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FEATURES

- **European Coal Trades**
- **Coal Handling Directory**
- **Stockyard Technologies**
- **Loading Technologies**
- Floating Cranes & Offshore Stevedoring

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Steelpaint GmbH W: www.steelpaint.com

PUBLISHERS

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

EDITORIAL

Louise Dodds-Ely Editor

louise@dc-int.com

Jay Venter editorial@dc-int.com

Directories

Deputy Editor

Samantha Smith directories@dc-int.com

Bernice van Wyk Office Manager

accounts@dc-int.com

SALES

Matthew Currin Senior Sales sales2@dc-int.com Executive **Zack Venter** Advertisement Sales

sales@dc-int.com Executive

CORRESPONDENTS

Patrick Knight Brazil India **Kunal Bose** Europe **Barry Cross** Maria Cappuccio UK UK Michael King **Richard Scott**

ADMINISTRATIVE OFFICE

Business Publishing International Corporate Park, 11 Sinembe Crescent La Lucia Ridge, South Africa, 405 I Tel: +27 31 583 4360 Fax: +27 31 566 4502 Email: info@dc-int.com

Twitter: twitter.com/drycargomag

HEAD OFFICE

Trade Publishing International Limited Clover House, 24 Drury Road, Colchester, Essex CO2 7UX, UK Tel: +44 (0)1206 562552 Email: info@dc-int.com Website: www.drycargomag.com Twitter: twitter.com/drycargomag ISSN 1466-3643

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OCTOBER 2024 issue

featuring...



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COAL HANDLING DIRECTORY



Restraints may affect grain & soya trade

signs of added support for commodity import demand in a range of countries have become more visible in data emerging recently. These positive elements could enable the world seaborne dry bulk trade trend to continue strengthening into 2025.

Benefits derived directly from advances in economic activity in the main dry bulk commodity importing countries currently are modest. OECD economists in their latest end-September assessment nevertheless emphasize that "global output growth has remained resilient and inflation has continued to moderate". World GDP growth is forecast to stay almost unchanged at 3.2% in both 2024 and 2025 after a similar 3.1% last year.

GRAIN & SOYA

Indications pointing to a mixed pattern of grain and soya trade during the next twelve months have emerged. Following a strong performance through most of this year, tentative estimates for the period ahead suggest that momentum may slow or reverse, although import demand in numerous countries is not easily predictable.

Prospects for soyabeans and meal trade suggest that further expansion may prove elusive. As shown in table 1, US Department of Agriculture calculations published in mid-September showed a 17mt (million tonnes) or 7% increase in world soya trade within the 2023/24 marketing year just ended, to 248mt. In 2024/25 now starting, the

upwards trend may flatten. China's imports are expected to decrease from the record high volume seen in the past twelve months, offset by growth elsewhere.

COAL

Global import demand for coal has been well supported this year and may remain buoyant in the year ahead, although there are doubts about whether some countries' purchases will remain as elevated as seen recently. Positive influences are still evident, but potential negative changes also are clearly an element that is likely to have a weakening effect eventually.

A slightly downbeat forecast is contained in the latest quarterly update prepared by analysts at the Australian Government Department of Industry. This report suggests that global trade in steam and coking coal (including land movements, but mostly seaborne), could be marginally lower by 13mt or 1% in 2024, compared with last year's 1,462mt volume, at 1,449mt. Steam coal trade may be under 1% lower at 1,108mt, while coking coal trade decreases by 2% to 341mt.

IRON ORE

Sustained annual growth in world seaborne iron ore trade seems likely to be achieved during 2024, but the incremental volume is dependent on China's import expansion. In the 'other importers' group comprising about a quarter of the global total, an increase

seems unlikely, amid weakness in the European Union and Japan.

In the first eight months of 2024, iron ore imported by China totalled 815mt, a 5% rise compared with last year's same period. This strong performance may not continue, however. Restraints on steel demand in China's domestic market have been reflected in a 3% steel output reduction within this period, implying lower raw materials inputs are required. Additional ore imports have been used to rebuild port stocks.

MINOR BULKS

Trends in minor bulk trades movements suggest that a broadly positive pattern in this huge segment is unfolding. Global volumes of many industrial and agricultural commodities seem to be expanding in 2024. More activity in the steel products, forest products and bauxite/alumina trades, together comprising over two-fifths of the total, is evident.

