.hycontrol.com  
*Hycontrol is at the forefront of level control, providing precision solutions across a wide range of industries. Hycontrol is the UK's leading silo protection expert with systems that exceed MPA guidance, utilising ground level testing for a safer working environment. Other equipment includes: level measurement, silo protection.*

## HYUNDAI HEAVY INDUSTRIES CO

1000 Bangeojinsunhwan-doro  
Dong-Gu  
Ulsan  
682-792  
South Korea  
**Contact:** Mr K H Lee  
**Job Title:** Public Relations  
Manager  
**T:** + 82 52 202 2114  
**F:** + 82 52 202 3470  
**E:** sbeurope@hhi.co.kr  
**W:** www.hhi.co.kr/

## IBAU HAMBURG

Roedingsmarkt 35  
Hamburg  
20459  
Germany  
**Contact:** Mr Mario Rämmele

**Job Title:** Sales Director  
**T:** + 49 40 361 309 24  
**F:** + 49 40 369 019 62  
**E:** mraemmele@ibauhamburg.de  
**W:** www.ibauhamburg.de  
*IBAU HAMBURG supplies installations and components for the transfer, storage and conveying of dry products, including among others fly ash and coal. Our scope includes the engineering and supply of plant components such as ship loaders and unloaders, as well as storage silos.*

## IGUS GMBH

Postfach 90 61 23  
Köln  
D-51127  
Germany  
**Contact:** Mr Theo Diehl  
**Job Title:** Head of Intl. Cranes &  
Materialhandling  
**T:** + 49 2203 9649 0  
**F:** + 49 2203 9649 222  
**E:** cranes@igus.de  
**W:** www.igus-cranes.com  
*Products include E-ChainSystems - in operation on Ship to Shore Cranes, RTGs, RMGs, Goliath Cranes, Spreaders, Reach Stacker etc. More than 3,000 port equipment applications are running world-wide with igus® E-ChainSystems.*

## IHI TRANSPORT MACHINERY COVAN., LTD. (IUK)

8-1 Seiroka Tower  
Akashi Cho  
Chuo-Ku  
Tokyo  
104-0044 MZ  
Japan  
**Contact:** Mr Tadashi Ito  
**Job Title:** Overseas Sales Dept  
**T:** + 81 3 5550 5375  
**F:** + 81 3 5550 5366  
**E:** Tadashi.Ito@iuk.co.jp  
**W:** www.iuk.co.jp  
*In addition: Multi-purpose gantry cranes IUK has supplied a lot of coal handling equipment and systems with cutting edge technology for world-wide customers and has had a world leading delivery record of the continuous ship unloaders.*

## 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@imgsga.com  
**W:** www.imgsga.com

## IMO GERMANY

Imostr. 1  
Gremsdorf  
Bavaria  
91350  
Germany  
**Contact:** Mrs Christina  
Straubmeier  
**Job Title:** Executive Assistant  
Sales  
**T:** + 49 9193 6395 1481  
**F:** + 49 9193 6395 3456  
**E:** christina.straubmeier@imo.de  
**W:** http://www.goimo.eu/

## IMPERIAL TECHNOLOGIES, INC.

4155 Martindale Rd., NE  
Canton  
OH  
44705

USA  
**Contact:** Mr Ron Tschantz  
**Job Title:** VP Gen Sales &  
Marketing  
**T:** + 1 330 491 3200  
**F:** + 1 330 491 3204  
**E:** rontschantz@imperial-  
technologies.com  
**W:** www.imperial-  
technologies.com  
*Imperial Technologies designs and supplies bulk material equipment including our enclosed "environmentally friendly" conveyors under Multi-Fold and Flexi-Cleat belt designs. We also provide conventional trough conveyors, fixed and radial stackers, sidewall conveyors, tripper conveyors, reversing shuttle conveyors, drag conveyors, related bulk materials handling equipment and our coal "variable speed vertical impact breaker" for dry coal processing called the Accelerator to improve raw coal from the mine.*

## INCOLAB SERVICES BV

PO Box 1561  
Oud-Beijerland  
BB  
3260  
The Netherlands  
**Contact:** Mr Leo Van Tour  
**Job Title:** Managing Director  
**T:** + 31 1866 10355  
**F:** + 31 1866 10552  
**E:** leo@incolab.com  
**W:** www.incolab.com  
*Incolab Services main target is to serve the solid fuel industry with own office and laboratories. Most of our laboratories are 17025 accredited. Present in Europe, former USSR, North and South America and North and South Africa.*

## INSPECTORATE INTERNATIONAL LTD

2 Perry Road  
Witham  
Essex  
CM8 3TU  
UK  
**Contact:** Mr John Soepnel  
**Job Title:** Business Development  
Manager Metals & Minerals Eur  
**T:** + 31 10 593 7234  
**F:** + 44 13 765 20819  
**E:**  
john.soepnel@inspectorate.com  
**W:** www.inspectorate.com  
*Inspectorate offers a full range of inspection, analytical and specialist testing services to the solid fuels and biomass industries and has coal-handling coordination offices and ISO 17025 accredited laboratories in all the major coal producing/consuming countries worldwide.*

## INSTRAL B.V.

Platinastraat 33  
Lelystad  
Flevoland  
8211AR  
The Netherlands  
**Contact:** Mr Nils Janbroers  
**Job Title:** General Manager  
**T:** + 31 3 2041 5591  
**E:** contact@instral.com  
**W:** http://www.instral.com/  
*Instral BV is a specialized and leading company in the world of dust protection and dust control. We offer dosing and spraying equipment/systems for dust control treatment (conveyor belts, stockpiles, yards, roads etc) Our C-Force® control additives are applicable for bulk storage and transhipment (coal, sand, iron ore pellets etc.) and at mining sites.*

## INTERMODAL SOLUTIONS PTY LTD

The Zhen Building  
210/33 Lexington Drive  
Bella Vista  
NSW  
2153  
Australia

**Contact:** Mr Garry Pinder  
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**T:** + 61 400 035 548  
**F:** + 61 288 835 195  
**E:** gpinder@isgpts.com  
**W:** www.pittoship.com/

## INTERNATIONAL BULK HANDLING TECHNOLOGY BV

PO Box 47  
Mierlo  
5730 AA  
The Netherlands  
**Contact:** Mr Johan M.A.M.  
Brands  
**Job Title:** Technical Manager  
**T:** + 31 492 664 885  
**F:** + 31 492 664 695  
**E:** info@ibtbulk.nl  
**W:** www.ibtbulk.nl  
*IBT offers over 40 years of expertise in the field of complex bulk handling systems. Capacity up to 6,000tph. Systems include high capacity steep incline conveyors, pipe conveyors, semi mobile large overland conveyors etc.*

## INTERSYSTEMS

9575 N 109th Ave  
Omaha  
NE  
68142  
USA  
**Contact:** Mr Hugo Wenshou  
**Job Title:** VP Sales, Industrial  
Sampling  
**T:** + 1 214 495 9713  
**F:** + 1 214 495 9741  
**E:** sampling@intersystems.net  
**W:** www.intersystems.net  
*Intersystems reaches a worldwide market and numerous industries with expertise in the engineer and manufacture of bulk material handling and industrial sampling systems.*

## ISAM AG GESELLSCHAFT FUER ANGEWANDTE KYBERNETIK

Alexanderstrasse 46  
Mülheim an der Ruhr  
45472  
Germany  
**Contact:** Dr Juergen Hellmich  
**Job Title:** Chief Executive Officer  
**T:** + 49 208 49 585 61  
**F:** + 49 208 49 585 62  
**E:** info@isam-ag.de  
**W:** www.isam-ag.de  
*ISAM delivers the full range of products and services for advanced automation of bulk material handling and port operations. We handle turn-key solutions for new automation projects as well as the upgrading of existing equipment including project management, electrical engineering and commissioning.*

## ISOMONTE SA

Rua Cristiano Franca Teixeira  
Guimaraes, 265  
Bairro Cinco  
Contagem  
Minas Gerais  
CEP 32010-130  
Brazil  
**Contact:** Mr Jose Rubem  
Almeida  
**T:** + 55 31 2128 2600 / 2641  
**F:** + 55 31 2128 2690  
**E:** info@isomonte.com  
**W:** www.isomonte.com.br  
*Specialises in the design and construction of turkey systems for materials handling, including shiploaders/unloaders, grabs, stacker/reclaimers and conveyor systems.*

## ITALGRU S.R.L.

4 Via Briantea  
Ambivere  
215500  
(BG)  
24030  
China  
Italy  
**Contact:** Mr Fabrizio Bonfanti  
**Job Title:** C.E.O.

**T:** + 39 0 35 49 32 411  
**F:** + 39 35 49 32 409  
**E:** fabrizio.bonfanti@italgru.it  
**W:** www.italgru.com

## J & B GRABS B.V.

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

## JAMES A. REDDING COMPANY

733 S. Center Avenue  
Somerset  
PA  
15501  
USA  
**Contact:** Mr Brian Putman  
**T:** + 1 814 444 7200  
**F:** + 1 814 445 1320  
**E:** salesinfo@jamesaredding.com  
**W:** http://www.jamesaredding.com/

## 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

## JENIKE & JOHANSON INC.

400 Business Park Drive  
Tynngsboro  
MA  
01879  
USA  
**Contact:** Mr Brian Pittenger  
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Development  
**T:** + 1 978 649 3300  
**F:** + 1 978 649 3399  
**E:** bhittenger@jenike.com  
**W:** www.jenike.com  
*Jenike & Johanson is the world's leading company in powder and bulk solids handling, processing, and storage technology. Over the past 55 years, we've tested over 10,000 unique powders and bulk solids and worked on more than 7,500 projects, giving our team the broadest real-world and in-depth experience in the industry to address a wide variety of bulk material handling and engineering needs.*

## JFE ENGINEERING CORPORATION

Marunouchi Trust Tower North  
1-8-1 Marunouchi  
Chiyoda-ku  
Tokyo  
100-0005  
Japan  
**Contact:** Mr Takashi Ishii  
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**F:** + 81 3 6216 0802  
**E:** ishii-takashi@jfe-eng.co.jp  
**W:** www.jfe-eng.co.jp/en/

## JIANGSU ZHENDONG PORT MACHINERY MANUFACTURING CO., LTD.

Changshu City  
Jiangsu Province  
215500  
(BG)  
24030  
China  
**Contact:** Ms Doris Chen  
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**T:** + 86 0512 529 36333  
**F:** 86-512-52936333



F: + 86 1512 529 35033  
E: jszgdj@163.com  
W: www.cnzdgj.net/

## JIM WAY ENTERPRISE Co., Ltd

No.17 Chang Tai Street  
Hsiao Kang Dist.  
Kaohsiung  
81266  
Taiwan  
**Contact:** Mr Guillermo Su  
**Job Title:** Assistant Manager Int'l Sales & Marketing  
T: + 886 7 8718126  
F: + 886 7 8718128  
E: jw@roller.com.tw  
W: www.roller.com.tw  
More than 35 years of experience in bulk material handling. Jim Way is an expert belt conveyor accessories manufacturer and meets the ISO 9001 quality standard. We deal with several issues caused by belt mistracking and improve productivity goals.

## JOHANNES HÜBNER FABRIK ELEKTRISCHER MASCHINEN GMBH

Siemensstrasse 7  
Giessen  
D-35394  
Germany  
**Contact:** Mr Thomas Brandenburger  
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T: + 49 641 79 69 0  
E: thomas.brandenburger@huebner-giessen.com  
W: www.huebner-giessen.com  
Hübner Giessen is considered a market leader in encoder and drive technology with activities in the following industrial sectors: Steelworks and rolling mills, mining, cranes, railways, marine, oil and gas, traction technology, hydroelectric power plants and energy systems.

## JOY GLOBAL INC

100 East Wisconsin Avenue  
Milwaukee  
WI  
53202  
USA  
**Contact:** Mr Edward L Doheny  
**Job Title:** CEO  
T: + 1 414 319 8500  
E: info@joyglobal.com  
W: www.joyglobal.com/

## JSC RIKON

Tvaika Street 68b  
Riga  
LV-1034  
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T: + 371 67393156 / + 371 29103410  
F: + 371 67393828  
E: rikon@rikon.lv or sales@rikon.lv  
W: www.rikon.lv  
AS RIKON is one of the leading manufacturers of port handling equipment with more than 60 years experience. The company manufactures high quality portal and mobile harbour cranes and grabs for multiple purposes, loads and material types.

## JSC TEHNOROS

Gzhatskaya st, 21, 1ter A  
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195220  
Russia  
**Contact:** Mr Oleg Kasinov  
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T: + 7 812 718 82 82 (232)  
E: Kasinov@tehnoros.ru  
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## KALENBORN KALPROTECT GMBH & Co. KG

Asbacher Str 50  
Vetterschoss  
D-53560  
Germany

**Contact:** Mr Thomas Serr  
**Job Title:** Head of Corporate Communication and Marketing  
T: + 49 26 45 18 201  
F: + 49 26 45 18 180  
E: thomas.serr@kalenborn.com  
W: www.kalenborn.com  
Wear-protection materials and services. Engineering, production, and worldwide installation of highly wear-resistant linings and components made of ceramic, metallic and plastic materials for protecting all kinds of bulk handling equipment.

## KCT GRAB INDUSTRY

Agva cad. yeni sanayi sitesi  
No:3-5  
Sile  
Istanbul  
34980  
Turkey  
**Contact:** Eng Gozde Kocatas  
**Job Title:** Sales  
T: + 90 216 739 59 68  
F: + 90 216 449 90 12  
E: sales@kctgrab.com  
W: www.kctgrab.com

## KIEPE ELECTRIC GMBH

Kiepe-Platz 1  
Düsseldorf  
D-40599  
Germany  
**Contact:** Mr Rainer Luehring  
**Job Title:** Head of Sales Industrial Components  
T: + 49 211 7497 265  
F: + 49 211 7497 1265  
E: info@kiepe-elektrik.com  
W: www.kiepe-elektrik.com  
Vossloh Kiepe is a leading supplier of pull wire switches, belt drift switches and speed monitoring devices for the control of belt conveyor systems. The trade mark KIEPE is worldwide a synonym for proven products of highest quality.

## 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  
Other equipment: Vibrating Feeders and Conveyors; Bin Activators, Storage Pile Dischargers, Rail Car Dischargers and Densifiers, Fluid Bed Dryers and Coolers, Vibrating Spiral Elevators.  
Kinergy Corporation is a vibratory machine manufacturer designing, engineering and fabricating machines for capacities ranging from pounds per hour to several thousand tons per hour. Manufacturers of 'Induced Vertical Flow' and 'Induced Conveying' units using vibration.

## KINGFISHER INDUSTRIAL LTD

Cradley Business Park  
Overend Road  
Cradley Heath  
West Midlands  
B64 7DW  
UK  
**Contact:** Ms Anita Chumber  
**Job Title:** Sales & Marketing Executive  
T: + 44 1384 410777  
F: + 44 1384 410877  
E: achumber@kingfisher-industrial.co.uk  
W: www.kingfisher-industrial.co.uk  
Kingfisher specialise in protecting process plant and equipment against wear and abrasion. Offering a complete range of systems to cater for the harshest of operational environments, priding ourselves on offering industry an unbiased solution to the

problems encountered when handling or processing bulk solid materials.

## KINSHOFER GMBH

Hauptstrasse 76  
Waakirchen  
Bavaria  
D-83666  
Germany  
**Contact:** Mr Martin Locher  
**Job Title:** Marketing  
T: + 49 8021 8899 2520  
F: + 49 8021 8899 37  
E: m.locher@kinshofer.com  
W: www.kinshofer.com  
Other Equipment: Open and closed Rehandling Buckets, Special Grabs for Timber and Tubes, for Ballast, Rails and Sleepers, Hydraulic Hooks, Big Bag Handlers, Manipulators.

## KIRUNA WAGON AB

Truckverkstaden  
Kiruna  
981 86  
Sweden  
**Contact:** Mr Daniel Kangas  
T: + 46 70 226 26 56  
E: daniel.kangas@headmark.com  
W: http://kirunawagon.com/

## KLEEMANN GMBH

Hildenbrandstr.18  
Goppingen-Faurndau  
D-73035  
Germany  
**Contact:** Mr Mark Hezinger  
**Job Title:** Marketing  
T: + 49 7161 206 0  
F: + 49 7161 206 100  
E: info@kleemann.info  
W: www.kleemann.info

## KNIGHT ENERGY SERVICES LIMITED

Eccleston Grange  
Prescot Road  
St Helens  
Merseyside  
WA10 3BQ  
UK  
**Contact:** Ms Vallery Head  
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T: + 44 1744 733757  
F: + 44 1744 27062  
E: val.head@ahkgroup.com  
W: www.ahkgroup.com/

## 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.com  
Joy crushing and conveying solutions serve the ports, power, surface aggregates, tunnelling, construction and mining industries. Komatsu Mining Corp. also manufactures, sells and services other products and services that help make

customer operations safer and more productive.

## KONECRANES (FRANCE)

47 bis Boulevard de Graviolle  
B.P. 727  
Le Havre  
Cedex  
76060  
France  
**Contact:** Mr Gerard Lesueur  
T: + 33 2 35 25 95 14  
F: + 33 2 35 25 95 82  
E: gerard.lesueur@konecranes.com  
W: www.konecranes.com  
Provides complete crane service worldwide for all types and makes of harbour and shipyard cranes. These services include: inspections, maintenance, spare parts, engineered parts, repairs, modernisation/refurbishment, moves/relocations and second hand cranes.

## KONECRANES FINLAND CORPORATION

PO Box 662  
(Koneenkatu 8)  
Hyvinkää  
FIN-05801  
Finland  
**Contact:** Mr Jari Itäkodes  
**Job Title:** Product Manager, Shipyard and Bulk Handling Cranes  
T: + 358 40 768 8258  
F: + 358 20 427 2599  
E: jari.itakodes@konecranes.com  
W: www.konecranes.com  
Konecranes is a world-leading group of Lifting Businesses™, serving a broad range of customers, including manufacturing and process industries, shipyards, ports and terminals. Regardless of your lifting needs, Konecranes is committed to providing you with lifting equipment and services that increase the value and effectiveness of your business. See more information on www.konecranes.com

## KONECRANES HAFENTECHNIK GmbH

Mühlenfeld 20  
Hagen  
D-30853  
Germany  
**Contact:** Mr Dirk Groth  
**Job Title:** Manager Marketing & Sales Support  
T: + 49 511 7704 418  
F: + 49 511 7704 477  
E: info-hafentechnik@konecranes.com  
W: www.konecranes.de  
Provides a complete crane service worldwide for all types and makes of harbour and shipyard cranes. These services include inspections, maintenance, spare parts, engineered parts, repairs, modernisation/refurbishment, moves/relocations and second hand cranes.

## KONECRANES PORT SOLUTIONS - KONECRANES GmbH

**KONECRANES**  
Lifting Business

Forststrasse 16  
Düsseldorf  
D-40597  
Germany  
**Contact:** Mr Giuseppe Di Lisa  
**Job Title:** Sales & Marketing Director  
T: + 49 211 7102 3771  
F: + 49 211 7102 3651  
E: ps.info@konecranes.com  
W: www.konecranes.com  
FOR GREATER BULK HANDLING PRODUCTIVITY Reach out and grab it with eco-efficient Konecranes Gottwald Mobile Harbor Crane technology. Depending on site and operating conditions, our four-rope grab cranes, also available as rail-mounted portal

and floating cranes, achieve handling capacities of up to 2,000 tph in continuous-duty bulk handling. Our broad range of products with their smart crane features is supported by dedicated planning and consultancy services and backed by a global service network.