BULK CARRIER FLEET

Among bulk carrier size groups, the 'Panamax' (70–99,999 deadweight tonnes) segment, including kamsarmax vessels, is maintaining solid growth. Newbuilding deliveries in 2024 are expected to be similar to last year's level, as shown in table 2, while scrapping remains quite low. The resulting estimated fleet deadweight growth of about 3.5% over the twelve months to end-2024 is similar to that seen in several previous years.

TABLE 1: WORLD SOYABEANS AND SOYAMEAL IMPORTS (MILLION TONNES)						
	2019/20	2020/21	2021/22	2022/23	2023/24*	2024/25*
European Union	31.4	31.3	31.1	29.2	30.1	30.8
China	98.6	99.8	90.4	104.5	111.6	109.1
Other Asia	38.0	38.4	38.2	36.8	39.2	41.4
Others	61.3	62.0	62.0	60.6	67.0	67.7
World total	229.3	231.5	221.7	231.1	247.9	249.0
% change from previous year	+9.1	+1.0	-4.3	+4.3	+7.3	+0.4

source: US Dept of Agriculture, 12 September 2024 October/September marketing years * forecast

TABLE 2: PANAMAX (70)-99,999 DWT) BULK CARR	IER FLEET (MII	LION DEADWE	IGHT TONNES)	
	2019	2020	2021	2022	2023	2024*
Newbuilding deliveries	11.4	12.0	8.6	9.8	10.9	10.5
Scrapping	0.4	1.0	0.7	0.8	2.3	1.5
Losses	0.1	0.0	0.0	0.0	0.0	0.0
Plus/minus adjustments	0.0	-0.1	0.1	0.1	-0.1	0.0
World fleet at end of year	217.6	228.5	236.5	245.6	254.1	263.0
% change from previous year-end	+5.3	+5.0	+3.5	+3.8	3.5	3.5



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Ocean freight market developments for grains continue subdued

ixed movements were seen in dry bulk freight rates in the period from mid-August to mid-September, as the benchmark Baltic Dry Index gained by a net 9% month-on-month, with values quoted around one-third higher year-on-year. Although vessel earnings in the grains and oilseeds carrying sectors declined over the past month, this was more than offset by a solid rebound in demand for the largest Capesize vessels.

Reflecting declines in both timecharter rates and fuel costs, the IGC's Grains and Oilseeds Freight Index retreated by 6% month-on-month, led by a marked drop in rates from Brazil and Argentina, while gains were recorded in Australia.

While logistical and security challenges continued to shape dry bulk markets, a marked upturn in grains and oilseeds shipments via the Suez Canal was noted during July, representing the first monthon-month increase since the onset of the Red Sea crisis in October 2023. As Black Sea traders continued to utilize the Canal, volumes were boosted by increased sailings from Ukraine and Russia to Asian destinations amid progressing winter wheat harvests in the region. However, the number of transits retreated again in August.

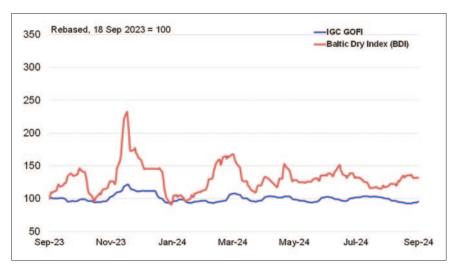
Transits made via the Panama Canal reached near-normal levels during August, amid improved conditions on the Gatun Lake following earlier rains. Grains and

oilseeds shipments for the month were estimated to be broadly in line with the prior season, albeit as bulkers continued to report challenges in booking available slots. In contrast, some key inland waterways elsewhere, such as the Parana River and Amazon Rivers in South America and the Mississippi River in the US, fell to critically low levels amid subdued rainfall, which restricted navigation and cargo movement.

The Panamax sub-Index eased by 4% m/m, with values down by 10% year-onyear. Sentiment remained under pressure for most of the month, notably in the Atlantic, where tonnage was ample amid tepid grains and oilseeds shipments from Brazil and the US, albeit with some improvement noted recently. Moreover, an easing of restrictions at the Panama Canal helped to shift a portion of dry bulk demand into smaller Supramax vessels, which were reportedly able to traverse the Canal's older locks whilst fully laden. Panamax rates in the Pacific found some support from consistent coal requirements from Indonesia.

The Supramax sector fared relatively better, finishing just 2% down from mid-August, as weak demand in Europe and the Mediterranean was partly offset by rising activity at the US Gulf, including for grains. Handysize rates also retreated, down by 7% m/m, led by a decline in South America, amid a subdued level of enquiries.