## KPI-JCI AND ASTEC MOBILE SCREENS

700 West 21st Street  
Yankton  
South Dakota  
57078  
USA  
**Contact:** Mr Daniel Filsinger  
**Job Title:** Customer Development Manager  
T: + 1 605 668 2621  
E: danielfilsinger@kpjici.com  
W: www.kpji.com  
KPI-JCI and Astec Mobile Screens have been leaders in the aggregate, mining, industrial, construction and recycling industries for over 90 years. As Astec Industries companies, we design and manufacture innovative, productive, reliable and safe equipment, coupled with unparalleled customer service.

## KRECH OJARD & ASSOC

227 W 1st St  
Suite 200  
Duluth  
Minnesota  
55082  
USA  
**Contact:** Mr Kevin Ehrenreich  
**Job Title:** Director Infrastructure Services  
T: + 1 218 727 3282  
F: + 1 218 727 1216  
E: kevin.ehrenreich@krechojard.com  
W: www.krechojard.com

## KRÖGER

## GREIFERTECHNIK GmbH & Co. KG

Steinheide 1-9  
Sonsbeck  
D-47665  
Germany  
**Contact:** Dr Philipp Diekmann  
**Job Title:** Managing Director  
T: + 49 2838 3750  
F: + 49 2838 3729  
E: info@kroeger-greifertechnik.de  
W: www.kroeger-greifertechnik.de  
Manufacturer of grabs of all types since the year 1962. Main products - two and four rope grabs, hydraulic grabs, electro hydraulic grabs from 0.5-25m3.

## LAING O'ROURKE

825 Ann Street  
Brisbane  
Queensland  
4105  
Australia  
**Contact:** Mr Josh Murray  
T: + 61 7 3223 2303  
F: + 61 7 3223 2300  
E: rlayton@laingorourke.com.au  
W: www.laingorourke.com.au  
One of the world's most dynamic and innovative privately owned development, construction and specialist companies. Acquired Barclay Mowlem in 2006, thereby providing additional scale, resources and capability. Offers a Total Solution Partner - bringing finance, development, design, construction and maintenance solutions to clients throughout Australia and the Asia Pacific region.

## LARSEN & TOUBRO LIMITED

Monunt Poonamallee Road  
Manapakkam  
PB No.979  
Chennai  
600089  
India  
**Contact:** Mr Kumar Vikram  
**Job Title:** ECC Division  
T: + 91 44 2252 6250  
F: + 91 44 22526993  
E: kvikram@lntec.com  
W: www.larsentoubro.com

## LASSING DIBBEN CONSULTING ENGINEERS LTD

PO Box 472  
Trenton  
Ontario  
K8V 5R6  
Canada  
**Contact:** Mr David Jesse  
**Job Title:** Projects Manager  
T: + 1 613 398 0007  
F: + 1 613 394 4173  
E: info@lassingdibben.com  
W: www.lassingdibben.com  
Award winning consulting engineers, specialising in bulk material handling. Extensive experience around the world means the company can handle all aspects of system design. Projects include shiploading and unloading equipment for coal and coke, stackers, conveyor systems and storage facilities.

## 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 fabricator and distributor of TIVAR 88 polymer liners. TIVAR 88 is a low coefficient of friction liner that is used to eliminate sticking, pluggage, ratholing material build-up. TIVAR 88 has excellent wear properties.

## 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 Building Solutions designs, manufactures, engineers, and installs large-scale custom fabric structures for a wide range of industries. A pioneer in the use of a rigid steel frame for fabric structures, the company has achieved ISO 9001:2008 and CSA-A660 certifications.

## 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: librانengineering@gmail.com  
W: www.libranengineering.com

## LIEBHERR-HYDRAULIKBAGGER GmbH



Liebherrstrasse 12  
Kirchdorf  
88457

Germany  
**Contact:** Mr Thomas Baeuerle  
**T:** + 49 7354 80 0  
**F:** + 49 7354 80 7294  
**E:** info@hb.liebherr.com  
**W:** www.liebherr.com  
A member of the Liebherr Group and manufacturer of hydraulic material handlers.

## LIEBHERR-MCCTEC ROSTOCK GmbH

(Liebherr Mobile Harbour Cranes)  
Liebherrstr. 1

Rostock  
18147  
Germany

**Contact:** Mr Leopold Berthold  
**Job Title:** Sales Director  
**T:** + 43 50809 41725  
**F:** + 43 50809 41447  
**E:** mobile.harbour.crane@liebherr.com

**W:** www.liebherr.com  
With 7 models available (42 - 208 tonnes capacity), Liebherr offers a wide range of cranes for dedicated coal handling. Due to optimized opening/closing and hoisting speeds, simultaneous functions, increased filling degrees, electronically controlled winch synchronisation etc., outstanding handling figures are being achieved.

## LION BULK HANDLING

**B.V.**

Global Headquarters  
Noord 101

Krimpen aan de Lek  
Amsterdam  
2931 SJ  
The Netherlands  
**Contact:** Mr Marcel van Rangelrooij  
**Job Title:** CEO  
**T:** + 31 180 440 720  
**F:** + 31 180 516 064  
**E:** news@lionbulkhandling.com  
**W:** www.lionbulkhandling.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  
Other equipment: loading equipment, filters.

## LYCOPDIUM

163 Leichhardt St  
Spring Hill  
QLD  
4171

Australia  
**Contact:** Mr Mark Osborne  
**Job Title:** Engineer  
**T:** + 61 7 3244 7777  
**F:** + 61 7 3244 7788  
**E:** mminerals@lycopodium.com.au  
**W:** www.lycopodium.com.au

## 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:** webinquiry@macawber.com  
**W:** www.macawber.com

## MACGREGOR GROUP

Hallimestarinkatu 6  
Kaarina  
20780  
Finland

**E:** macgregor@macgregor.com  
**W:** www.macgregor.com  
MacGregor offers world-leading engineering solutions and services with strong MacGregor, Hallapa, Porsgrunn, Pusnes and Triplex brands 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 SWE AB

Sjögatan 4G  
Ornsköldsvik  
SE-891 85  
Sweden

**Contact:** Mr Mikael Hägglund  
**Job Title:** Manager, Transloading and Self unloading systems  
**T:** +46 660 294 096  
**F:** +46 660 12455  
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**W:** www.macgregor-group.com

## 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  
Manufactures all types of grabs and grapples, both wire rope and hydraulically operated, as well as radio-controlled and diesel operated systems.

## MACTENN SYSTEMS LTD.

One Bull Lane  
Acton  
Sudbury  
Suffolk  
CO10 0BD  
UK

**Contact:** Mr Lee Suckling  
**Job Title:** Director, Sales & Application Engineering  
**T:** + 44 1787 882 422  
**F:** + 44 1787 882 433  
**E:** sales@mac Tenn.com  
**W:** www.mactenn.com  
Sales and manufacturing of dense-phase pneumatic conveying systems. World-wide reputation for successfully handling bulk materials in low velocities. 30,000 systems operating throughout the world in all process industries. Customer benefits include process cost savings and increased process reliability.

## MANTSINEN GROUP LTD OY

Vaikankaantie 3  
Ylamylly  
FIN-80400  
Finland

**Contact:** Ms Mari Riissanen  
**Job Title:** Marketing Coordinator  
**T:** + 358 20 755 1230  
**E:** mari.riissanen@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 HybrLift® 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, Subcontracting.

## MARINE INSPECTION LLC

621 North Carrollton Avenue  
New Orleans  
LA  
70119  
USA

**Contact:** Mr Robert Drew  
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**W:** www.marineinspection.com

## MARTIN ENGINEERING

One Martin Place  
Neponset  
Illinois IL 61345  
USA

**Contact:** Mrs Chelsea Blake  
**Job Title:** Marketing  
**T:** + 1 309 852 2384  
**F:** + 1 800 814 1533  
**E:** chelseaab@martin-eng.com  
**W:** www.martin-eng.com  
Martin Engineering makes bulk material handling cleaner, safer and more productive, improving belt conveyors by suppressing dust, reducing spillage, removing carryback and tracking belts. Specialists in belt cleaners, air cannons, vibration, transfer point technologies, dust management, railcar unloading, silo cleaning.

## MARTIN ENGINEERING GmbH

In der Rehbach 14  
Walluf  
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D-65396  
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**Contact:** Mr Joachim Preiß  
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**T:** + 49 61 23 978 221  
**F:** + 49 61 23 75 5 33  
**E:** info@martin-eng.de  
**W:** www.martin-eng.de

Since 1944 Martin Engineering has been a worldwide leader in making Bulk Material Handling cleaner, safer and more productive. Other equipment: Field Services, Safety Products, Flow Aids, Screen Vibrators

## 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, Pneumatic Docking Devices and even Railcar Dumping Systems for economical unloading of trains with open railcars.

## BULK LOADING TECHNOLOGIES

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**+49 (0)8034 9072-0**

Muhr GmbH  
Grafenstraße 27  
83098 Brannenburg/Germany

info@muhr.com

**BULK LOADING SYSTEMS**  
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CSR Cascade System

The flexible and world-wide largest product range. Closed, open, combined. Of course dust-free. With individual adaption modules. More efficiency due to a reduction of operating cost by up to 50 %.

**RAILCAR DUMPERS**  
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Dumps up to ten railcars at the same time without a height limit. Space-saving due to the unique Muhr compact design. More flexible and more efficient.



## MATRIX PDM ENGINEERING

5100 E Skelly Drive  
Suite 100  
Tulsa, OK 74135  
USA

**Contact:** Ms Lesley Windler  
**Job Title:** Marketing Manager  
T: + 1 918 838 8822  
E: lwindler@matrixservicecompany.com  
W: www.matrixpdm.com  
Matrix PDM Engineering, a subsidiary of Matrix Service Company (Nasdaq: MTRX) provides multi-disciplinary engineering, procurement and construction management services to the energy, power and industrial markets in North America and around the world.

## MEGADOME® BUILDINGS BY HARNOIS



1044 Principale  
St-Thomas  
Saint-Thomas  
Quebec  
J0K 3L0  
Canada

**Contact:** Ms Sara Larin  
**Job Title:** Coordonnatrice Marketing  
T: + 1 450 756 1042  
E: s.larin@harnois.com  
W: www.megadomebuildings.com  
Megadome® Buildings, a division of Harnois Industries Manufacturer of innovative steel structures that meet the highest engineering standards and that enable our customers to acquire sustainable and cost-effective storage buildings.

## MEGAROLLER

17 Murphy Street  
O'Connor  
Canberra WA 6163  
Australia

**Contact:** Mr Jannie Kotze  
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T: + 61 8 9314 5000  
F: + 61 8 9314 5500  
E: sales@megaroller.com.au  
W: www.megaroller.com.au

## MENTOR DYNAMICS

170 Penrod Court  
Glen Burnie  
Maryland 21061  
USA

**Contact:** Mr Don Watts  
**Job Title:** President  
T: + 1 410 760 6349  
F: + 1 410 760 8284  
E: info@mentordynamics.com  
W: www.mentordynamics.com  
Leading supplier of cargo hold liners for self unloaders, barges, and other bulk material storage & handling equipment. Products include Dyna-Flo high performance plastic liners and ceramic wear liners.

## MERRICK INDUSTRIES

10 Arthur Drive  
Lynn Haven  
FL 32444  
USA

**Contact:** Mr Erik Nolte  
**Job Title:** Sales Manager  
T: + 1 850 265 3611  
F: + 1 850 265 9768  
E: info@merrick-inc.com  
W: www.merrick-inc.com  
Merrick Industries is a leader in continuing and feeding solutions, since 1908. Merrick designs, manufactures, and supports all of our products at our Lynn Haven, Florida plant for the Coal, Cement, Mining, Chemicals, Lime, Gypsum, Steel and Aggregates industries.

## 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 include stacker/reclaimers; railcar dumpers/wagon tippers; grab, continuous and balance unloaders; barge/ship loaders; barge and train positioning systems; mechanical ash handling systems; coal preparation equipment; apron feeders and overland conveyor systems.

## MIDECO

22/137-145 Rooks Road  
Nunawading  
Victoria 3131  
Australia

**Contact:** Mrs Olha Lyeskakova  
**Job Title:** Chief Marketing Officer  
T: + 61 3 8873 0200  
F: + 61 438 859 178  
E: sales@mideco.com.au  
W: www.mideco.com.au  
Mideco provide dust control products and solutions for mines, quarries and any commercial environment since 1950. With 60 years of expertise in the dust extraction industry Mideco can design and implement a dust suppression solution for the most challenging projects.

## MIDWEST INDUSTRIAL SUPPLY INC

1101 3rd St. SE  
Canton  
Ohio OH 44707  
USA

**Contact:** Ms Liz Campbell  
**Job Title:** Marketing  
T: + 1 330 456 3121  
F: + 1 330 456 3247  
E: liz.campbell@midwestind.com  
W: www.midwestind.com  
Provide a complete line of dust control, erosion control, soil stabilization lubricants, anti-icing and de-icing products that are developed by the company staff of chemists and backed by a complete range of services, equipment, expertise and technical support since 1975.

## 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  
Founded in 1967, the company focuses on dust free loading and stockpiling of dry bulk with products including The Paragon Series and the Heavy Duty Mining Series. The Chokefeeder® dust free shiploading systems are used by governments and industries in over 50 countries.

## MITSUI MIIKE MACHINERY CO., LTD.

Nihonbashi-Muromachi 2-1-1  
Chuo-ku  
Tokyo  
103-0022  
Japan

**Contact:** Mr Hachiro Naito  
**Job Title:** General Manager, Material Handling Machinery  
T: + 81 3 3270 2001  
F: + 81 3 3245 0203  
E: soumu@mitsuimiike.co.jp  
W: www.mitsuimiike.co.jp

## MOBILE CONVEYING SYSTEMS

631 Uhlmann Rd

Burpengary  
QLD  
4505  
Australia  
T: + 61 1300 665 409  
E: enquiries@mobileconveyors.com.au  
W: www.mobileconveyors.com.au

## MOFFATT & NICHOL

5th Floor  
34 Lime Street  
London  
EC3M 7AT  
UK

**Contact:** Ms Rachel Bishop  
**Job Title:** Admin Assistant  
T: + 44 1252 516 398  
E: rbishop@moffattnichol.com  
W: www.moffattnichol.com

## 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  
In addition: Silo cleaning services and equipment. Silo, bin, bunker, transport and process vessel cleaning, clearing and unlogging services and equipment.

## 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.org  
W: www.monolithic.org/

## MOTHERWELL AUTOMATION

10 Sangiorgio Court  
Osborne Park  
West Perth  
WA  
6017  
Australia

**Contact:** Mr Chris Watson  
**Job Title:** Financial Manager  
T: + 61 8 9212 4444  
F: + 61 8 9212 4479  
E: ttowensend@motherwell.net.au  
W: www.motherwell.net.au

## MOTION METRICS

101-2389 Health Sciences Mall  
Vancouver  
British Columbia  
V6T 1Z3  
Canada

**Contact:** Ms Jodie Davies  
**Job Title:** Marketing Manager  
T: + 1 604 822 5842  
F: + 1 604 677 5191  
E: jodie@motionmetrics.com  
W: www.motionmetrics.com

## MOTRIDAL SPA

Via Pietro Bubba 17  
Piacenza  
Piacenza  
29122  
Italy

**Contact:** Mr Giampietro Calvi  
**Job Title:** Sales Director  
T: + 39 0523 59 66 11  
F: + 39 0523 59 01 28  
E: motridal@motridal.com  
W: www.motridal.com  
Specialist, with over 50 years experience, in heavy-duty, high-capacity machines, intended for operating under severe conditions in cement factory, steel works, power plant, aluminium smelter... Product line includes screw, chain, belt and pipe conveyors, bucket elevators, stackers.

Worldwide operation.

## MRS GREIFER GmbH

Talweg 15-17  
Helmsstadt-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 more than 40 years experience in producing all types of grabs. The company's product range includes mechanical grabs, radio-controlled, hydraulic and electro-hydraulic grabs. MRS has an excellent after-sales and repair service, provides spare parts from stock and supplies parts for a long period after delivery.

## NANTONG UP MACHINERY ENGINEERING Co., LTD

No.6 Shuangong Road  
Qutang Town  
Hai'an County  
Nantong City  
Jiangsu Province  
China

**E:** jsntup@163.com  
**W:** www.upmachinery.com.cn

## NATIONAL PORTS CORPORATION LIMITED

2 Birksgate Road  
Rous Head, North Fremantle  
Perth  
Western Australia  
6159  
Australia

**Contact:** Mr Alberto Simeone  
T: + 61 8 9435 8000  
E: asimeone@nationalports.com  
W: www.nationalports.com

## NATURAL GRABS

Toros Caddesi Fethi bey sokak no 11  
Natural Business Center  
Maltepe  
Istanbul  
Turkey

**Contact:** Cpt 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:** Ms Ann Hutchinson  
T: + 1 832 467 3636  
F: + 1 832 467 3800  
E: ben@navco.us  
W: www.navco.us

## NEGRINI SRL



via E. Torricelli n.4  
Castelfranco Emilia  
Modena  
41013  
Italy

**Contact:** Mr Massimo Negrini  
**Job Title:** Managing Director  
T: + 39 059 923110  
F: + 39 059 920378  
E: info@negrini.org  
W: www.negrini.org  
Engineers and producers of state-of-the-art grabs, clamshells and buckets.

## 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  
Specialized in the sales, engineering and construction of rope operated grabs for large scale dry bulk handling. The company has a vast record of worldwide deliveries and is recognized as one of the leading grab manufacturers worldwide. Other equipment: NEMAG Quick Release Links and Rope Pear Sockets.

## NEPEAN CONVEYORS Ov



Keskikankaantie 19  
FI-15860 Hollola  
Finland

**Contact:** Mr Reijo Kipeläinen  
**Job Title:** General Manager  
T: +358 10 406 1300  
E: info.fi@roxon.fi  
W: www.roxon.com  
ROXON offers maximum productivity through total material handling solutions. ROXON is an expert in belt conveyors, link conveyors, apron feeders, belt feeders, stackers, reclaimers, loading hoppers, shiploaders, conveyor components, service and modernization. Please visit www.roxon.com for more information.

## 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  
NERAK Continuous Bucket Conveyors are designed for combined horizontal and vertical conveying. Each bucket is securely attached to adjacent buckets and located between two steel reinforced rubber block. The assembly with no moving parts is capable of high conveying rates.

## 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 designs and manufactures a wide range of pneumatic and mechanical ship/barge unloaders, ship/barge loaders and pneumatic conveyors, with high capacities and gentle handling of materials.

## NILOS GmbH & Co KG

Reisholzstrasse 15  
PO Box 970  
Hilden 40709  
Germany

**Contact:** Mr Jens Hamacher  
**Job Title:** Export Manager  
T: + 49 2103 9510  
F: + 49 2103 951 209  
E: jens.hamacher@nilos.de  
W: www.nilos.com  
Conveyor belt equipment ranges from simple small tools to vulcanising presses up to the planning, construction and commissioning of complete conveyor belt repair workshops. Range of products include hot and cold repair material, along with basic

overhauling, reconditioning, maintenance and assemblies.

## NK TEHNOLOGIJA SIA

120Z Dzlezavass Street  
Riga LV-1021  
Latvia

**Contact:** Mr Andrew Oleynik  
**Job Title:** Marketing & Publications  
T: + 371 67271092  
F: + 371 67271038  
E: nkteh@nkteh.lv  
W: www.nkteh.lv  
Custom design and integrated solutions for dry bulk handling: shiploaders, dry bulk terminals, terminal efficiency analysis & development. Assembling, disassembling, service & maintenance of crane equipment.

## NKM NOELL SPECIAL CRANES GmbH

Kruisweg 643  
Hoofdorp 2132 NC  
The Netherlands

**Job Title:** Marketing Manager  
T: + 31 20 655 0030  
F: + 31 20 655 0040  
E: sales@nkmnoell.com  
W: www.nkmnoell.com/  
Company is specialized in special cranes. For the bulk industry the knowledge is concentrated on floating lenticulate cranes and terminals.

## NM Heilig BV

Newtonstraat 17  
Heerhugowaard 1704 SB  
The Netherlands

**Contact:** Mr G. S. Dwaarsweerd  
**Job Title:** Head of Sales Department  
T: + 31 72 571 6688  
F: + 31 72 571 6020  
E: info@heiligbv.com  
W: www.heiligbv.com  
Heilig Holding is a company group based in Europe specialized in manufacturing bulk handling and recycling systems.  
- Custom design and engineering  
- High quality manufacturing facilities  
- Experienced Assembly and service staff  
We are 35 years on the market, privately owned family company with over 250 employees.  
Other Equipment: Mobile (on tracks) stackers, conveyors and feeders

## NMH S.R.O

Priemyselná 4608/10  
Sereď 926 01  
Slovakia

**Contact:** Ms Veronika Kremľ  
**Job Title:** Marketing Manager  
T: + 42 131 230 4441  
E: v.kremľ@nmh-sro.com  
W: www.nmh-sro.com

## NKM NOELL

Kruisweg 643  
Hoofdorp  
2132 NC  
The Netherlands

**Contact:** Mr Mattijs Faber  
**Job Title:** Business Development Manager  
T: +31 20 6556385  
E: Mattijs.faber@nkmnoell.com  
W: www.reel.fr  
At NKM Noell we are driven by offering our clients solutions with which they can make a difference in their operational process. By working closely together with our clients, we develop the optimal solution for any specific requirement. Whether it concerns a turnkey system, standalone equipment or life cycle services we are a reliable partner. We provide innovative and efficient solutions for floating bulk transshipment.



T: + 1 270 442 1996  
F: + 1 270 442 5214  
E: sales@pebco.com  
W: www.pebco.com  
PEBCO® is acknowledged throughout the world in the field of moving, controlling and loading dry bulk materials. Resources and responsibilities include customized gates and valves, mass flow feeders, dustless loading spouts, telescopic chutes, PEBCO® Cascade® chutes and truck, ship, railcar and barge loadouts.

## PEINEMANN CRANES

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  
Other equipment: Container Spreader  
Manufacturer and supplier of a wide range of grabs and other lifting equipment, e.g. motor grabs, single-, two- and four-ropes grabs, scissor grabs, hydraulic grabs as well as rotators and special grabs for all kinds of bulk materials in a variety of industries, such as ports, ships, steel mills, waste-to-energy plants and recycling businesses.

## PETERSON AGRICARE & BULK LOGISTICS

Boompjes 270  
Rotterdam  
3011 XZ  
The Netherlands  
Contact: Mr Aro Maehlimann  
T: + 31 10 282 3333  
F: + 31 10 282 3282  
E: info@peterson.nl  
W: www.peterson.nl

## PFISTER WAAGEN BILANCIAL GMBH

Linker Kreuthweg 9  
Affing-Mühlhausen  
D-86444  
Germany  
Contact: Ms Susanne Geller-Dür  
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  
Founded in 1894 as a manufacturer of mechanical weighbridges. Suppliers of innovative, high quality, fully electronic weighing systems, incorporated in data networks, capturing and processing weighing data in cost-efficient control systems. Specialized in truck weighbridges, railway scales, weighing software.

## 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: + 34 984 495 640 / + 34 984 49 55 00  
F: + 34 985 134 222  
E: joseramon.prado@pwh.es

W: http://www.grupotsk.com/  
Efficient port systems, handling all types of bulk solids such as coal, iron ore, bauxite, fertilizers, clinker, cement and general cargo, with different solutions for maritime or river ports. Design of circular or longitudinal stockyards combining a wide range of reclaimers and different types of stackers.

## PHOENIX CONVEYOR BELT SYSTEMS GMBH

Hannoversche Strasse 100  
Hamburg 21079  
Germany  
Contact: Mr Danny Slonka  
T: + 49 40 7667 03  
F: + 49 40 7667 2413  
E: info@phoenix-cbs.com  
W: www.phoenix-conveyorbelts.com  
With more than 110 years of experience, the world leader for high performance heavy-duty conveyor belts, serving the worldwide bulk handling industry. The programme includes textile and steel cord conveyor belts for underground and surface applications.

## PINTSCH BUBENZER GMBH

Friedrichshüttenstraße 1  
Kirchen-Wehbach  
RLP  
57548  
Germany  
Contact: Ms Tanja Zimmermann  
Job Title: Management Assistant  
T: + 49 2741 9488 481  
F: + 49 2741 9488 44  
E: Tanja.Zimmermann@pintschbubenzler.de  
W: www.pintschbubenzler.de  
BRAKING UNLIMITED - PINTSCH BUBENZER is focused on the design, production and service of high quality braking systems for both static and dynamic applications. We offer innovative new developments, customer-oriented action and a world-wide sales and service network.

## 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  
Storage solutions for dry bulk commodities, including coal.

## PIV DRIVES GMBH - DANA INCORPORATED

Justus-von-Liebig-Straße 3  
Bad Homburg  
D-61352  
Germany  
Contact: Mr Christoph Höhr  
Job Title: Director Sales Germany  
T: + 49 6172 102 450  
F: + 49 6172 102 8807  
E: Christoph.Hoehr@dana.com  
W: www.brevini.com  
PIV Drives, a company of Dana, has 90 year experience in providing quality power transmission solutions for every industry sector. PIV Drives developed modular concepts for its comprehensive product range, providing the flexibility to deliver high-quality optimised solutions, both standard and bespoke, quickly and at competitive cost.

## PLM CRANES B.V.

Sluisweg 21-25  
Heijningen

## NOELL CRANE SYSTEMS (CHINA) LTD

China Merchants  
Zhangzhou Development Zone  
Fujian 363105  
China  
T: + 86 596 6851 888  
F: + 86 596 6851 889  
E: xia.info@terexnoell.com  
W: www.noellchina.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

## NORTH AMERICAN CRUSHING & SCREENING, LLC

322 Lafayette Street  
New Orleans  
Louisiana  
LA 70130  
USA  
Contact: Mr Gilbert Wright  
T: + 1 504 866 0014  
F: + 1 504 866 0016  
E: gwright@naacslc.com  
W: www.naacslc.com  
Contract processing services (crushing and screening) for all types of heavy bulk cargo. Also reconditions soft commodities offering solutions for distressed cargo. Processing and reconditioning equipment is designed for mobile operations and can be relocated to almost any site.

## NSL ENGINEERING PTE LTD

117 Dalhousie St  
Haberfield  
Sydney  
NSW  
2045  
Australia  
Contact: Mr Cameron Hay  
Job Title: Sales & Marketing Manager  
T: + 61 297 972054  
F: + 65 626 11300  
E: cameron@ramspreaders.com  
W: www.ramspreaders.com/

## O.Z. HENNLICH ENGINEERING

HENNLICH s.r.o.  
Ceskolipská 9  
Litoměřice  
412 01  
Czech Republic  
Contact: Mr Jan Petruzalek  
Job Title: Sales Director  
T: + 420 416 711 357  
F: + 420 416 711 999  
E: engineering@hennlich.cz  
W: www.hennlich-engineering.com

## OFFSHORE BULK TERMINAL PTE LTD

50, Collyer Quay  
QUE Bayfront, #06-04  
Singapore 049321  
Singapore  
Contact: Ms Lohita Ellysiana  
E: lohita.elysiana@obt-group.com  
W: http://www.obt-group.com

## ORTHOS PROJECTS LTD.

Fernie Road  
Market Harbourough  
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  
Since 1977 Orthos Projects have designed, manufactured and installed bulk solids raw materials handling plant to the highest specification. Best qualified to serve the Port, Bulk Handling, Quarry, Foundry, Recycling and related industries. Special purpose machine design, conveyor systems to ISO 9001 (2008).

## 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  
Made in Germany: Electro-hydraulic grabs, independent diesel-hydraulic grabs, mechanical rope grabs. For bulk, scrap, dredging, salvage. Repairs (also grabs from other makers) and spare parts. Crane-equipment for electro-hydraulic grabs. Lifting beams (max. load 150t) and flat-frames.

## OXBOW ENERGY SOLUTIONS BV

Wilhelminakade 93  
Rotterdam  
3072 AP  
The Netherlands  
Contact: Mr Ewoud Colenbrander  
Job Title: Vice President International Operations  
T: + 31 104419200  
F: + 31 104360692  
E: Ewoud.Colenbrander@oxbow.com  
W: www.oxbow.com

## P.T. MITRA S.K. ANALISA TESTAMA

Pulogadung Trade Centre, Block 8H No 7  
Jl. Raya Bekasi Km 21  
Kawasan Industri  
Jakarta 13930  
Indonesia  
Contact: Ms Mien Hermina  
Job Title: Marketing Manager  
T: + 62 21 4680 1210  
F: + 62 21 4680 0716  
E: mina@mitrask.com  
W: http://www.mitrask.com/

## 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, Page Macrae Engineering is regarded as Australasia's leading manufacturer of ship cargo handling equipment. The company's bulk handling expertise covers the complete

concept, design, build and commission process. The company has a reputation for delivering high quality equipment that is robust, low maintenance and highly productive, regardless of conditions and loads.

## PAKIET

82-103 Stegna  
Rybina 43  
Gdansk  
Poland  
Contact: Mr Piotr Rzeszutek  
Job Title: Director  
T: + 48 55 247 17 70 ext.32  
E: patrycja@pakiet.com  
W: https://pakiet.com

## PARKER HANNIFIN MANUFACTURING LTD.

President Park  
President Way  
Sheffield  
South Yorkshire S4 7UR  
UK  
Contact: Mr Gary Wain  
Job Title: Piping Product Marketing Manager  
T: + 44 0114 224 0000  
E: gary.wain@parker.com  
W: www.parker.com  
Bretby equipment is important as poor-quality coal with high ash content could be rejected, at huge cost. Our products are accurate compared to laboratory analysis enabling real time decision making. Coal Quality Monitoring Systems, Dust Suppression, Conflow and Bestobell valves.

## PARKER PLANT LTD

Viaduct Works  
Canon Street  
Leicester  
Leicestershire LE4 6GH  
UK  
Contact: Mr Richard Fothergill  
Job Title: Marketing Manager  
T: + 44 116 266 5999  
F: + 44 116 261 0812  
E: sales@parkerplant.com  
W: www.parkerplant.com  
Manufactures a complete range of conveyor systems and components.

## PEBCO®

PO Box 7506  
225 North 4th Street (42001)  
Paducah  
KY  
42002-7506  
USA  
Contact: Mr David Finke  
Job Title: VP, Sales and Marketing

4794 SW  
The Netherlands  
**Contact:** Mr Pieter Pulleman  
**Job Title:** Managing Director  
T: + 31 167 528510  
F: + 31 167 524444  
E: info@pimcranes.com  
W: www.pimcranes.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  
**Job Title:** Sales and Marketing Manager  
T: + 1 507 345 4553  
F: + 1 507 345 3639  
E: info@pneumat.com  
W: http://pneumat.com/  
Pneumat's equipment is designed to keep bulk flowing in your facility...safer, faster and easier. Our unique solutions are used worldwide to solve a wide array of flow problems.

## 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  
Tough, self-lubricating Ultra Poly Ultra High Molecular Weight polyethylene provides durable protection for metal surfaces and eliminates noise associated with metal-on-metal contact. And its slick, nonstick properties assure unimpeded flow of materials, even under wet, sticky or freezing conditions.

## PORTASILO LTD

New Lane  
Huntington  
York YO3 9PR  
UK  
**Contact:** Mr Fin Farrelly  
T: + 44 1904 624 872  
F: + 44 1904 611 760  
E: bulk@portasiilo.co.uk  
W: www.portasiilo.co.uk  
Designs, manufactures and installs bulk handling equipment for the storage and handling of powdered and granular materials. Equipment supplied includes silos, hoppers, mechanical conveyors, lean phase and dense phase pneumatic conveying systems. Full turn key solutions can be offered.

## 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  
Port-Trade is a Danish company with more than thirty years of experience with cargo handling systems, including mobile harbour cranes, container spreaders, bulk handling grabs, and loading equipment.  
Port-Trade provides analyses of customer requirements and proposes and delivers complete equipment solutions.

## POWERSCREEN

200 Coalisland Road  
Dungannon  
County Tyrone  
BT71 4DR  
Northern Ireland  
**Contact:** Mrs Dearbhaile Mullholland  
**Job Title:** Marketing  
T: + 44 288 77 18500  
F: + 44 288 77 47231  
E: sales@powerscreen.com  
W: www.powerscreen.com  
Powerscreen manufactures a complete range of mobile crushing, screening and conveying equipment. Over 50 machines meet the needs of customers operating in a wide range of applications: from aggregate and sand production to processing compost, construction and demolition waste and other recycled waste materials.

## PRECIA-MOLEN NEDERLAND BV

Frans 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  
At the forefront of the industry, has provided weighing solutions for more than 147 years and established a worldwide reputation for quality and reliability. The large product range consists of weighbridges; bulk, belt, bagging, platform and aircraft weighing check-in scales; load cells, indicators, controllers and truck dumpers.

## 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  
Continuous digital belt weighing and weigh feeding systems - capacities - 12,000 max tph, 9 m/s speed, 400-2400 belt widths.  
Batch weighing, Loss in weight, and Level weighing.

## PT ARMADA ROCK KARUNIA TRANSSHIPMENT

Menara Standard Chartered 9th Floor  
Jl. Prof. Dr. Satrio No. 164  
Jakarta  
12930  
Indonesia  
**Contact:** Ms Paula Anselmi  
**Job Title:** Marketing Executive  
T: + 62 812 9177 7342  
F: + 62 21 2553 2554  
E: enquiry@ark-transshipment.com  
W: www.ark-transshipment.com

## PT BUKAKA TEKNIK UTAMA

Jl. Raya Bekasi Nargong Km 19,5  
Cileungsi Bogor  
Jakarta 16820  
Indonesia  
**Contact:** Mr Achmad Kalla  
**Job Title:** Director  
T: + 62 21 823 1146  
F: + 62 21 823 2323  
E: bdv@bukaka.com  
W: www.bukaka.com

## PT CARSURIN

Neo Soho Capital Lt. 28  
Jl. Letjen S. Parman Kav. 28

Grogol Petamburan  
West Jakarta  
DKI Jakarta 11470  
Indonesia  
**Contact:** Mr Hal Loevy  
**Job Title:** Director Corporate Strategy & Business Development  
T: + 62 21 5022 6868  
F: + 62 21 5022 6868  
E: headoffice@carsurin.com  
W: www.carsurin.com  
Established in 1968, PT CARSURIN is the largest privately owned Inspection, Testing and Verification company in Indonesia, with a growing international presence. We provide independent third party services to mitigate risk for our clients across a broad range of industries including Coal. We are the only independent Indonesian member of the International Federation of Inspection Agencies and are the sole Lloyd's Agent in Indonesia.

## PT CCIC JAKARTA

Menara Citicon  
Jl. Letjen S. Parman Kav. 72  
Lantai 10, Suite E-F  
Silpi  
Jakarta 11410  
Indonesia  
**Contact:** Mr Eddy Kristianto  
**Job Title:** Assistant Marketing Manager  
T: + 62 21 2930 8911/22  
F: + 62 21 28930 8933  
E: ccic@ccicsg.com  
W: www.ccicsg.com

## PT GEOSERVICES

Jl. Setiabudi 79-81  
Bandung  
West Java 40291  
Indonesia  
**Contact:** Mr Peter Pramana  
**Job Title:** + 62 22 203 1316  
T: + 62 22 203 5433  
E: jktbranch@geoservices.co.id  
W: www.geoservices.co.id

## PT JAKARTA PRIMA CRANES

Wisma JPC  
Jl. Mampang Prapatan Raya No. 20  
Jakarta  
12760  
Indonesia  
**Contact:** Mr Tony Haryono  
**Job Title:** Branch Manager  
T: + 62 21 799 2772  
F: + 62 21 799 2442  
E: edy-siantur@jpc.co.id  
W: www.jpc.co.id

## PT MITRA BAHTERA SEGARASEJATI

Menara Karya 12th Floor  
Jl H R Rasuna Said Blok X-5  
Kav 1-2 Kuningan  
Jakarta  
12950  
Indonesia  
**Contact:** Mr Ferdinand Mapaye  
**Job Title:** Deputy Marketing Director  
T: + 62 21 5794 4755  
F: + 62 21 5794 4767  
E: ferdinand.mapaye@mbss.co.id  
W: www.mbss.co.id

## PT SPANSET INDONESIA

Jl. Marunda Center Blok F No.20  
Segara Makmur  
Tarumajaya  
Bekasi  
Jawa Barat  
14350  
Indonesia  
**Contact:** Mr Mario Harben  
**Job Title:** Business Development Manager  
T: + 62 21 28510077  
F: + 62 21 28510088  
E: sales@spanset.co.id  
W: www.spanset.co.id  
PT SpanSet Indonesia as one of the authorized distributor for Bridon, Kiswire, Usha Martin and Verop is the member of Association of Wire Rope Fabricators (AWRF). We always provide the highest

quality product and services in wire rope applications.

## PT THIESS CONTRACTORS INDONESIA

Ratu Prabu 2  
Ratu Prabu 2  
Jl. TB. Simatupang Kav. 18  
Jakarta  
12560  
Indonesia  
**Contact:** Mr Matahara  
**Job Title:** Business Development Manager  
T: + 62 21 2754 9999  
F: + 62 21 2754 9800  
E: thiess@thiess.co.id  
W: www.thiess.co.id

## PT. BANDO INDONESIA

Wisma Hayam Wuruk, 6th floor,  
Suite 600  
Jln. Hayam Wuruk No. 8  
Jakarta 10120  
Indonesia  
**Contact:** Mr Budi Widjaya  
**Job Title:** Mining Division  
T: + 62 21 3517590  
F: + 62 21 3517591  
E: vbelt.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.

## PT. THERMALINDO SARANA LABORATORIA

Jl. Daan Mogot II No. 100J  
Jakarta 11510  
Indonesia  
**Contact:** Mr Eduard Sasmita  
**Job Title:** Branch Manager  
T: + 62 21 566 3057  
F: + 62 21 566 2795  
E: edo@thermalindo.com  
W: http://www.thermalindo.com/

## QINGDAO HUAXIA RUBBER INDUSTRY CO. LTD.

No.146, Chingma Road  
Tongji District  
Jimo  
Qingdao  
Shandong  
266228  
China  
**Contact:** Mrs Molly Shi  
**Job Title:** Sales Manager  
T: + 86 137 8985 9616  
F: + 86 532 8251 9238  
E: conveyorbelt@huaxiarubber.cn, molly.shi@huaxiarubber.cn  
W: www.huaxiarubber.cn  
Qingdao Huaxia Rubber Industry Co., Ltd. supplied first-class quality rubber conveyor belts with competitive price to iron ores/copper/diamond mining, tunneling, metallurgy, steel works, ports. In ISO 15236, DIN 22102/DIN 122131, AS, SANS, BS, JIS standard.