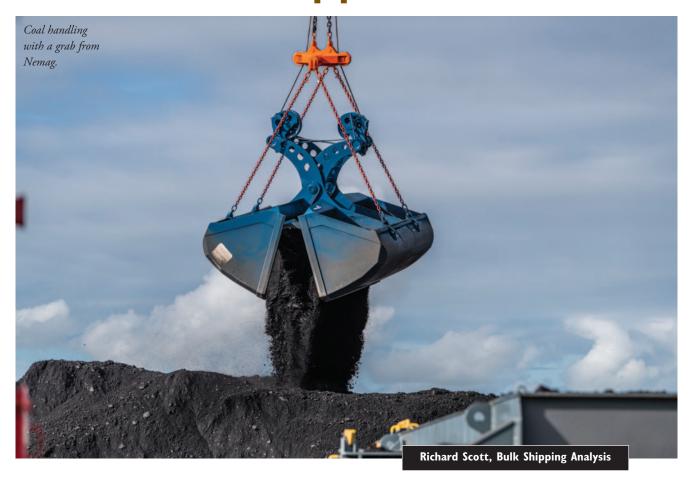
Peter Clubb, market Analyst, International Grains Council.



Trend of Baltic Dry Index and IGC GOFI (Grains and Oilseeds Freight Index) Sources: IGC, Baltic Exchange.



European importers' coal appetite fades



Coal imports into Europe dropped sharply in the past year and look set to diminish again during 2024. After the pandemic-induced downturn four years ago a recovery began in the next twelve months and was then boosted by the effects of the energy crisis caused by the war in Ukraine. Consequently 2022 imports surged but the benefits proved temporary, and last year's total was greatly reduced. A continuing downwards trend seems predictable.

Annual volumes into Europe remain a sizeable part of the world coal market, however. Numerous mainly long-haul cargoes to destinations around Europe are carried by bulk carriers of varying capacities. Related activity discharging cargoes is a feature at many bulk commodity handling ports throughout the region, both in northern European countries and in the Mediterranean area.

Imports into the European Union plus United Kingdom in 2023 were a prominent

but diminishing element of global seaborne coal trade. Steam coal, used mainly in power stations, formed the largest proportion received, about three-fifths of the regional volume. Coking coal for steel industry use comprised the remaining two-fifths. Negative influences emerging last year were mainly evident in the steam coal category, reflecting the energy crisis receding accompanied by the persisting shift towards alternative cleaner energy sources especially renewables.

Among individual importing countries Germany is by far the biggest, forming over one-third of the volume, as shown in the table. The Netherlands is the next largest albeit with only a one-tenth share, followed by Italy and France. One common explanation for diminishing annual volumes is the continuing trend of coal-fired power station closures that started many years ago, causing reduced consumption and imports.

USAGE DRIVERS

Europe's coal demand and imports reflect broad macro-economic trends shaping energy usage, although that influence is not usually the most noticeable factor determining volumes. Regional and national government environmental and energy policy pressures are often more prominent. The European economy's performance has been sluggish in the past couple of years.

According to the latest outlook for the world economy published by the OECD organization in late September, gross domestic product growth in the eurozone group of countries was a minimal 0.5% in 2023 after achieving a brisk 3.4% in the previous twelve months. Moreover, this year may see only a slight improvement to a 0.7% growth rate and in 2025 a low 1.3% is forecast, emphasizing how much activity is being depressed by restrained spending trends.

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EUROPE'S SEABORNE COAL IMPORTS (MILLION TONNES)						
	2019	2020	2021	2022	2023	2024*
France	9.8	6.8	7.5	7.6	6.0	4.5
Germany	40.2	29.2	37.4	40.9	29.3	24.0
Italy	10.6	7.6	8.4	12.0	7.2	4.0
Netherlands	10.9	4.2	9.3	11.6	8.4	7.5
Spain#	6.6	1.9	3.3	7.7	4.4	2.0
Other EU+UK	31.0	20.0	24.2	41.7	28.8	23.0
Total EU+UK	109.1	69.7	90.1	121.5	84.1	65.0
% change		-38.6	29.3	34.9	-30.8	-22.7

^{*} forecast #steam coal

After reviving from the adverse impact of the pandemic, headwinds emerged as higher interest rates were imposed amid soaring energy prices and accelerating inflation. Economic activity slowed sharply, weakening the demand for energy and affecting coal consumption. The subdued OECD forecasts for GDP growth reflect the ongoing restraint of higher albeit falling interest rates, amid falling inflation, and the difficulty of returning growth to a more robust trajectory.