## QML SRERVICES

Level 4, 251 Wharf Road  
Newcastle  
NSW  
2300  
Australia  
**Contact:** Mr Simon LeRougetel  
**Job Title:** Services Manager  
T: + 61 2 4908 2290  
E: info@qmlservices.com  
W: www.qmlservices.com  
QML Services provides outsourced logistics management services to the mining and resources industries. QML Services is part of the ION Group, utilising QMASTOR Commodity Management software. QMASTOR Metals and Mining solution reduces operational, logistical, marketing and commercial costs by managing the tonnage, quality and value

of coal and mineral supply chains.

## 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  
Polymer liners for self-unloading ships, hoppers, chutes, bins, railcars, silos. SystemTIVAR Engineering designs, fabricates and installs lining systems worldwide to promote bulk material flow, featuring industry-leading low coefficient of friction and abrasion-resistant TIVAR® family of products.

## QUALITY HANDLING SYSTEMS PTY LTD

6 Metters Place  
Wetherill Park  
Sydney  
NSW  
2164  
Australia  
**Contact:** Mr Peter Taylor  
**Job Title:** Project Manager  
T: + 61 2 9756 1921  
F: + 61 2 9756 4212  
E: ptaylor@qhs.com.au  
W: www.qhs.com.au  
Specialists in the design and supply of mechanical sampling systems for bulk materials. The company can also assist in the design and specification of new sampling systems and review existing systems to improve their reliability and accuracy.

## QUBE PORTS & BULK

Level 22  
44 Market Street  
Sydney  
NSW 2000  
Australia  
**Contact:** Mr Paul White  
**Job Title:** Media  
T: + 61 2 9005 1100  
F: + 61 2 9005 1101  
E: paul.white@qube.com.au  
W: www.qube.com.au/ports-and-bulk

## R & S SRL / RONCUZZI - WAM GROUP

Via del Cmapo Sportiuro 40  
Mezzana  
48123  
Italy  
**Contact:** Mr Michael Grass  
**Job Title:** Marketing Communications Manager  
T: + 39 0535 61 81 11  
F: + 39 0544 41 10 99  
E: Michael.Grass@wamgroup.com  
W: www.roncuZZi.com  
Designs and builds green hoppers, belt conveyors and transhipment plant for coal, cereals, mineral.

## RAM SMAG LIFTING TECHNOLOGIES

  
6 Selby Place  
Stanley  
Skelmersdale  
Lancashire  
WN8 8EF  
UK  
**Contact:** Mr Patrick Draper  
**Job Title:** PR & Communication  
T: + 44 1695 556355  
F: + 44 1695 556356  
E: p.draper@ramspreaders.com  
W: www.ramspreaders.com/  
RAM Spreaders, one of the leading manufacturers and suppliers of container handling

equipment for over 40 years have developed their environmental friendly RAM Revolver® for dust free containerized bulk handling solutions in association with specialist container suppliers.

## RAPAT ASIA

Clark, Philippines  
Angeles  
Pampapaga 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  
T: + 1 218 483 3344  
F: + 1 218 483 3535  
E: info@rapat.com  
W: http://www.rapat.com/

## 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.

## RC INSPECTION B.V

Gustoweg 66  
Rotterdam  
NL 3029  
The Netherlands  
**Contact:** Ms Birgit Bender  
**Job Title:** Sales and Marketing Manager  
T: + 31 610 742 140 / + 31 10 425 0237  
E: Birgit.Bender@rc-inspection.com  
W: www.rc-inspection.com/  
RC inspection is an independent inspection company for quality and quantity control in the market of Solid Fuels, Metals-Minerals, Scrap and Marine Surveys with offices all over the globe.

## REDAELLI TECNA S.P.A.

Via Volta, 16  
Cologno Monzese  
Milano 20093  
Italy  
**Contact:** Mr Emanuele Cortesi  
**Job Title:** Sales Representative  
T: + 39 02 253 07219  
F: + 39 02 253 07212  
E: emanuele.cortesi@redaelli.com  
W: www.redaelli.com

## 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/

## REMA TIP TOP AG

Gruber Straße 65  
Poing  
Bavaria D-85586  
Germany  
**Contact:** Mr Guido Weber  
**Job Title:** Global Head of Marketing & Corporate Communication

T: + 49 8121 707 77141  
 E: nfo@rema-tiptop.com  
 W: www.rema-tiptop.com  
 Materials developed and manufactured by REMA TIP TOP are installed and maintained by its service facilities around the world. It provides a full range of conveyor belt repair and splicing products, corrosion and wear protection products, modern vulcanising materials/methods and full laboratory testing and technical assistance.

## 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: info@rhc-deutschland.de  
 W: http://rhc-heavy-machinery.com/  
 RHC can provide a competitive package of different kinds of Material Handling Systems.

## RHC HEAVY MACHINERY LTD

China Office Shanghai  
 Lane 1288, Room 2004  
 Man Ma Yu Road  
 Pudong  
 Shanghai  
 China  
**Contact:** Mr Rolf Hofmann  
**Job Title:** Managing Director  
 T: + 85 2 8199 7916  
 F: + 85 2 822 62666  
 E: info@rhc-heavy-machinery.com  
 W: http://rhc-heavy-machinery.com/  
 RHC can provide a wide range of Coal Handling Equipment according international Standards and Components. Due to European Engineering and strict Quality Control we can provide a very competitive product to our clients. We would like to be at your service.

## RICHMOND ENGINEERING WORKS

1601 Parkway View Drive  
 Pittsburgh  
 PA  
 15205  
 USA  
 T: + 1 412 787 9640  
 F: + 1 412 787 9640  
 E: info@richmondengineering.com  
 W: www.richmondengineering.com

## RICHWOOD INDUSTRIES, Inc.

PO Box 1298  
 Huntington  
 West Virginia  
 25714-1298  
 USA  
**Contact:** Ms Kelley Barr  
**Job Title:** Marketing Manager  
 T: + 1 304 525 5436  
 F: + 1 304 525 8018  
 E: info@richwood.com  
 W: www.richwood.com

## RINA CONSULTING S.p.A.

Via Corsica, 12  
 Genoa  
 16128  
 Italy  
**Contact:** Mr Mario Terenzio  
**Job Title:** Managing Director  
 T: + 39 010 538 5723  
 W: www.rina.org  
 Logmarin's scope of business is to provide an integrated, comprehensive and tailor-made advisory service for marine terminals and associated handling infrastructures, both off-shore and on-shore. Logmarin individuals and its associates have pioneered dry-bulk shipping logistics off-shore, devising and designing innovative floating terminals, self unloading vessels and floating cranes, as well as on-

shore terminals.

## RINGSPANN GmbH

Schabenweg 30-34  
 Bad Homburg  
 61348  
 Germany  
**Contact:** Dr Holger Buchner  
**Job Title:** Managing Director  
 T: + 49 61 72275171  
 F: + 49 61 72275275  
 E: info@ringspann.de  
 W: www.ringspann.com


## RISUN TECHNOLOGIES

357 West 6160 South  
 Murray  
 Utah  
 84107  
 USA  
**Contact:** Mr Bill Whitney  
**Job Title:** Vice President,  
 Business Development  
 T: + 1 801 305 4241  
 F: + 1 801 281 8787  
 E: info@risuntech.com  
 W: www.risuntech.com

## ROBERTS & SCHAEFER COMPANY

222 South Riverside Plaza  
 Chicago  
 Illinois  
 60606-3986  
 USA  
**Contact:** Mr Ike Miller  
**Job Title:** Business Development  
 Mgr  
 T: + 1 312 236 7292  
 F: + 1 312 726 2872  
 E: rs@elginindustries.com  
 W: www.r-s.com

## ROCKTREE LOGISTICS PTE. LTD.

  
 3 Church Street  
 #24-01/02  
 Samsung Hub  
 Singapore  
 049483  
 Singapore  
**Contact:** Mr Daniel Miller  
 T: + 65 6622 6507  
 E: info@rocktree.sg  
 W: www.rocktree.sg  
 RockTree Logistics Pte. Ltd. Designs customised logistics that manage the complete transshipment aspect of your supply chain for all dry bulk commodities. Our goal is to get your dry bulk moving on schedule, saving you time and money in the process.

## RONIN GMS

No 1 Nobel Avenue  
 Modderfontein  
 Johannesburg  
 Gauteng  
 1645  
 South Africa  
**Contact:** Mr Ferdinand Meyer  
**Job Title:** Sales and Marketing  
 Executive, Ronin Group  
 T: + 27 11 608 3666  
 F: + 27 11 608 4679  
 E: ferdi@roningms.com  
 W: www.roninms.com  
 Ronin GMS provide bulk inventory management systems and moment in time audits for balancing real-time stock positions to stock positions on book. Our systems can be used in Silo's, warehouses and open air stock yards. Enrolling business partners worldwide.

## ROYAL HASKONING DHV

PO Box 8520  
 Rotterdam  
 3009 AM  
 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  
 Studies on

marketing/distribution/feasibility/management handling/storage/environmental impact. Design, procurement, tender evaluation, contract aware, on-site supervision. Has carried out projects in over 70 countries.

## RUBB BUILDINGS LTD

Dukesway  
 Team Valley Trading Estate  
 Gateshead  
 Tyne & Wear  
 NE11 0QE  
 UK  
**Contact:** Ms Clare Wilson  
**Job Title:** Marketing Director  
 T: + 44 191 482 2211  
 F: + 44 191 482 2516  
 E: info@rubb.co.uk  
 W: www.rubb.co.uk  
 Designs, manufactures and installs relocatable flat storage buildings. Structures are made from a frame consisting of hot dip galvanised steel and PVC impregnated polyester outer membrane. Structures can be supplied worldwide complete turnkey solutions to any bulk storage problem can be offered.

## RULMECA HOLDING S.P.A.

Via A Toscanini 1  
 Almè  
 Bergamo  
 24011  
 Italy  
**Contact:** Mr Carsten Spanggaard  
**Job Title:** Group Sales Director  
 T: + 39 035 430 0111  
 F: + 39 035 545 700  
 E: rulmeca@rulmeca.it  
 W: www.rulmeca.com  
 Specialises in the production of rollers, motorized pulleys and components. Rulmeca Group means: wide distribution networks; close relationships with customers and complete service; manufacturing flexibility; continuously expanding and evolving product range; constant improvement in technical, design and sales service; global market reach and a network of skilled agents.

## SABS - MINING & MINERALS

PO Box 413  
 Richards Bay  
 KwaZulu Natal  
 3900  
 South Africa  
**Contact:** Ms Audrey Ndlovu  
**Job Title:** Operations Manager  
 T: + 27 35 797 7212  
 F: + 27 35 797 7212  
 E: ndlovua@sabs.co.za  
 Provides a holistic range of sampling, analytical and product certification services to the solid-fuel and mineral industries. In addition to its core values of Accredited Quality (ISO 17025), integrity, accuracy and speed, also offered is a very competitive pricing structure resulting in product samples for analysis being received from around the world.

## SAMMI

Via Tuderte, 388  
 Narni Scalo  
 Terni  
 05036  
 Italy  
**Contact:** Mr Daniele Bellezza  
**Job Title:** Engineer  
 T: + 39 0744 733832  
 F: + 39 335 5313331  
 E: daniele.bellezza@sammi.it  
 W: www.sammi.it  
 In addition: Lime kilns equipment, Ceramic casting equipment  
 Sammi is a leading company in design, supply and installation of industrial plant, able to resolve customer's needs with a wide range of application, such as:  
 - Complete industrial plants  
 - Bulk handling equipment  
 - Off-shore conveyor systems

- Lime kilns  
 - Machine for the ceramic sector  
 In January 2012, acquired majority shareholder of PLANIA Ingegneria (Architectonic Engineering Planning); a company of professional civil, industrial engineers and architects, completing the competences already present at Sammi.

## SAMPLING ASSOCIATES

**INTERNATIONAL**  
 22 Enterprise Parkway  
 Suite 220  
 Hampton  
 Virginia  
 23666  
 USA  
**Contact:** Mr Paul Reagan  
**Job Title:** President  
 T: + 1 757 928 0484 ext 100  
 F: + 1 757 928 0482  
 E: preagan@samplingassociates.com  
 W: www.samplingassociates.com  
 SAI is a specialist in the operation and maintenance of mechanical sampling systems for coal, coke and petroleum coke in the Americas.

## SAMSON MATERIALS HANDLING LTD (AUMUND GROUP)

  
 Gemini House  
 Cambridgeshire Business Park  
 1 Bartholomew's Walk  
 Ely, Cambridgeshire  
 CB7 4EA, UK  
**Contact:** Mr Dale Lockley  
**Job Title:** Managing Director  
 T: + 44 1353 665001  
 F: + 44 1353 666734  
 E: sales@samson-mh.com  
 W: www.samson-mh.com  
 Experts in mobile bulk materials handling equipment for surface installation: from truck unloaders, to ship loaders, rail and barge loaders, ecological import hoppers and mobile stockpiling equipment. Hard-working equipment designed for rapid set-up and continuous high performance.

## SANDVIK MINING AND CONSTRUCTION (CHINA) CO., LTD.

No.986, Baota Rd  
 Jiading District  
 Shanghai  
 201821  
 China  
**Contact:** Mr Zhang Jianyuan  
**Job Title:** Vice President, Surface Mining  
 T: + 86 21 6916 6050  
 F: + 86 21 6916 6025  
 E: jianyuan.zhang@sandvik.com  
 W: www.sandvik.com  
 Continuous open pit mining systems, including bucket wheel excavators, belt wagons, spreaders, transport Crawlers.

## SCANTECH INTERNATIONAL

PO Box 1485  
 Springwood  
 Queensland 4127  
 Australia  
**Contact:** Mr Henry Kurth  
 T: + 61 7 3710 8406  
 F: + 61 7 3710 8499  
 E: sales@scantech.com.au  
 W: www.scantech.com.au  
 World leader in process control solutions for conveyed bulk materials. On-belt analysers with proven technologies. Reliable, accurate and dependable ash, moisture and elemental measurement minute by minute. Control quality through blending or monitor specification compliance. Over 1,000 installations.

## SCHADE LAGERTECHNIK GmbH (AUMUND GROUP)

  
 Bruchstraße 1  
 Gelsenkirchen, D-45883  
 Germany  
**Contact:** Dr Christoph Seifert  
**Job Title:** Managing Director  
 T: + 49 209 50 31 60  
 F: + 49 209 50 31 62 88  
 E: sales@schade-lagertechnik.com  
 W: www.schade-lagertechnik.com  
 Engineering, manufacture and supply of Stockyards and Blending Beds of circular and longitudinal shape with Stackers and Tripper cars, Bridge-type Scraper Reclaimers, Portal and Semi-portal Scraper Reclaimers, Cantilever Scraper Reclaimers as well as Wagon Unloading Systems. Services also include field assembly, site supervision, commissioning, after sales service, refurbishment and upgrading of existing equipment.

## SCHENCK PROCESS

c/o Stock Equipment Company, Inc.  
 16490 Chillicothe Road  
 Chagrin Falls  
 Ohio  
 44023  
 USA  
**Contact:** Ms Laura Hanley  
**Job Title:** Marketing  
 T: + 1 440 543 6000  
 F: + 1 440 543 5944  
 E: stock.sales@stockequipment.com  
 W: www.stockequipment.com  
 Other equipment: High capacity hopper and belt feeder reclaim. Stock Equipment and the Schenck Process Group are global specialists in the weighing, screening, feeding and conveying of bulk materials. Systems include railcar unloading, stockpile stackers, plant transfer and high capacity volumetric and gravimetric reclaiming and feeding systems

## SCHENCK PROCESS UK LIMITED

Alpha Court  
 Capitol Park  
 Thorne  
 Doncaster  
 South Yorkshire  
 DN8 5TZ  
 UK  
**Contact:** Mr Richard Sims  
**Job Title:** Technical Sales  
 Director  
 T: + 44 1302 321 313  
 F: + 44 1302 554 400  
 E: enquiries@schenckprocess.co.uk  
 W: www.schenckprocess.co.uk  
 Schenck Process is an expert in the weighing, conveying and handling of coal. Using a range of equipment including train loading and unloading systems, mechanical conveyors and weighing technologies the movement of the material can be accurately monitored and recorded.

## SCHRAGE ROHRKETTENSYSTEM GmbH CONVEYING SYSTEMS

Im Gewerbeta 26-30  
 Friedeburg  
 26446  
 Germany  
**Contact:** Ms Birgit Broer  
**Job Title:** Marketing  
 T: +49 4465 9469 18  
 F: +49 4465 9469 33  
 E: b.broer@schrage.de  
 W: http://www.schrage.de/

## SCORPIO ENGINEERING PVT. LTD

Scorpio House  
 132 Wheeler Road  
 Cox Town  
 Bangalore  
 560 005  
 India  
**Contact:** Mr Jacob P.  
**Job Title:** VP - Marketing &  
 Application  
 T: + 91 99801 625 39/+ 91 77026 3779  
 F: + 91 80 2548119  
 E: jacob@scorpioengg.com, jacobsebmh@gmail.com  
 W: www.scorpioengg.com  
 In addition: fly ash conveying, liner container filling & discharging equipment. The company is a 25-year-old manufacturing organisation in the areas listed and the capacities of the equipment are custom specified and built. The average range is from 100 tph to 1000 tph.

## SEABULK INC

Suite 150  
 1271 Shellbridge Way  
 Richmond  
 British Columbia  
 V6X 2W8  
 Canada  
**Contact:** Mr Sidney Sridhar  
**Job Title:** President  
 T: + 1 604 273 1378 Ext 103  
 F: + 1 604 273 1358  
 E: sbs@seabulk.com  
 W: www.seabulk.com  
 Involved in 'design and build' projects in the marine bulk transportation industry. Ports, self unloaders and transhipper developed by Seabulk have improved bulk transportation logistics significantly.

## SELPECO RESOURCES INC.

14150 NE 20th Street  
 F1, PMB342  
 Bellevue  
 WA  
 98007  
 USA  
**Contact:** Mr S E (Steve)  
 Laccinole  
**Job Title:** Principal  
 Engineer/COO  
 T: + 1 206 255 0885  
 F: + 1 206 260 1474  
 E: selpeco@selpeco.com  
 W: www.selpeco.com  
 Selpeco is a project, program and construction management company for all types of bulk material handling projects. The company has particular expertise in the development of bulk material handling marine terminals, cost analysis, project plans and creating teams of companies to design and build turnkey material handling facilities.

## SEMPERTRANS

Modecenterstrasse 22  
 10 rue des charretiers  
 Vienna  
 1030  
 Austria  
 T: + 43 1 797770  
 E: sempertrans@semperitgroup.com  
 W: www.sempetrans.com  
 SEMPERTRANS has been developing, manufacturing and installing conveyor belts for more than 50 years. Its knowhow, its experience and the quality of its products make SEMPERTRANS one of the world's leading companies in its field.

## SENNEBOGEN MASCHINENFABRIK GmbH

Hebbelstrasse 30  
 Straubing  
 D-94315  
 Germany  
**Contact:** Mr Alfred Endl  
 T: + 49 9421 540148

F: +49 9421 84382  
E: marketing@sennbogen.de  
W: www.sennbogen.com  
Sennbogen offers a wide range of all kinds of materials handling machines, HD rope excavators/cranes, crawler cranes, telescopic cranes and base carriers.

## SENSOR TECHNOLOGY

Apollo Park  
Ironstone Lane  
Wroton  
Banbury  
Oxon OX15 6AY  
UK  
Contact: Mr Mark Ingham  
Job Title: Sales Manager  
T: +44 1869 238 400  
F: +44 1869 238 401  
E: info@sensors.co.uk  
W: www.sensors.co.uk  
Manufacturers of TORQSENSE and LOADSENSE Sensors and Transducers. The TorqSense and LoadSense range of sensors offer accurate, affordable, market leading products across the whole range of industrial applications.

## SERAM

817 boulevard Marius Berliet  
Perpignan  
66000  
France  
Contact: Mr Joaquin Semis  
Job Title: CEO  
T: +33 4 68 61 02 28  
F: +33 4 68 61 57 00  
E: semis.j@seram.net  
W: www.seram.net  
Company has specialized in cargo handling since 1973. Its premium product is the hydraulic equilibrium crane, for which we had the exclusive patent.

## SESCOTRANS FOR DEVELOPED LOGISTICS (SAE)

1, Elshahied Sayed Zakarya St.  
(Behind Sheraton Airport)  
Cairo 11361  
Egypt  
Contact: Mr Kareem Abd El Latif  
Job Title: Assistant General Manager  
T: +2 057 229 00 95  
F: +2 057 229 08 49  
E: kareem.abdelatif@sescotrans.net  
W: www.sescotrans.com  
SESCOTRANS has 50 years of experience in integrated logistics solutions for your business - serving main Egyptian main ports including transportation, customs clearance, warehousing, loading and discharging of different cargo and vessel sizes supported with full setup of facilities and fully-employed resources

## SEW-EURODRIVE GmbH & Co KG

P O Box 3023  
Bruchsal  
D-76652  
Germany  
Contact: Mr Manfred Müller  
T: +49 7251 75 0  
F: +49 7251 75 1970  
E: sew@sew-eurodrive.de  
W: www.sew-eurodrive.com  
Complete drive packages: Helical gear units, Bevel-helical gear units, motors, couplings, swing bases, brakes, geared motors. Planetary gear units, frequency inverters Torque range: 100 ... 1 Mio Nm.

## SGS (NEDERLAND) BV

Malledijk 18  
Spijkensse  
AE 3200  
The Netherlands  
Contact: Mr Rolf Witting  
T: +31 181 69 3260  
F: +31 181 69 3581  
E: rolf.witting@sgs.com  
W: www.sgs.nl

## SGS AUSTRALIA PTY

Unit 16  
33 Maddox Street  
Alexandria  
NSW 2015  
Australia  
Contact: Mr Stephen Hemsworth  
Job Title: National Business Manager  
T: +61 2 8594 0400  
F: +61 2 8594 0419  
E: stephen.hemsworth@sgs.com  
W: www.au.sgs.com  
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.

## SGS MINERALS

1 Place Des Alps  
PO Box 2152  
Geneva CH 1211  
Switzerland  
Contact: Mr Richard Lihou  
T: +41 22 739 9111  
F: +41 22 739 9815  
E: richard.lihou@sgs.com  
W: www.sgs.com  
The SGS Group is the global leader and innovator in verification, inspection, testing and certification services. Founded in 1878, SGS is recognised as the global benchmark for the highest standards of expertise and integrity. With over 30,000 employees, the Company operates a network of offices and laboratories in over 140 countries around the world.

## SGS MINERALS

185 Concession Street  
PO Box 4300  
Lakefield, ON K0L 2H0  
Canada  
Contact: Ms Peggy Bell  
Job Title: Global Minerals Marketing Coordinator  
T: +1 705 652 2000  
F: +1 705 652 6365  
E: minerals@sgs.com  
W: www.sgs.com/coal  
Knowing your coal quality and representatively sampling are essential to eliminate penalties and maximize profits. SGS' technical expertise provides unrivalled experience and value throughout the coal value chain to eliminate operation risk.

## SHANGHAI GLOBAL MACHINERY CO., LTD (SGMC)

No.1449 Baishi Road  
Qingpu District  
Shanghai 201711  
China  
Contact: Mr Huang  
T: +86 2139 821 126  
W: www.sgmcgrab.com

## SHANGHAI GUAN HAI ENGINEERING CO.,LTD

Lane3736-5, Hunan Highway  
Pudong  
Shanghai 201318  
China  
Contact: Ms Maggie Xu  
Job Title: Sales Department  
T: +86 21 2098 0848 807  
F: +86 21 2098 0849  
E: maggie@ghengineer.com  
W: www.ghengineer.com

## SHANGHAI GUANBO MACHINERY EQUIPMENT CO.,LTD

3736-5 Hunan Road  
Pudong  
Shanghai  
China  
Contact: Ms Alica Fang  
Job Title: Marketing  
T: +86 21 5088 0140

E: sales@gbm-china.com  
W: www.gbm-grab.com

## SHANGHAI JANUS GRAB CO., LTD.

Room 518-519  
VMO 37#  
2049 Pujin Road  
Shanghai  
Shanghai 201114  
China  
Contact: Mr Fred Hu  
Job Title: Deputy General Manager  
T: +86 21 6885 5558  
F: +86 21 6885 5559  
E: janus@janusgrab.com  
W: http://www.janusgrab.com/  
A leading and innovative grab specialist in China and Asia market, design and manufacture various kinds of grabs for more than 20 years. We are the best link between ship and shore!

## SHANGHAI PEINER SMAG MACHINERY CO.,LTD

6098 Huqingping Road, Zhujiajiao  
Qingpu  
Shanghai 201713  
China  
Contact: Mr Ellan Chan  
Job Title: General Manager  
T: +86 21 5924 7798  
F: +86 21 5924 0057  
E: info@shepinner.com  
W: www.shepinner.com

## SHANGHAI QIFAN CO.

25F, Baoding Mansion  
Xujiahui Road  
Shanghai  
200025  
China  
Contact: Mr Eric Liu  
T: +86 21 51029257  
F: +86 21 51062358  
E: erichshpy@163.com  
W: http://www.qifanco.com/

## SHANGHAI YO-PI PORT MACHINERY CO. LTD

Room 603, No 3 Lane 298  
East Wenhui Road  
Shanghai  
PR  
China  
Contact: Miss Avril  
T: +86 21 552 28716  
F: +86 21 5522 8739  
E: grab@shyp-pm.com  
W: www.shyp-pm.com/

## SHANGHAI ZHENHUA PORT MACHINERY CO (ZPMC) LTD

3470 Pudong Nan Lu  
Shanghai  
PR  
200125  
China  
Contact: Mr Haiqing Gu  
Job Title: Project Management Department  
T: +86 21 5839 6666 (20364)  
F: +86 21 5839 9555  
W: www.zpmc.com  
World-famous manufacturer of cranes and large steel structures. Products include quayside container cranes, gantry cranes, shiploader/unloaders, bucketwheel stackers and reclaimers, portal and floating cranes, engineering vessels and big steel bridge structures etc.

## SHANTHI INTERNATIONAL

21, Center Point  
Indira Gandhi Road  
Gujnagar  
Jajarat  
361008  
India  
Contact: Mr Sanjay Masuria  
Job Title: Director - Marketing - International

T: +91 288 255 6671 / +91 288 2555 867  
F: +91 288 255 4254  
E: sanjay@servoday.in  
W: www.servodaygrabs.com  
Our manufacturing range of Four Rope Mechanical Grabs, Orange Peel Grabs, Radio Remote Control Grabs includes the capacity from 6.0CBM to 52.0CBM and is suitable to handle many types of bulk materials. Please visit our website  
www.servodaygrabs.com for further information about our company and products.

## SHAW ALMEX CANADA

PO Box 430  
Parry Sound  
Ontario P2A 2X4  
Canada  
Contact: Ms Pamela McGeorge  
Job Title: Sales Manager  
T: +1 705 746 5884 / +1 9053317177  
F: +1 705 746 9484  
E: sales@almex.com  
W: www.almex.com

## SHI.E.L.D. SERVICES SRL



Viale Monza 270  
Milan 20128  
Italy  
Contact: Mr Corrado Cuccurullo  
Job Title: Chief Executive Officer  
T: +39 02 83623450  
F: +39 02 83623451  
E: info@shieldservices.it  
W: www.shieldservices.it  
Shi.E.L.D. Services srl provides management and consultancy services for the shipping and industry markets and for the on-shore and off-shore logistics of dry bulk materials, including design, maintenance, management and operation of ships and transshippers and cargo handling equipment.

## SIBRE - SIEGERLAND BREMSEN GMBH

Auf der Stücke 1-5  
Haiger  
Hessen  
D-35708  
Germany  
Contact: Ms Tabitha Kuhn  
T: +49 2774 911 3411 (direct)  
E: tabitha.kuhn@sibre.de  
W: www.sibre.de  
SIBRE-Siegerland Bremsen manufactures industrial brakes (drum-, disc-, caliper- and storm brakes) and drive components (e.g. drum couplings) and offer an optimum combination of innovative high quality products, easy usage and minimized life-cycle costs, by employing latest manufacturing and quality assurance technologies.

## SIDERAR / TERNIUM

Centro de Informacion  
Ave. Cordoba 320, Piso 4  
Ciudad Autonoma de Buenos Aires  
Buenos Aires  
C1054AAP  
Argentina  
Contact: Mr Ariel Fabré  
Job Title: Engineer  
T: +54 11 4018 6538  
F: +54 11 4018 1005  
E: BAIAFA@techint.net  
W: www.siderar.com  
Engineering Manufacturer Steel Plants, group of companies.

## SIEBTECHNIK GmbH

Platanenallee 46  
Mülheim an der Ruhr D-45478  
Germany  
Contact: Mr G Liefke  
T: +49 208 580 100  
F: +49 208 580 1300  
E: sales@siebtechnik.com  
W: www.siebtechnik.com  
Wormscreen, pusher-type and vibratory centrifuges, centrifuges for granular products; decanters for continuous separation of solids from liquids; laboratory centrifugal, size-reduction machines, especially vibratory mills for grinding to ultimate fineness, machines and plants for taking and preparing samples.  
Horizontal, elliptical and circular motion screening machines, jigs.

## SIEMENS AG INTERNATIONAL

Frauenauracherstrasse 80  
Erlangen  
91056  
Germany  
Contact: Mr Hans Hertogh  
Job Title: Marketing Manager  
T: +49 9 131 984 299  
E: cranes.ih@siemens.com  
W: www.siemens.com/cranes

## SIEMENS NEDERLAND NV

PO Box 16068  
The Hague  
2500 BB  
The Netherlands  
Contact: Mr Hans Hertogh  
T: +31 70 33 33 333  
F: +31 70 33 33 534  
E: hans.hertogh@siemens.com  
W: www.siemens.com

## SIG SOCIETÀ ITALIANA GOMMA SPA

Via Colombo 144  
Gorta Minore  
Varese  
21055  
Italy  
Contact: Mr Gerardo Frizzati  
T: +39 0331 365135  
F: +39 0331 365215  
E: sig@sig.it  
W: www.sig.it

## SIMPLICITY PROJECTS PVT LTD

17 Community Centre  
Maya Puri, Phase 1  
New Delhi 110064  
India  
Contact: Mr R K Makhija  
Job Title: President  
T: +91 11 2811 5093  
F: +91 11 2811 6744  
E: sppl@simplicityprojects.com  
W: www.simplicityprojects.com

## SIWERTELL AB

PO Box 566  
Gunnarstorp  
Bjuv SE-267 25  
Sweden  
Contact: Mr Juha Huovilainen  
Job Title: Sales Director, Bulk Handling  
T: +46 42 85800  
F: +46 42 85899  
E: blksales@siwertell.com  
W: www.siwertell.com  
For dry bulk handling, Cargotec offers high-capacity, efficient and environment-friendly systems under their brand name Siwertell. Products include ship loaders, ship unloaders, bulk terminal systems, horizontal and vertical screw conveyors and storage systems. Deliveries are uniquely tailor-made to suit each customer's specific requirements.

## SLY INCORPORATED

8300 Dow Circle  
Suite 600  
Strongsville

OH 44136  
USA  
Contact: Mr Bill Kurz  
Job Title: Vice President/Regional Sales Manager  
T: +1 440-274-0390  
F: +1 440 891 3210  
E: sales@slvinc.com  
W: www.slvinc.com  
Designs and manufactures industrial air pollution control equipment, including baghouse dust collectors, cartridges collectors, wet scrubbers (plate, venturi and eductor) and retractable loading spouts. The company manufacturing facility fabricates in carbon steel, stainless and duplex steels. Production also includes cages.

## SMB INTERNATIONAL GmbH

Friedrich List Str 3-7  
Quickborn 25451  
Germany  
Contact: Mr Andreas Heckel  
Job Title: Managing Director  
T: +49 41 06 12388 0  
F: +49 41 06 12388 19  
E: info@smb-group.de  
W: www.smb-shiploading.com  
SMB meets the demanding material-related requirements of conveying bulk and bagged goods. The company designs and manufactures high-performance conveying solutions designed for trouble-free long-term operation. Projects all over the world convince fertilizer producers, port operators and industrial specialists of the quality of German engineering.

## SMILEY MONROE LTD

23 Ferguson Drive  
Knockmore Hill Industrial Park  
Lisburn, Co. Antrim  
Northern Ireland BT28 2EX  
UK  
Contact: Mr Tim Monroe  
Job Title: Marketing Manager  
T: +44 28 9267 3777  
F: +44 28 9266 3666  
E: sales@smileymonroe.com  
W: www.smileymonroe.com  
Exporting worldwide - experts in the design, manufacture and service of conveyor belts, screening media and conveyor spillage control & dust encapsulation systems for bulk materials handling. Industries served range from quarrying, mining and cement plants to ports, steelworks and power stations.

## SMM - SOCIEDADE DE MONTAGENS

METALOMECANICAS  
Quinta da Fonte  
Edificio D.João I, nº 4 - r/c B  
Paço de Arcos 2770-203  
Portugal  
Contact: Mr Mário Rio Carvalho  
Job Title: Business Development Manager  
T: +351 21 4697600 / 607  
F: +351 21 4697612  
E: mario.carvalho@smm.com.pt  
W: www.smm.com.pt  
SMM scope of work comprises among others the assembly and mechanical/electrical erection contracts in the following areas: Thermal Power and co-generation Plants; Hydro-power Plants; Industrial Piping; Hydrocarbon Storage Facilities and Terminals, Maintenance Contracts and Industrial Plants Shutdown works; Maintenance and revamping of lifting and handling equipment.

## SOLITEC ENGINEERING

Unit 8  
Gilchrist Thomas Industrial Estate  
Blaenavon  
Gwent NP4 9RL  
UK  
Contact: Mr David Woodland  
Job Title: General Manager  
T: +44 1495 790623  
F: +44 1495 790666  
E: sales@solitec.co.uk

**W:** www.solitec.co.uk  
Design and manufacture bulk materials handling equipment to food, pharmaceutical, cement, petrochemical and other industries. Product range, typically, consists of screw conveyors, bucket elevators, mixers (various), IBC systems and silo discharge aids. Part of the ROTOLOK Group of companies.

## SOTECMA INC

245, boul. Yvon - L'Heureux Nord  
Beloil  
Quebec  
J3G 5R8  
Canada  
**Contact:** Ms Isabelle Coutu  
**Job Title:** Administrative Assistant  
**T:** + 1 450 464 4426  
**F:** + 1 450 464 4534  
**E:** info@sotecma.com  
**W:** www.sotecma.com  
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](http://www.sotecma.com).

## STAG AG

Industriestrasse 11  
Maienfeld  
7304  
Switzerland  
**Contact:** Mr Martin Adam  
**Job Title:** Sales/Marketing  
**T:** + 41 81 3035841 / 5800  
**F:** + 41 81 3035899  
**E:** office@stag.net  
**W:** www.stag.net  
STAG bulk material technology for mechanical and pneumatic conveying technology as well as enilage technology. We are also the ideal partner as a general company for complex assignments for nearly all bulk materials in plant construction.

## STEMM EQUIPOS INDUSTRIALES, S.L.



Poligono Ibarluz  
Pabellón B-9  
Hernani  
Gipuzkoa  
20120  
Spain  
**Contact:** Mr Martin Amesti  
**Job Title:** General Manager  
**T:** + 34 943 335 033  
**F:** + 34 943 333 506  
**E:** info@stemm.com  
**W:** www.stemm.com  
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 single-rope radio-controlled clamshell grabs with state-of-the-art construction and service concepts. STEMM is your partner for consulting, manufacturing and servicing around the grab world. For further information, kindly check our website [www.stemm.com](http://www.stemm.com).

## STEWART INSPECTION AND ANALYSIS (PTY) LTD

PO Box 267  
Brakpan  
1541  
South Africa  
**Contact:** Mrs Carol Le Cordeur  
**T:** + 27 11 740 0621  
**F:** + 27 11 740 0626  
**E:** carol.lecordeur@aisgroup.com  
**W:** www.stewartgroupglobal.com

## STM SRL

Zona Industriale snc  
Tito Scalco  
Potenza  
85050  
Italy  
**Contact:** Mr Anselmo Zirpoli  
**Job Title:** Sales Manager  
**T:** + 39 0971 485073 ext 601  
**F:** + 39 0971 485086  
**E:** anselmo.zirpoli@stmpotenza.com  
**W:** www.stmpotenza.com  
STM is specialized in the engineering and supply of belt cover systems for bulk materials handling facilities. Since 1975 we provide worldwide innovative integrated solutions in order to increase efficiency, reliability and cost savings for the customers' production processes.

## STOKMAN BV

Brasem 18  
Raamsdonksveer  
AB 4941 SE  
The Netherlands  
**Contact:** Mr Mark Hoekstra  
**Job Title:** Account Manager  
**T:** + 31 162 516040  
**F:** + 31 162 517590  
**E:** mhokstra@stokmanbv  
**W:** www.stokmanbv.com

## STRUDES INC

1440 Sainte Catherine St  
Suite 905  
Montreal  
Quebec  
Canada  
**Contact:** Mr Henry Nowodworski  
**Job Title:** President  
**T:** + 1 514 731 6951 x 123  
**F:** + 1 514 737 4146  
**E:** h.nowodworski@strudes.ca  
**W:** www.strudes.ca  
Strudes Inc. is an engineering consulting company, founded in Montreal in 1984. We specialize in design for heavy industry. We provide full range of engineering services including preliminary and final design, contract evaluation and administration, environmental studies, schedule development, etc.

## STUDIO TECNICO MALNATI SAS

Via G. Treccani/Alfieri 22  
Milano  
I-20141  
Italy  
**Contact:** Dr Andrea Malnati  
**Job Title:** Product Manager  
**T:** + 39 02 895 017 30  
**E:** andrea.malnati@stmalnati.com  
**W:** www.stmalnati.com  
Our company represents several industrial manufacturers. We develop basic engineering for solid material handling systems. Our team is focused on selecting machineries and designing plants for:  
- crushing - screening  
- handling systems  
- rollers and rubber belt  
- e-motors and inverters  
- process automation  
Other Equipment: Telescopic Cascade Chutes

## SUCOFINDO

Laboratory Strategic Business Unit  
Graha Sucofindo 6th Floor  
Jalan Raya Pasar Minggu Kav.34  
Jakarta 12780  
Indonesia  
**Contact:** Mr Diding Sudira  
**Job Title:** Senior Manager  
**T:** + 62 21 798 3666  
**F:** + 62 21 798 6878  
**E:** diding@sucofindo.co.id  
**W:** www.sucofindo.co.id

## SUMITOMO HEAVY INDUSTRIES MATERIAL HANDLING SYSTEMS Co., Ltd.

5th Floor Sumitomo Fudosan  
Hibiya Building  
8-6, Nishishimbashi 2-Chome  
Minato-Ku  
Tokyo  
105-0003  
Japan  
**Contact:** Mr Akihide Ito  
**Job Title:** General Manager,  
International Sales  
**T:** + 81 3 6891 2164 / + 81 3 6737 2643  
**F:** + 81 3 6866 5181  
**E:** Akh\_Itou@shi.co.jp  
**W:** www.shi.co.jp/shi-mh/  
SES has produced a very wide range of materials handling equipment for many years and perseveres in its efforts to improve the efficiency of their leading continuous ship unloading range of machines.