In the recent report OECD economists suggest that the eurozone's GDP growth could "benefit from policy rate reductions and the further recovery in real incomes" over the period through 2025. But the modest acceleration to a pace remaining low that is envisaged seems to be a tentative expectation, and probably will not have a noticeable impact on demand for energy.

Patterns of coal consumption will depend upon how the main consuming sectors — power stations and steel mills — progress. Output trends in these sectors are likely to be curbed by the continuing subdued economic activity. Assuming that recent improvements in the region's overall energy supplies are maintained, coal usage and imports especially of steam coal grades could be further restricted in the period ahead.

IMPORTER CHANGES

Imports of coal into the European Union plus United Kingdom (EU+UK) plummeted during 2023, almost completely reversing the previous year's expansion. All the principal importing countries recorded declines in the past twelve months. Based on available data for the trend so far this year and signs of volumes in future months, the current pattern suggests that in 2024 as

a whole further annual reductions will be experienced in most countries.

Coal imported by sea into the EU+UK in 2023 totalled 84mt (million tonnes), a fall of 37mt or 31% compared with the previous year's 122mt, based on Clarksons Research data and Bulk Shipping Analysis calculations, summarized in the table above. An especially large reduction was seen in Germany, contributing a third of the regional downturn. The regional decline followed a 31mt (35%) increase in 2022.

Within the coking coal segment European imports increased by 9% to about 36mt in 2022, before falling by 9% to 33mt last year. In the larger steam coal component a 50% increase to 85mt in 2022 was followed by a 40% fall to 51mt in 2023. Coking coal is an essential ingredient used in the production of steel by the blast furnace/pig iron process. Steam coal, especially the volumes used by power



source: Clarksons Research, Bulk Shipping Analysis, September 2024

stations, can be substituted in the electricity generating sector by other fuels or replaced by renewable power generation.

At 6% of the world total last year, EU+UK imports are far below the much larger proportion of global seaborne coal trade seen several years ago when the proportion was 12%. Moreover European environmental policies eliminating coal consumption are likely to ensure that the earlier proportion of global trade is not regained.

Germany is still the largest European coal buyer, even though its annual volume is below the levels seen previously. Seaborne steam and coking coal received by German power stations, steel mills and other users totalled 52mt in 2016, comprising 36% of the EU+UK quantity. Last year's 29.3mt total — 11.6mt or 28% lower than seen in the preceding twelve months — saw Germany retaining the biggest percentage share of the overall European volume, at 35%

Other importers also experienced large reductions in 2023, compared with the previous year. Spain's steam coal imports were 43% down at 4.4mt, while Italy's steam and coking coal total fell by 40% to 7.2mt. In the Netherlands a 28% decline in overall imports to 8.4mt was recorded, accompanied by a 21% fall in France to 6.0mt, as shown by the table. A category in the table labelled 'other EU+UK' coal imports saw a decline of 30% last year to 29mt. UK imports were down to below 3mt, a 66% annual fall.

In a country adjacent to the European area, Turkey, sometimes included in regional import totals, the trend was in the opposite direction to that seen elsewhere. Turkey is a significant coal importer, receiving large annual volumes in recent years. The 2023 total exceeded 25mt, 10% above the previous year's volume and regaining a similar level to that seen in earlier periods. Steam coal mainly for power station use is the chief component, comprising four-fifths.

MARKET INFLUENCES

An extensive programme of coal-fired power station closures was one of the main trends adversely affecting coal usage and imports, in numerous European countries during recent years. Many plants were shut down or idled, or their capacity utilization declined. According to Euracoal, the European Association for Coal and Lignite, this trend reflected high Emissions Trading System carbon prices, effectively rendering coal uncompetitive against other energy sources.

A rapid shift towards alternative energy sources accompanied this trend. particular, increasing availability renewable energy supplies, especially windturbine generated electricity, was a prominent feature. In the 2021-2022 period, influences on coal consumption were temporarily disrupted and modified by European energy market changes. These changes were caused by an economic recovery from the pandemic's recession, and then by the crisis for energy supplies resulting when gas imports from Russia were drastically reduced. Amid improved energy supplies in 2023, the underlying negative influences on coal requirements were reasserted, weakening import purchases.