## SUPERIOR INDUSTRIES, Inc.

315 East State Highway 28  
PO Box 684  
Morris  
Minnesota  
56267  
USA  
**Contact:** Mr Corey Poppe  
**Job Title:** Communications Manager  
**T:** + 1 320 589 2406  
**F:** + 1 320 585 5644  
**E:** info@superior-ind.com  
**W:** www.superior-ind.com  
Superior Industries is the only North American based company to manufacture a complete line of conveying equipment like telescoping rail stackers, mobile shiploaders, truck unloaders and fixed conveyor systems; plus conveyor related components like idlers, pulleys, scrapers and other accessories.

## SVENDBORG BRAKES USA, LLC

4155 E. Jewell Ave., Suite 1018  
Denver  
CO  
80222  
USA  
**Contact:** Mr David Brooksbank  
**Job Title:** Marketing Director (Head Office)  
**T:** + 1 303 285 1271  
**E:** david.brooksbank@altramotion.com

## SWIRE CTM BULK LOGISTICS

C Transport Maritime SAM  
Gildo Pastor Centre  
7 Rue du Gabian  
Monaco  
MC 98000  
Monaco  
**Contact:** Captain Giorgio Vallega  
**Job Title:** Operation/Commercial Manager  
**T:** + 377 9798 5981  
**F:** + 377 9798 2306  
**E:** gvallega@ctmcc.com  
**W:** www.swirectmbl.com  
Sums up the experience, know-how and networks of its parent companies in the dry bulk and logistics field, providing a full range of integrated services from the supplier to the end users, including specialised barge services, transshipment, river, coastal and ocean transportation by means of conventional bulkcarriers or self-unloading vessels and barge.

## SYNERGY ENGINEERING LTD

135 Glacier Street  
Coquitlam  
BC  
V3K 5Z1  
Canada

**Contact:** Mr Richard W. Neuman  
**Job Title:** President  
**T:** + 1 604 472 2800  
**F:** + 1 604 464 9399  
**E:** office@synergy-eng.com  
**W:** http://www.synergy-eng.com

## TAIM WESER GMBH



Koenigstrasse 45  
Bad Oeynhausen  
32547  
Germany  
**Contact:** Mr Frank Herrmann  
**Job Title:** Sales Manager - Bulk Materials Handling  
**T:** + 49 5731 1508 12  
**F:** + 49 5731 1508 13  
**E:** frank.herrmann@taimweser.com  
**W:** www.taimweser.com  
A company with installations in 59 countries and more than 100 years of experience. We are specialists in the design, fabrication and supply of complete "turn key" installations for the handling of bulk materials on a worldwide basis and within the major industrial sectors.

## TAKRAF GmbH

Torgauer Str. 336  
Leipzig  
D-04347  
Germany  
**Contact:** Mr Thomas Eckel  
**Job Title:** Director Sales  
**T:** + 49 341 2423 605  
**F:** + 49 341 2423 610  
**E:** takraf.sales@tenova.com  
**W:** www.takraf.com  
With more than a century of experience and tradition in the field of open cast mining, bulk materials handling, and port facilities, the company is proud of its worldwide standing. Services offered: planning, design, fabrication, erection and after sales service of machines, systems and complete plants.

## TBA DONCASTER

4 Railway Court  
Ten Pound Walk  
Doncaster  
South Yorkshire DN4 5FB  
UK  
**Contact:** Mr David Trueman  
**Job Title:** Sales Director  
**T:** + 44 1302 330 837  
**F:** + 44 1302 724 731  
**E:** david.trueman@dbis.biz  
**W:** www.tba.group  
DBIS provides real time terminal management systems to over 25 terminals around the world.

## TECHNAERO APS

Blaabaervej 3  
Haslev  
DK-4690  
Denmark  
**Contact:** Mr Anders Larsen  
**Job Title:** CEO  
**T:** + 45 56314925  
**F:** + 45 56314555  
**E:** sales@techNaero.dk  
**W:** www.techNaero.dk  
Other equipment: Silo systems

## TELESTACK LIMITED



Bankmore Way East  
Omagh  
County Tyrone  
BT79 0NZ  
Northern Ireland  
**T:** + 44 28 82 25 11 00  
**F:** + 44 28 82 25 22 11  
**E:** sales@telestack.com  
**W:** www.telestack.com  
Specialist manufacturers of mobile bulk material handling systems for the Ports/Inland terminals, Mines, Quarries,

Steel Mills, Cement Plants and Powerstation industries globally. The mobile range of equipment offers unrivalled flexibility for the operator, reducing costs in Cap-Ex. Investment compared to fixed installations, fuel and labour. Equipment includes: mobile shiploaders/unloaders, mobile stackers, mobile truck unloaders, mobile reclaim hoppers, mobile rail wagon loaders/unloaders and mobile link conveyors. We have supplied and support some of the world largest blue chip companies.

## TEMA BV

PO Box 3220  
Rijswijk  
GE  
2280  
The Netherlands  
**Contact:** Mr M P van Delden  
**T:** + 31 70 390 6555  
**F:** + 31 70 399 3390  
**E:** mp.vandelden@tema.nl  
**W:** www.tema.nl  
TEMA / SIEBTECHNIK Centrifuges  
Coal centrifuges for coarse and fine coal; Sample taking, sample preparation, complete sampling plants and laboratory equipment; Linear- and circular-motion screening machines.

## TEMA SYSTEMS INC.

7806 Redsky Drive  
Cincinnati  
Ohio  
45249  
USA  
**Contact:** Mr Mike Mullins  
**T:** + 1 513 489 7811  
**F:** + 1 513 489 4817  
**E:** sales@tema.net  
**W:** www.tema.net  
Other equipment: Centrifuges/dryers. Manufacture and supply cross-belt sampling systems (up to 3M wide primary cutter) in accordance with ISO standards, screening machines and centrifuges for the coal and other mineral industries. Please visit our web page for additional information.

## TENOVA S.p.A - TENOVA TAKRAF ITALY

Via Albareto, 31  
Genova  
16153  
Italy  
**Contact:** Mr Pietro Bibolini  
**Job Title:** Commercial Director  
**T:** + 39 010 605 4634  
**F:** + 39 010 605 4710  
**E:** pietro.bibolini@itenovagroup.com  
**W:** www.tenovagroup.com  
Provides a full range of high capacity bulk materials handling equipment for coal and other minerals and ores. Its range of CSUs and shiploaders are amongst the largest capacity machines operating worldwide.

## TEREX DEUTSCHLAND GmbH

Industriest. 3  
Bad Schönborn  
76669  
Germany  
**Contact:** Mr Dominik Vierkotten  
**Job Title:** Managing Director  
**T:** + 49 725 384 0  
**W:** www.terex-fuchs.de  
Loading machines from 19 to 77.5t operating weight and up to 21m reach. Complete solutions honed for your specific purpose.

## TEUFELBERGER SEIL GES.M.B.H

Böhmerwaldstraße 20  
Wels 4600  
Austria  
**T:** + 43 7242 615 0  
**F:** + 43 7242 605 01

**E:** wirerope@teufelberger.com  
**W:** www.teufelberger.com  
TEUFELBERGER is a globally successful enterprise specialized in manufacturing high performance wire ropes for various crane applications such as bulk handling for more than 225 years. TEUFELBERGER operates six manufacturing sites worldwide and possess a close-knit network of distribution partners worldwide.

## THE CHINA NAVIGATION Co. PTE. LTD

300 Beach road #27-01  
The Concourse  
Singapore  
199555  
Singapore  
**Contact:** Mr Richard Sell  
**Job Title:** Commercial Manager  
**T:** + 65 6603 9429  
**E:** Richard.Sell@chinanav.com  
**W:** www.chinanav.com

## THE GRAB SPECIALIST B.V.

Draaibrugweg 1  
Almere  
1332AA  
The Netherlands  
**Contact:** Mr Emiel Bleyenbergh  
**Job Title:** Director  
**T:** + 31 365 32 88 22  
**F:** + 31 365 49 99 22  
**E:** info@tgs-grabs.nl  
**W:** www.tgs-grabs.nl  
We supply all types of bulk handling grabs like clamshells in single line/remote control/electro-hydraulic/2-line and 4-line. Grabs can be supplied in standard design or to clients specification. We stand for good advice, quality, short delivery times and good service.

## THE RARING CORPORATION

12007 NE 95th St  
Vancouver  
WA  
98682  
USA  
**Contact:** Mr Gonzalo Campos  
**Job Title:** President  
**T:** + 1 360 892 1659  
**F:** + 1 360 892 1624  
**E:** gcampos@raringcorp.com  
**W:** www.raringcorp.com  
We design and manufacture ADSTM Dust Suppression Systems. Our systems are able to work under the most demanding weather conditions. ADSTM DSS helps to take care of the environment, reduce the losses of processed material, maintain safely working environments and free of accumulation of material and most importantly to reduce the risks of workers getting silicosis.

## THERMO FISHER SCIENTIFIC

501 - 90th Avenue NW  
Minneapolis  
MN  
55433  
USA  
**Contact:** Ms Paula Frisk  
**Job Title:** Product Manager/Marketing  
**T:** + 1 800 445 3503  
**F:** + 1 763 783 2525  
**E:** Sales.bulk.us@thermofisher.com  
**W:** www.thermofisher.com/  
bulkweighing  
Thermo Scientific branded products are a specialty line of industrial in-motion weighing, inspection, monitoring and control equipment. These products, formerly branded as Ramsey, are used for process control, production monitoring and automation in the coal and minerals mining, cement, construction and aggregates industries, among others.



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**THIELE GmbH & Co KG**

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Iserlohn  
D- 58640  
Germany  
**Contact:** Mr Norbert Hinkelmann  
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**T:** + 49 2371 947 0  
**F:** + 49 2371 947 295  
**E:** bulkmateral@thiele.de  
**W:** www.thiele.de  
More than 80 years experience in the engineering and manufacturing of conveyor chain systems such as round steel chains, bushed conveyor chains, forged conveyor chains and cardan chains, including all attachments.

**THYSSENKRUPP INDUSTRIAL SOLUTIONS (CANADA) Inc.**

1177-11th Avenue SW  
Suite 500  
Calgary  
Alberta  
T2R 1K9  
Canada  
**Contact:** Mr Steve Harrington  
**Job Title:** Vice President Marketing  
**T:** + 1 403 209 4431  
**F:** + 1 403 245 5625  
**E:** info.kis.canada@thysenkrupp.com  
**W:** www.krupp.ca  
Involved for many years in the design and supply of turnkey, environmentally sensitive mining and material handling projects. Product range: conveying systems; crushing systems; stackers; ship loaders and ship unloaders; storage and reclamation design and supply.

**THYSSENKRUPP INDUSTRIAL SOLUTIONS (USA), Inc.**

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Suite #404  
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Colorado  
80111-5820  
USA  
**Contact:** Mr Bill Halley  
**Job Title:** Mechanical Engineer  
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**F:** + 1 303 770 4522  
**E:** bill.halley@thysenkrupp.com  
**W:** www.thysenkrupp-industrial-solutions.com  
Design and supply turnkey, environmentally sensitive mining and material handling projects. Product range includes: conveying systems; crushing systems; stackers; ship loaders and ship unloaders; storage and reclamation design and supply.

**THYSSENKRUPP INDUSTRIAL SOLUTIONS AG**

Mining Technologies -OU  
Materials Handling Germany  
Ernst-Heckel-Strasse 1  
St Ingbert-Rohrbach  
Saarland  
D-66386  
Germany  
**T:** + 49 6894 599 0  
**F:** + 49 6894 599 468  
**E:** Info-mh@thysenkrupp.com  
**W:** www.thysenkrupp-industrial-solutions.com  
Beside individual items listed, the company designs and

supplies complete material handling plants turnkey to thermal power plants, the fertilizer industry (for handling of urea, phosphates etc), the cement and mining industry as well as complete port handling solutions.

**THYSSENKRUPP INDUSTRIAL SOLUTIONS SOUTH AFRICA - RESOURCE TECHNOLOGIES**

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Johannesburg  
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2191  
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**W:** www.thysenkrupp-materialshandling.co.za  
www.thysenkrupp-industrial-solutions.co.za  
We offer a comprehensive product portfolio and a close-meshed sales and service network for our customers in the sectors of mining, cement, mineral processing and bulk materials handling. Our customers benefit from our decades of experience and our unique know-how in the fields of research and development, engineering, project management and after-sales service.

**TMEIC**

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**E:** don.samsa@tmeic-ge.com  
**W:** www.tmeic.com

**TMSA TECNOLOGIA EM MOVIMENTAÇÃO S/A**

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Pastoriza, 710  
Bairro Sarandi  
Porto Alegre  
RS  
91160-310  
Brazil  
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Garcia  
**Job Title:** Marketing Manager  
**T:** + 55 51 2131 3333  
**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 turnkey, EPCM and Partnership Contract Agreements.

**TOPCON TECHNOLOGY LTD**

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Stroud  
Gloucestershire  
GL6 9BH  
UK  
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**T:** + 44 1453 733300  
**F:** + 44 1453 733322  
**E:** cmattiolo@topcon.com  
**W:** www.rdstec.com  
RDS Technology (Topcon Positioning Group) was formed in 1969 and specialises in the design and manufacture of on-board weighing scales for loaders (LOADMASTER a 100, LOADMASTER a50), excavators (LOADEX 100) and

rigid dump trucks (WEIGHLOG a 10).

**TRAMCO, Inc**

1020 East 19th Street  
Wichita  
KS  
67214  
USA  
**Contact:** Mr Ben Cott  
**Job Title:** Sales Product Manager  
**T:** + 1 316 264 4604  
**F:** + 1 316 264 7965  
**E:** sales@tramcoinc.com  
**W:** www.tramcoinc.com  
Manufactures enclosed belt, drag chain and bucket elevators for industrial markets. The JetBelt conveyor is a belt supported by a cushion of air between the belt and the pan and offers an entirely new level of operating efficiency for dry bulk handling of coal.

**TRANS-GLOBAL SOLUTIONS, Inc.**

5255 N Twin City Hwy  
Nederland  
TX  
77627  
USA  
**Contact:** Mr William Scott  
**Job Title:** Vice President  
**T:** + 1 409 727 4801  
**F:** + 1 409 729 1132  
**E:** wfscott@tsgsgroup.com  
**W:** www.tsgsgroup.com

**TRANSHIP LTD**

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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:** http://transship.ua

**TRF LIMITED (TATA)**

11 Station Road  
Burma Mines  
Jamshepur  
Jharkhand  
831 007  
India  
**Contact:** Mr D.C. Jha  
**Job Title:** Chief Marketing (BMHB)  
**T:** + 91 657 30 46242  
**F:** + 91 657 2345733  
**E:** dcjha@trf.co.in  
**W:** www.trf.co.in / www.tata.com/company/profile/TRF  
Other equipment: Plough feeders, Trippers, Side discharge loaders, Barrel reclaimer, Port crane, Special duty crane, Steep inclined conveyor.  
A TATA Group company providing service to all sectors in bulk material handling & processing system on EPC basis or EP basis.

**TRIODETIC**

10 Didak Drive  
Ampror  
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@triodectic.com  
**W:** www.triodectic.com  
Geodesic Domes and longitudinal covers for dust control and to protect against material loss  
New or existing stockpiles where dust issues are a problem.  
Triodectic Domes can be installed over operation Stockpile without downtime.

**TRIPLE POINT TECHNOLOGY**

301 Riverside Avenue  
Westport  
CT  
06880  
USA

**Contact:** Mr Peter Cooperman  
**Job Title:** Marketing Communications Strategist  
**T:** + 1 203 429 3155  
**F:** + 1 203 291 7977  
**E:** info@tpt.com

**TSUBAKI KABELSCHLEPP GmbH**

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D-57482  
Germany  
**Contact:** Mr Frank Springer  
**T:** + 49 2762 4003 0  
**F:** + 49 2762 4003 220  
**E:** info@kabelschlepp.de  
**W:** www.kabelschlepp.de  
Founded in 1954, KABELSCHLEPP is known today as one of the world leaders where cable carriers, guideway protection and conveyor systems are concerned. Products are today being used by numerous well-known machine builders in Germany and abroad.

**TSUBAKIMOTO BULK SYSTEMS CORPORATION**

Ryokuchieki Building 7F,  
2-4-1, Terauchi,  
Toyonaka  
Toyonaka  
Osaka  
561-0872  
Japan  
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**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 (TRANSPORTATION TECHNOLOGY SYSTEMS) LLC**

60F Darziema Street  
Riga  
LV-1073  
Latvia  
**Contact:** Mr Alex Menschikov  
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**F:** + 371 6713 8365  
**E:** alex.menschikov@tts.lv  
**W:** www.tts.lv  
TTS is Latvian manufacturing company with 25 years of experience in design and production of bulk material handling equipment. Our core products are conveyors of different kind, mobile stackers/shiploaders, link conveyors for vast types of materials, supporting steel structures.

**TTS HUAHAI SHIPS EQUIPMENT**

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**TTS MARINE AS**

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**F:** + 47 55 94 74 01  
**E:** info@tts-marine.no  
**W:** www.ttsgroup.com  
TTS is a global company that develops and supplies equipment for the maritime and

offshore industry, organised in five divisions: Marine Cranes, Drilling Equipment, Dry Cargo Handling, Deck Machinery and Port & Material Handling. TTS has 25 operational units in 12 countries.

**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  
Manufactures air-supported belt conveyors. Low-pressure air is blown in, replacing roller-idlers on the carrying side. The aerconveyor is a bulks solid conveyor and is suitable for a wide range of products. It can be totally enclosed protecting the product from the environment and vice versa.

**VEENSTRA MACHINEFABRIEK B.V.**

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7741KC  
The Netherlands  
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**E:** mach@veenstra-coevorden.nl  
**W:** www.veenstragroup.nl

**VENTYX**

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**E:** contact.center@au.abb.com  
**W:** www.ventyx.com

**VERACHTERT NEDERLAND B.V.**

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**Contact:** Mr Derwin Moerlie  
**Job Title:** Foreign/Export Sales  
**T:** + 31 73 640 41 11  
**E:** info@veraned.nl  
**W:** www.veraned.nl  
Verachttert has developed itself in 60 years into the market leader of Work Tools for all types of excavators and wheel loaders, and offers solutions for the specific wishes of the customer. Verachttert products represent quality and productivity.  
Other equipment: Coal handling buckets & funnel buckets

**VERSTEGEN GRIJPEERS BV**

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**E:** info@verstegen.net  
**W:** www.verstegen.net  
A leading manufacturer, specialising in developing, designing and constructing all kinds and types of grab units. Its product range includes single/two/four rope grabs and hydraulic grabs.

**VIBCO INC**

75 Stilson Road  
Wyoming  
RI  
02898  
USA  
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**W:** www.vibco.com

**VIBRAFLOOR**

Za 27 Rue de la Tuilerie  
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**Job Title:** President  
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**F:** + 33 3 85 44 06 79  
**E:** jc.poncet@vibrafloor.com  
**W:** www.vibrafloor.com  
Vibrafloor supplies the automatic reclaimer VIBRAFLOOR. Independent vibrating modules laid on slight inclines, typically 8 to 12°, remove efficiently most bulk products, free flow or cohesive, out of ship holds, silos, storage platforms, railway cars etc.... No personnel, maintenance free, totally safe, negligible operating cost are major advantages.

**VOLLERT ANLAGENBAU GmbH**

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74189  
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**Contact:** Mr Juergen Schiemer  
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**T:** + 49 7134 52 232  
**F:** + 49 7134 52 222  
**E:** juergen.schiemer@vollert.de  
**W:** www.vollert.com  
Other equipment: Shunting Systems.  
Vollert shunting systems are the ideal solution for rail-bound in-plant loading and shunting operations handling all kinds of materials (bulk cargo, liquids etc) - ranging from stationary shunting systems to free-moving shunting robots with diesel or electric drive.

**VOLVO CONSTRUCTION EQUIPMENT**

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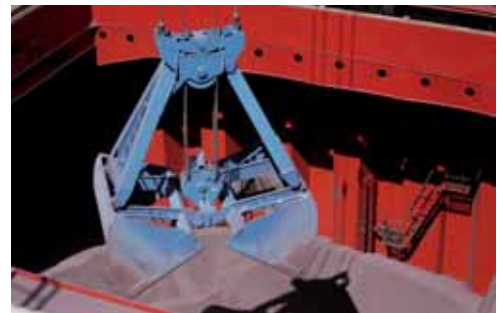
**VORTEX GLOBAL**

1725 Vortex Avenue  
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KS 67401  
USA  
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**T:** +1 785 825 7177  
**E:** ljohnson@vortexglobal.com  
**W:** www.vortexglobal.com  
Vortex manufactures slide gates, diverters, and loading spouts for dry bulk solids in gravity flow or pneumatic conveying systems. Our products are bespoke for individual applications. Vortex is the brand choice among agriculture, cement, chemical, coal, milling, and mineral industries.

**VSR INDUSTRIE-TECHNIK GmbH**

Am Alten Schacht 6  
Duisburg  
D-47198  
Germany  
**Contact:** Mr Wolfgang Schlabach  
**Job Title:** Export Manager  
**T:** + 49 20 66 99 66 40

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**F:** + 49 20 66 99 66 62  
**E:** info@vrs-industrietechnik.de  
**W:** www.vrs-industrietechnik.de  
*Products have been proving themselves in the bulk handling business for more than 39 years. Due to the specially designed and patented products, they have achieved a name for their high effectiveness and dependability.*

**WEATHERSOLVE STRUCTURES**

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 Langley  
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**WELLASIANA TECHNOLOGY Co, Ltd**

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**WOLF MATERIAL HANDLING SYSTEMS**

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**WOLF POINT ENGINEERS & CONTRACTORS**

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**W:** www.wolfpointengineers.com/  
*Wolf Point Engineers & Contractors (a Division of North Alabama Fabricating Company, Inc.) is a leading EPC Firm specializing in the implementation of Bulk Material Handling Systems for numerous industries including but not limited to the Power Mining, Pulp and Paper Industries.*

**WORLEY PARSONS CANADA (WESTMAR)**

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**W:** www.westmar.com

**WSP**

1600 Boul. Rene- Levesque West

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**WUVIO CHEMICALS INTERNATIONAL**

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**F:** + 31 1745 200 03  
**E:** info@wuvio.com  
**W:** www.wuvio.com  
*Wuvio supplies innovative and proprietary products to combat dust during handling and storage of dry bulk. Our aim is to suppress dust in an effective*

*and sustainable way. Our solutions are tailor-made for your specific situation.*

**VERNAUX-PASAGE**

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**ZAO SMM (CJSC SMM)**

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**W:** www.zaosmm.ru/



# COAL HANDLING EQUIPMENT SUPPLIED

## KEY

SL	=	shiploaders
SUL	=	ship-unloaders
GL	=	grab loaders
GUL	=	grab unloaders
G	=	grabs
CSU	=	continuous ship-unloaders
BL	=	barge loaders
BU	=	barge unloaders
SU	=	self-unloaders & equipment
BE/L	=	belt conveyors/loaders
S	=	stackers
R	=	reclaimers
S/R	=	stacker/reclaimers
C	=	conveyors & accessories
F-EL	=	front-end loaders
H	=	hoppers
MHE	=	mobile bulk handling equipment
Cr	=	crushing
Sc	=	screening
Bln	=	blending
Wg	=	weighing
S&I	=	sampling & inspection
DC	=	dust control & suppression
DC&A	=	drives, controls & automation
ES	=	enclosed storage
SS	=	stockyard systems
RL/U	=	railcar loaders/unloaders
EC	=	engineering consultants
O	=	other



	SL	SUL	GL	GUL	G	CSU	BL	BU	SU	BE/L	S	R	S/R	C	F-EL	H	MHE	Cr	Sc	Bln	Wg	S&I	DC	DC&A	ES	SS	RL/U	EC	O
2000 Engineering																													
4B BRAIME Components														✓										✓				✓	✓
A. Friedr Flender AG / Siemens											✓			✓									✓	✓			✓		
A/S Cimbrja	✓										✓			✓									✓		✓	✓	✓		
AAF International																							✓						
ABB AB	✓		✓	✓							✓		✓											✓				✓	
Abbey Rollers Limited																													
ABIAC	✓							✓			✓	✓	✓											✓		✓		✓	
Achenbach GmbH Metalltechnik														✓															
AFM Industries	✓										✓	✓														✓		✓	
Agrico Sales, Inc.	✓						✓				✓	✓		✓											✓		✓	✓	
AJ Edmond Company																													
Alex Stewart International Corporation Ltd																							✓						
ALS Inspection																						✓	✓						
Amec Foster Wheeler																													
AMECO SAS	✓	✓					✓	✓			✓	✓					✓			✓					✓	✓		✓	✓
Anindya																							✓						✓
Anvil Attachments					✓																								✓
Applied Conveyor Technology, Inc. DBA The ACT Group										✓	✓			✓		✓		✓	✓				✓	✓			✓	✓	✓
Arlona Engineering					✓						✓	✓		✓		✓											✓		
AS LNK Industries																													
ASGCO "Complete Conveyor Solutions"														✓										✓					
Ashton Bulk Ltd																													
Atlas Manufacturing Co. Inc					✓																								✓
August Penkert GmbH	✓																							✓					✓
AUMUND Foerdertechnik GmbH (AUMUND Group)											✓			✓															✓
Aurecon																													✓
Ausenco Engineering Canada Inc.	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B.V. BECO					✓																								
Babcock & Wilcox Loibl GmbH	✓										✓	✓	✓	✓															
Bauer Gear Motor																													
Bedeschi Mid-West Conveyor	✓	✓					✓	✓		✓	✓	✓	✓	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bedeschi SpA	✓	✓					✓	✓		✓	✓	✓	✓	✓		✓										✓	✓	✓	✓
Beijing HaoSheng Transmission Technology Co., Ltd.																													
Bekaert NV														✓															
Bendezu Port Equipment GmbH																													
Benetech GmbH																													

	SL	SUL	GL	GUL	G	CSU	BL	BU	SU	BE/L	S	R	S/R	C	F-EL	H	MHE	Cr	Sc	Bln	Wg	S&I	DC	DC&A	ES	SS	RL/U	EC	0
Benetech USA																													
Best Service Group (B.S.G.) bvba	✓				✓		✓	✓																✓				✓	
BEUMER Group GmbH & Co KG	✓	✓					✓	✓		✓	✓	✓	✓	✓													✓	✓	✓
BGS Holland																								✓					
Bilfinger Tebodin bv																													✓
Binder + Co AG						✓																							✓
Birrus International Pty Ltd															✓														✓
Blue Water Misting																								✓					
BLUG Credeblug S.L.	✓	✓	✓	✓	✓	✓	✓	✓	✓															✓	✓		✓		
Bogaert Transmission (GEHA)																								✓					
Bosch Rexroth B.V.	✓	✓				✓					✓	✓	✓	✓					✓						✓		✓		✓
Bosch Rexroth Mellansel AB																									✓				
BossTek																								✓					✓
Boyne Area Manufacturing (BAM)	✓						✓								✓		✓							✓			✓		✓
Brelko Conveyor Products																								✓					✓
Bridgestone Industrial Limited	✓																							✓					✓
Bridon International Ltd																													✓
BRUKS AB	✓										✓	✓	✓	✓					✓	✓						✓	✓		
BRUKS Klöckner GmbH																													
BRUKS Rockwood Incorporation	✓										✓	✓	✓	✓										✓			✓		
Bucket Mart Inc.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓
Bulk Cargo Handling BVBA																													
BULK.ID	✓	✓			✓	✓	✓	✓			✓	✓	✓	✓										✓					✓
Buttimer Engineering	✓	✓							✓	✓							✓	✓						✓	✓				✓
C Spencer Ltd																													
C. Christophel GmbH																													
Cable Arm Inc					✓																								
Cachapuz Bilanciai Group																													
Calim Grab Industry			✓	✓	✓												✓												
Cambelt International Corp											✓		✓														✓		✓
Capotex																													
Carbonser, S. A. DE C. V.						✓					✓		✓	✓					✓	✓	✓	✓	✓	✓	✓		✓		✓
Cargotec Sweden AB, Marine Selfunloaders						✓			✓																				
Carlsen Group	✓	✓							✓																				
Caterpillar (UK) Ltd.																													
Caterpillar Inc							✓	✓							✓														✓
Caterpillar SARL	✓	✓					✓	✓							✓														✓
Cavotec SA																													✓
CDM Systems, Inc	✓	✓					✓	✓							✓														✓
Changsha Kaiyan Instruments Co. Ltd																													
CHIA Espirales.es															✓									✓					✓
CHL Equipment Ltd (incorp. Verstegen Grabs UK)					✓																								
CICSA s.r.l.	✓	✓											✓	✓															
Cimbria Unigrain A/S	✓						✓																	✓				✓	
Cintasa Americas										✓	✓							✓									✓		✓
CINTASA S.A.																													
Cita Logistics LLC																								✓					
Cita Logistics LLC																								✓					✓
Civettini Italo & c sas (CFS Handling)					✓																								
Claudius Peters Projects GmbH	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓					✓		✓			✓	✓	✓	✓	✓	✓
Claudius Peters Technologies S.A.S											✓	✓	✓	✓			✓												
Cleveland Cascades Ltd																								✓					
Clough Limited	✓	✓	✓	✓		✓	✓	✓			✓	✓	✓	✓			✓		✓	✓	✓	✓		✓		✓	✓	✓	✓
CNBM International Engineering Co., Ltd.		✓								✓	✓	✓	✓																
Coal & Mineral Technologies (SABS)																													
Coal Control																													
COBRA Europe SA															✓														
Coeclerici Logistics S.p.A.																													
Coles Associates	✓	✓		✓		✓				✓	✓	✓	✓	✓														✓	✓
Conductix-Wampfler Australia																													✓
Conductix-Wampfler																									✓				✓
Conductix-Wampfler Americas	✓	✓				✓	✓	✓			✓	✓	✓	✓			✓							✓			✓	✓	✓
Continental Construction (Memphis)																													✓
Continental Conveyor & Equipment Co Inc	✓														✓														
CONTINENTAL MATADOR RUBBER, s.r.o.															✓														
ContiTech Antriebssysteme GmbH																													
ContiTech															✓														
Transportbandsysteme GmbH															✓														

	SL	SUL	GL	GUL	G	CSU	BL	BU	SU	BE/L	S	R	S/R	C	F-EL	H	MHE	Cr	Sc	Bln	Wg	S&I	DC	DC&A	ES	SS	RL/U	EC	O
Control Systems																													
Technology Pty Ltd																							✓						
Conveyor Dynamics, Inc.														✓															
Cotecna Inspection SA																							✓						
CPS Projects (Pty) Ltd	✓	✓		✓												✓									✓				✓
Cranes Machinery Co., Ltd(CMC)																													✓
CRS - Container Rotation Systems Pty Ltd																													
CST Covers																													
CST Storage													✓				✓										✓		✓
CWA Engineers Inc.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dalian Huarui Heavy Industry International CO. LTD																				✓	✓	✓					✓		
DCL, Incorporated	✓						✓				✓			✓		✓								✓			✓	✓	✓
De Regt Conveyor Systems														✓															
DeMarco Industrial Vacuum Corporation	✓	✓					✓	✓				✓															✓		✓
DemcoTECH Engineering	✓			✓			✓			✓	✓	✓		✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Den Bakker Dustrusting Technology b.v. (dbd global b.v.)																								✓					
Deutsche Großwälzlager DMN-WESTINGHOUSE														✓										✓					
Dome Corp of North America											✓													✓					
Dome Technology, LLC																								✓			✓		✓
DOMTEC International LLC																								✓					✓
Donaldson Europe b.v.b.a																								✓					
Donaldson Filtration																								✓					
Deutschland GmbH																													
Doppelmayr Transport Technology GmbH											✓			✓															✓
Dos Santos International, LLC	✓						✓	✓	✓	✓	✓			✓			✓											✓	✓
Doubrava Ges GmbH						✓								✓															
Dry-Bag A/S																													✓
Dunlop Conveyor Belting											✓			✓															
DURO FELGUERA, S.A.	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dust Solutions Inc																								✓					
E-Crane World Wide	✓	✓	✓	✓																									
E-Crane World Wide / E-Crane International USA	✓	✓		✓	✓		✓	✓								✓													✓
EDGE INNOVATE. (NI) LTD	✓						✓			✓	✓			✓		✓		✓	✓								✓		
Egis Ports																													✓
EIFFEL Etablissement SOMDEL	✓	✓				✓	✓	✓			✓	✓	✓	✓		✓					✓				✓	✓			
Elecon Engineering Co Ltd	✓						✓			✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓		✓	✓	✓	✓		
Elecon Singapore PTE Ltd.	✓													✓		✓		✓	✓	✓				✓					
Elgin Engineering and Construction							✓	✓		✓	✓	✓	✓	✓		✓		✓	✓	✓	✓				✓			✓	
EMS-Tech Inc	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓						✓	✓	✓	✓	✓	✓	✓
EMTICI Engineering Co Ltd														✓													✓		
Enco Engineering Inc	✓	✓				✓	✓			✓	✓	✓	✓	✓		✓		✓	✓	✓								✓	✓
Engicon nv	✓									✓	✓	✓	✓	✓		✓		✓				✓		✓		✓	✓	✓	✓
EPN Solutions																													
EQUIPO LLC			✓	✓	✓																								
Eriez Europe														✓															✓
Esch Group bv																									✓				
ESI Eurosil BV																				✓								✓	
Essar Industries																													
Euromec Srl					✓																								
Euro-Tramco BV						✓								✓															
F E Schulte Strathaus GmbH & Co KG														✓															
Fairport Engineering														✓						✓	✓				✓			✓	✓
FAM Magdeburger Förderanlagen und Baumaschinen GmbH	✓	✓		✓		✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Famur Famak S.A.	✓			✓	✓						✓	✓	✓	✓															
FAMUR S.A.														✓															
FELD Maschinen-und Industriebau GmbH																													
Fenner Dunlop Conveyor Belting Europe											✓			✓															
Fenner plc														✓															
FFE Ltd																													
Figee Crane Services BV	✓	✓	✓	✓			✓	✓								✓								✓				✓	✓
Flexco														✓															
Flexco Europe GmbH														✓															
Flexicon Corporation														✓															
Flexoveyor Conveyor														✓															
FLSmith A/S	✓	✓				✓		✓			✓	✓	✓	✓					✓		✓		✓		✓	✓	✓		
FLSmith GmbH														✓															
FLSmith Minerals Pvt. Ltd														✓															
FLSmith Wadgassen GmbH	✓	✓		✓		✓	✓	✓		✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

	SL	SUL	GL	GUL	G	CSU	BL	BU	SU	BE/L	S	R	S/R	C	F-EL	H	MHE	Cr	Sc	Bln	Wg	S&I	DC	DC&A	ES	SS	RL/U	EC	O
Franz Wölfer																													
Elektromaschinenfabrik																													
Osnabrück GmbH																													
Frigate Technologies	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Private Limited																													
Gama Endustri Tesisleri	✓	✓	✓			✓				✓	✓	✓	✓	✓		✓		✓	✓	✓						✓	✓		✓
Imalat Ve Montaj AS																													
Gambarotta Gschwendt														✓															
Ganz Danubius Trading Co Ltd					✓											✓													✓
General Kinematics Corp.														✓						✓									
Geo - Chem																						✓	✓						
Laboratories Pvt. Ltd																													
Geometrica Inc																													
Certech Handling Systems cc														✓											✓		✓		
GF MHS Srl	✓						✓			✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Golden West Industries																													
Guttridge Limited		✓												✓		✓													
Guven Grab and Machine					✓																								
Ltd. Co																													
Hangzhou Huaxin Mechanical																													
& Electrical Engineering Co., Ltd.																													
Hansen Industrial																													
Transmissions (HIT) Ltd																													
Hansen Industrial														✓															
Transmissions (HIT) nv																													
Hapman														✓			✓												
Hasel Machinery Inc																													
Haskoning India Pvt Ltd																													
HASLER GROUP SAS														✓		✓						✓							
HAUGEN System AB																													✓
HAUK & SASKO																													
Ingenieurgesellschaft mbH																													
Heyl & Patterson Equipment	✓				✓		✓	✓			✓	✓	✓				✓							✓	✓		✓	✓	✓
Division of The HALL Group																													
Hitachi Construction																													✓
Machinery (Europe) NV																													
HKD Blue																													
Horizon Conveyor Equipment										✓	✓	✓	✓	✓								✓							
HOSCH-Fördertechnik														✓															✓
Recklinghausen GmbH																													
Huadian Heavy Industries																													✓
Co., Ltd.																													✓
Hycontrol Limited																	✓												✓
Hyundai Heavy Industries Co	✓													✓															✓
IBAU HAMBURG	✓	✓				✓	✓	✓						✓															✓
Igus GmbH																													✓
IHI Transport Machinery	✓	✓	✓	✓		✓		✓			✓	✓	✓	✓													✓	✓	✓
Covan ., Ltd. (IUK)																													
IMASA																													
IMGS																													
IMO Germany																													
Imperial Technologies, Inc.	✓						✓	✓	✓	✓	✓	✓	✓	✓		✓		✓				✓				✓	✓	✓	✓
Incolab Services BV																													
Inspectorate International Ltd																													
Instral B.V.																													
Intermodal Solutions Pty Ltd																													
International Bulk Handling	✓						✓			✓	✓			✓		✓													
Technology BV																													
Intersystems														✓															
iSAM AG Gesellschaft fuer	✓	✓	✓	✓	✓		✓	✓			✓	✓	✓	✓								✓	✓				✓	✓	✓
angewandte Kybernetik																													
Isomonte SA	✓	✓			✓						✓																		
Italgru S.r.l																													
J & B Grabs b.v.					✓																								
James A. Redding Company																													
Jansen & Heuning																													
Jenike & Johanson Inc.														✓		✓												✓	✓
JFE Engineering Corporation																													
Jiangsu Zhendong Port																													
Machinery Manufacturing																													
Co., Ltd.																													
Jim Way Enterprise Co., Ltd	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓								✓	✓	✓
Johannes Hübner Fabrik	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
elektrischer Maschinen GmbH																													
Joy Global Inc																													
JSC RIKON	✓	✓	✓	✓	✓		✓	✓																					✓
JSC Tehnoros																													
Kalenborn Kalprotect GmbH																													
& Co. KG	✓	✓				✓			✓	✓	✓		✓	✓		✓		✓	✓								✓	✓	✓
KCT Grab Industry					✓																								
Kiepe Electric GmbH														✓															✓
Kinergy Corporation												✓								✓							✓	✓	✓



	SL	SUL	GL	GUL	G	CSU	BL	BU	SU	BE/L	S	R	S/R	C	F-EL	H	MHE	Cr	Sc	Bln	Wg	S&I	DC	DC&A	ES	SS	RL/U	EC	O	
Kingfisher Industrial Ltd	✓	✓				✓			✓					✓		✓		✓	✓							✓				
KINSHOFER GmbH					✓												✓								✓		✓			✓
Kiruna Wagon AB																														
Kleemann GmbH														✓					✓								✓			
Knight Energy Services Limited																						✓	✓					✓		
KOCKS ARDELT		✓	✓	✓			✓	✓									✓										✓	✓	✓	
KRANBAU GmbH																														
Komatsu Mining Corp.											✓	✓	✓	✓	✓	✓			✓									✓		
Konecranes (France)	✓	✓	✓	✓								✓	✓	✓	✓														✓	
Konecranes Finland Corp		✓	✓	✓				✓					✓	✓	✓										✓					
Konecranes Hafentechnik GmbH				✓		✓		✓				✓															✓		✓	
Konecranes Port Solutions - Konecranes GmbH	✓	✓	✓	✓			✓	✓										✓				✓								✓
KPI-JCI and Astec Mobile Screens	✓	✓					✓	✓	✓	✓	✓		✓	✓			✓	✓	✓	✓					✓		✓	✓		✓
Krech Ojard & Assoc																														
Kröger Greifertechnik GmbH & Co. KG					✓																									
Laing O'Rourke	✓	✓												✓																✓
Larsen & Toubro Limited																														
Lassing Dibben Consulting Engineers Ltd	✓						✓	✓	✓	✓	✓	✓	✓	✓			✓			✓			✓		✓	✓	✓	✓		✓
Lawrence Industries, Inc.														✓		✓														
Legacy Building Solutions, Inc.																														
Libran Engineering & Services	✓																									✓		✓		
Liebherr-Hydraulikbagger GmbH																														✓
Liebherr-MCCtec Rostock GmbH	✓	✓	✓	✓			✓	✓																						
Lion Bulk Handling b.v.																														
Listenow GmbH & Co.	✓	✓					✓	✓						✓										✓				✓		✓
Lycopodium																														
Macawber Engineering, Inc																														
MacGregor Group	✓	✓				✓	✓	✓	✓																					
MacGregor SWE AB																														
Mack Manufacturing Inc					✓																									
Mactenn Systems Ltd.																														
Mantsinen Group Ltd Oy	✓	✓	✓	✓	✓		✓	✓						✓																✓
Marine Inspection LLC																														
Martin Engineering												✓																✓	✓	✓
Martin Engineering GmbH																								✓	✓			✓	✓	✓
Maschinen und Mühlenbau Erhard Muhr GmbH	✓						✓	✓						✓							✓						✓			
Matrix PDM Engineering																														✓
MegaDome® Buildings by Harnois																											✓			✓
MegaRoller																														
Mentor Dynamics	✓							✓	✓						✓	✓	✓		✓											✓
Merrick Industries																														
Metso Minerals Industries, Inc.	✓		✓	✓	✓	✓	✓	✓			✓	✓	✓	✓								✓	✓			✓		✓		✓
Mideco																	✓													
Midwest Industrial Supply Inc																								✓	✓					
Midwest International Standard Products, Inc.	✓	✓																							✓			✓		✓
Mitsui Miike Machinery Co. Ltd.																														
Mobile Conveying Systems																														
Moffatt & Nichol																														✓
MoleMaster Services Corporation™																	✓										✓			✓
Monolithic Dome Institute																														
Motherwell Automation																									✓					
Motion Metrics																														
Motridal SpA	✓					✓	✓	✓			✓	✓			✓				✓	✓	✓	✓		✓				✓		✓
MRS Greifer GmbH		✓	✓	✓	✓																									
Nantong UP Machinery Engineering Co., Ltd																														
National Ports Corporation Limited																														
Natural Grabs					✓																									
NAVCO (National Air Vibrator Co)																														
Negrini Srl						✓																								
Nemag BV			✓	✓	✓		✓	✓											✓											✓
NEPEAN Conveyors Oy	✓							✓				✓	✓														✓			✓
NERAK GmbH Fördertechnik																														
Neuro Industrietechnik GmbH	✓					✓	✓	✓																						
NILOS GmbH & Co KG																														
NK Tehnologija SIA	✓							✓																						✓
NKM Noell			✓	✓																										✓
NKM Noell Special Cranes GmbH	✓	✓	✓	✓				✓	✓																					✓
NM Heilig BV	✓	✓	✓	✓				✓			✓	✓	✓														✓	✓		✓
NMH s.r.o																														

	SL	SUL	GL	GUL	G	CSU	BL	BU	SU	BE/L	S	R	S/R	C	F-EL	H	MHE	Cr	Sc	BIn	Wg	S&I	DC	DC&A	ES	SS	RL/U	EC	0	
Noell Crane Systems (China) Ltd																														✓
Nordströms Konstruktionsbyrå	✓																													
North American Crushing & Screening, LLC																			✓	✓	✓									
NSL Engineering Pte Ltd																														
oz. HENNLICH ENGINEERING																								✓						
Offshore Bulk Terminal Pte																														
Orthos Projects Ltd.				✓										✓		✓		✓	✓	✓	✓		✓	✓					✓	
ORTS GmbH Maschinenfabrik					✓																									✓
Oxbow Energy Solutions BV																														
P.T. Mitra S.K. Analisa testama																							✓							
PAGE MACRAE ENGINEERING					✓											✓														✓
Pakiet																														✓
Parker Hannifin Manufacturing Ltd.																							✓	✓	✓					✓
Parker Plant Ltd	✓									✓				✓				✓	✓					✓						
PEBCO®	✓							✓						✓			✓						✓					✓		✓
Peinemann Cranes																														
PEINER SMAG Lifting Technologies GmbH					✓																									✓
Peterson Agricare & Bulk Logistics BV																							✓							
Pfister Waagen Bilanciai GmbH																														
PHB Weserhütte, S.A.	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓					✓			✓	✓	✓	✓	✓	✓	✓
PHOENIX Conveyor Belt Systems GmbH											✓			✓																
PINTSCH BUBENZER GmbH																								✓						
Pirs SAS																														
PIV Drives GmbH – Dana Incorporated	✓	✓				✓				✓	✓	✓	✓	✓				✓						✓			✓	✓		
PLM Cranes B.V.				✓	✓		✓	✓	✓																					
Pneumat Systems Inc																✓												✓		✓
Polymer Industries - Ultrapoly Division																														✓
Portasilo Ltd														✓		✓						✓				✓				
Port-Trade AS	✓	✓	✓	✓	✓					✓							✓													
Powerscreen														✓					✓	✓										✓
Precia-Molen Nederland BV														✓		✓						✓								
Procon Engineering Limited																						✓	✓							
PT Armada Rock Karunia Transshipment																		✓												✓
PT Bukaka Teknik Utama																														✓
PT Carsurin																							✓						✓	
PT CCIC Jakarta																														
PT Geoservices																							✓							
PT Jakarta Prima Cranes																														✓
PT Mitra Bahtera Segarasejati																														✓
PT SpanSet Indonesia																														✓
PT Thiess Contractors Indonesia																														
PT. Bando Indonesia															✓															
PT. Thermalindo																							✓							
Sarana Labortoria																														
Qingdao Huaxia Rubber Industry Co. Ltd.	✓	✓								✓				✓			✓										✓			
QML Sservices																														✓
Quadrant Engineering																✓														✓
Plastics Products																														
Quality Handling Systems Pty Ltd																							✓							
Qube Ports & Bulk																														
R & S Srl / Roncuzzi - WAM Group	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						✓	✓	✓	✓		✓	✓	✓	✓
RAM SMAG Lifting Technologies	✓						✓																	✓				✓		
Rapat Asia																														
Rapat Corporation																														
RBL-REI France										✓	✓	✓		✓							✓	✓								
RC Inspection B.V																							✓							
Redaelli Tecna S.p.A.																														
REEL Alesa Ltd																														
REMA TIP TOP AG											✓			✓																✓
RHC Deutschland GmbH	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓		✓		✓	✓	✓	✓	✓
RHC Heavy Machinery Ltd	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						✓		✓		✓	✓	✓	✓
Richmond Engineering Works			✓			✓	✓	✓																						
Richwood Industries, Inc.																														✓
RINA Consulting S.p.A.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓		✓													✓	✓
Ringspann GmbH																									✓					
Risun Technologies																														
Roberts & Schaefer Company				✓	✓	✓	✓	✓																✓						✓
RockTree Logistics Pte. Ltd.																														✓
Ronin GMS													✓		✓							✓	✓		✓	✓	✓		✓	✓
ROXON	✓							✓						✓		✓	✓													✓
Royal Haskoning DHV	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rubb Buildings Ltd																														

	SL	SUL	GL	GUL	G	CSU	BL	BU	SU	BE/L	S	R	S/R	C	F-EL	H	MHE	Cr	Sc	Bln	Wg	S&I	DC	DC&A	ES	SS	RL/U	EC	O			
RULMECA HOLDING S.P.A.																														✓		
SABS - Mining & Minerals																							✓									
Sammi	✓						✓			✓	✓			✓		✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		
Sampling Associates International																							✓									
SAMSON Materials Handling Ltd (AUMUND Group)	✓	✓					✓			✓				✓		✓	✓											✓		✓		
Sandvik Mining and Construction (China) Co., Ltd.	✓		✓	✓		✓	✓	✓		✓	✓	✓	✓	✓		✓			✓	✓	✓				✓		✓	✓	✓	✓		
Scantech International																					✓		✓									
SCHADE Lagertechnik GmbH (AUMUND Group)											✓	✓	✓								✓					✓	✓	✓				
Schenck Process											✓	✓		✓		✓				✓						✓	✓	✓				
Schenck Process UK Limited	✓										✓	✓		✓						✓						✓	✓	✓		✓		
Schrage Rohrketten-system GmbH Conveying Systems																																
Scorpio Engineering Pvt. Ltd	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓					✓	✓		✓		✓	✓					
Seabulk Inc	✓								✓																					✓	✓	
Selpeco Resources Inc.	✓						✓			✓	✓	✓	✓	✓		✓					✓			✓		✓	✓	✓	✓	✓		
Sempertrans														✓																		
SENNEBOGEN Maschinenfabrik GmbH	✓	✓	✓	✓			✓	✓									✓															
Sensor Technology Ltd																							✓			✓						
SERAM	✓		✓	✓			✓	✓															✓			✓					✓	
SESCOTRANS For Developed Logistics (SAE)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓		✓	✓	
SEW-EURODRIVE GmbH & Co KG																																
SGS (Nederland) BV																								✓								
SGS Australia Pty Ltd																								✓								
SGS Minerals Services																								✓								
SGS Minerals Services																					✓	✓	✓				✓				✓	
Shanghai Global Machinery Co., Ltd (SGMC)																																
Shanghai Guan Hai Engineering Co.,Ltd	✓	✓		✓	✓	✓	✓			✓	✓	✓	✓	✓		✓						✓					✓			✓		
Shanghai Guanbo Machinery Equipment Co.,Ltd					✓																											
Shanghai Janus Grab Co., Ltd.			✓	✓	✓											✓																
Shanghai Peiner Smag Machinery Co.,Ltd																																
Shanghai Qifan Co., Ltd.		✓			✓																											
Shanghai Yo-Pi Port Machinery Co. LTD																																
Shanghai Zhenhua Port Machinery Co (ZPMC) Ltd	✓	✓	✓	✓			✓	✓			✓	✓	✓	✓												✓				✓		
Shanthy International					✓																											
Shaw Almex Canada																																
Shi.E.L.D. Services srl	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
SIBRE - Siegerland Bremsen GmbH																															✓	
SIDERAR / TERNIUM	✓	✓				✓																										
Siebtechnik GmbH																				✓	✓		✓									
Siemens AG International	✓	✓		✓	✓																											
Siemens Nederland NV																										✓						✓
SIG Società Italiana Gomma Spa																																
Simplicity Projects Pvt Ltd		✓																														
Siwertell AB	✓	✓				✓	✓	✓		✓				✓																		
Sly Incorporated																									✓			✓			✓	
SMB International GmbH	✓						✓			✓	✓	✓	✓	✓																	✓	
Smiley Monroe Ltd																															✓	✓
SMM - Sociedade de Montagens Metalomecnicas SA																																
Solitec Engineering Ltd																	✓															
Sotecma inc	✓	✓							✓	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓		✓			✓	✓	✓	✓	✓	
STAG AG																																
Stemm Equipos Industriales, S.L.			✓	✓	✓		✓	✓									✓														✓	✓
Stewart Inspection and Analysis (Pty) Ltd																								✓								
STM srl	✓						✓			✓	✓			✓		✓	✓	✓	✓	✓	✓	✓		✓			✓	✓			✓	
Stokman BV		✓					✓	✓						✓																	✓	✓
Strudes Inc	✓	✓			✓	✓	✓			✓	✓	✓	✓	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
STUDIO TECNICO MALNATI SAS											✓			✓						✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sucofindo																																
Sumitomo Heavy Industries Material Handling Systems Co., Ltd.	✓	✓		✓		✓	✓	✓			✓	✓	✓	✓													✓	✓				
Superior Industries, Inc.	✓	✓					✓	✓		✓	✓	✓	✓	✓		✓													✓			
Svendborg Brakes USA, LLC																										✓						
Swire CTM Bulk Logistics							✓	✓	✓																							
Synergy Engineering Ltd																																

	SL	SUL	GL	GUL	G	CSU	BL	BU	SU	BE/L	S	R	S/R	C	F-EL	H	MHE	Cr	Sc	BIn	Wg	S&I	DC	DC&A	ES	SS	RL/U	EC	0
TAIM WESER GmbH	✓	✓									✓	✓	✓	✓															
TAKRAF GmbH	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓				✓	✓	✓						✓	✓		
TBA Doncaster																						✓			✓		✓	✓	✓
techNaero aps																								✓					
Telestack Limited	✓	✓					✓	✓		✓	✓	✓	✓	✓		✓								✓	✓		✓	✓	✓
Tema BV																		✓	✓				✓	✓					✓
TEMA Systems Inc.																							✓	✓					
TENOVA S.p.A - Tenova	✓	✓		✓		✓	✓	✓			✓	✓	✓	✓		✓						✓			✓	✓	✓	✓	
Takraf Italy																													
Terex Deutschland GmbH		✓			✓																						✓		
Teufelberger Seil Ges.m.b.H		✓		✓				✓	✓	✓				✓															✓
The China Navigation Co. Pte. Ltd							✓	✓	✓																				
The Grab Specialist b.v.					✓																								
The Raring Corporation																								✓					
Thermo Fisher Scientific										✓				✓							✓	✓	✓		✓				
THIELE GmbH & Co KG											✓	✓	✓	✓													✓	✓	✓
thyssenkrupp Industrial Solutions (Canada) Inc.	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓						✓	✓	✓	✓
thyssenkrupp Industrial Solutions (USA), Inc.	✓	✓	✓	✓		✓	✓	✓			✓	✓	✓	✓				✓	✓						✓	✓	✓	✓	✓
thyssenkrupp Industrial Solutions AG	✓	✓	✓	✓		✓	✓	✓			✓	✓	✓	✓		✓		✓	✓	✓					✓	✓	✓	✓	✓
thyssenKrupp Industrial Solutions South Africa - Resource Technologies	✓	✓	✓	✓		✓	✓	✓			✓	✓	✓	✓		✓		✓	✓	✓				✓	✓	✓	✓	✓	
TMEIC																													
TMSA Tecnologia em Movimentação S/A	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓			✓	✓	✓	✓	✓			✓	✓	✓	✓
Topcon Technology Ltd																						✓							
Tramco, Inc																													✓
Trans-Global Solutions, Inc.																													✓
Transship LTD																													✓
TRF Limited (TATA)	✓	✓	✓	✓			✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓			✓	✓	✓
Triodetic																								✓					
Triple Point Technology																													✓
Tsubaki Kabelschlepp GmbH	✓	✓	✓	✓		✓	✓	✓			✓	✓	✓	✓										✓			✓	✓	✓
Tsubakimoto Bulk Systems Corporation																													✓
TTS (Transportation Technology Systems) LLC	✓	✓					✓	✓		✓	✓	✓	✓	✓		✓	✓									✓	✓	✓	✓
TTS HuaHai Ships Equipment																													✓
TTS Marine AS	✓	✓			✓										✓												✓		✓
V D D B (Pty) Ltd																													✓
Veenstra Machinefabriek B.V.	✓																							✓					✓
Ventyx																													✓
Verachtert Nederland B.V.					✓																								✓
Verstegen Grippers BV					✓																								✓
Vibco Inc																								✓				✓	✓
Vibrafloor		✓				✓		✓				✓												✓			✓	✓	✓
Vollert Anlagenbau GmbH																													✓
Volvo Construction Equipment																		✓											✓
Vortex Global	✓																												✓
VSR Industrietechnik GmbH																								✓					✓
WeatherSolve Structures																								✓					✓
Wellasiana Technology Co, Ltd																													✓
Wirtech AG																													✓
Wolf Material Handling Systems																													✓
Wolf Point Engineers & Contractors	✓		✓	✓			✓	✓		✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Worley Parsons Canada (Westmar)	✓	✓																						✓			✓	✓	✓
WSP																													✓
Wuvio Chemicals Internationa																								✓					✓
Yemaux-Passage																							✓						✓
ZAO SMM (CJSC SMM)																													✓

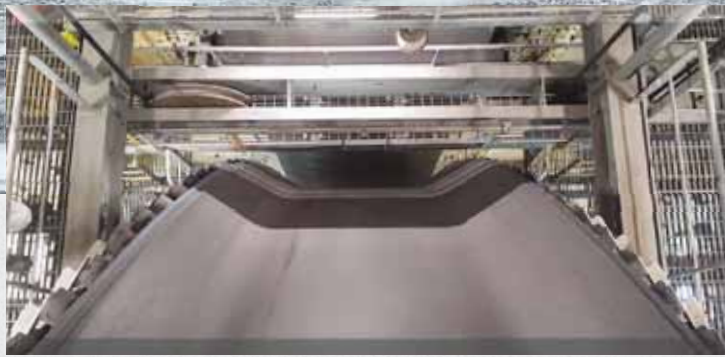


TRANSFORMING

engineering

INTO

productivity



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- Low maintenance costs



[www.ems-tech.net](http://www.ems-tech.net)

A night-time photograph of the Dubai skyline, showing numerous illuminated skyscrapers and a marina with boats in the foreground. The sky is a deep blue, and the city lights are reflected in the water.

# Coal or Nothing

Shaping landscape of the future