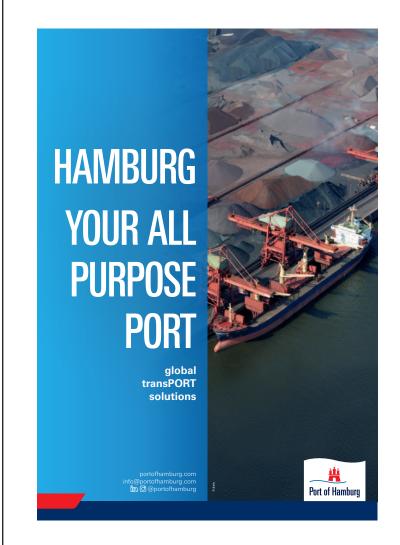
Variations in domestic coal production volumes within Europe, and effects on overall market supplies, are another influence, but now have only a limited impact on import demand because this domestic output is relatively small. Closures of uneconomic mines have been seen in recent years. Hard coal production is now mostly confined to Poland. Additionally, low grade lignite (brown coal) is mined, mostly in Germany and Poland.

Based on Euracoal figures, in 2023

Germany produced 102mt of lignite while hard coal output since 2018 has been nil. Poland's production last year was 40mt lignite plus 48mt hard coal. There was also under 1mt of UK hard coal output from remaining small mines. Among other EU importing countries domestic hard coal production was insignificant.

Changes in the coal consumption trend have become the main influence affecting European countries' purchases on the international market, as a result of the diminished influence of domestic coal output within Europe. In addition to the two principal industries still using coal — steel production and electricity generation — cement and other industries are consumers.

In the past few years steel mills' use of, and import demand for, coking coal remained fairly stable after recovering from a downturn during the pandemic. Imported volumes weakened last year amid lower steel output across the European region. In the much bigger steam coal segment, disruptive influences in recent years had a huge impact. Energy market changes affecting coal consumption reflected both economic and political drivers as already mentioned. Lower







energy use when the pandemic occurred was followed by a revival, while the subsequent gas shortages supported coal usage temporarily until the downwards pressures resumed as the dominant factor.

According to Energy Institute calculations, in 2023 Europe's electricity generation from coal contributed 14% of all electricity generated, lower than the previous year's 17% and well below the proportion recorded in earlier years. Meanwhile renewables generation from wind, solar, hydro and biofuels has risen strongly. These statistics emphasize the restraints on coal use in power stations and underline the direction of the trend.

The principle shares of Europe's electricity generation in 2023 comprised renewables — wind and solar power — (30%), and nuclear (19%) The remainder was comprised mostly of gas (17%), hydroelectric (17%) and coal (14%). But the renewables contribution is subject to considerable short-term variations because of its dependence upon often unpredictable weather, while hydro-power also can be affected by weather variations. However, coal is no longer seen as a valuable back-up alternative source of power supplies, a role mainly now focused on natural gas and nuclear generation plants.

POLICY IMPERATIVES

Promoting cleaner energy resources and reducing air pollution within the European Union is a long-established priority for environmental policy. Decarbonizing energy-consuming activities is a central aim contributing to cutting greenhouse gas emissions. Coal-fired power stations, especially large-scale plants, many of which have been phased-out, were one major focus for the strategy. Intensive development of renewable energy — with wind power generation becoming a feature - has been evident in recent years.

Volumes of coal used have been adversely affected by policy measures agreed by EU member countries, such as the Emissions Trading Scheme, air pollution directives and renewable energy targets. The objective is to ensure sustainability, mitigating climate change in particular. Other aspects such as energy security and industrial competitiveness also are being given more attention. The unfavourable impact that uncertain or disrupted energy supplies and prices have on economic activity has been clearly seen in the past few years.

Although coal continues to be part of the 'baseload' reliable generation capacity still needed in a number of European countries, its role has diminished greatly. EU member countries retain importdependent coal-fired plants operating, amid an intention to reduce and eliminate coal's contribution in the power sector. This policy probably will ensure a declining steam coal market in the years ahead.

Ceasing power generation from coal by set dates during the period up to the end of the present decade is part of plans previously revealed by European countries. In France, Italy, Netherlands and the UK deadlines announced were within the 2022-2029 period. In Germany, which has the largest coal-fired plant sector, a later target date of 2038 was proposed for phasing out electricity generation from both hard coal and lignite. The last UK coal-fired power station was closed at the end of last month.

Assisting this process is the reduced cost of renewable power technology. Enhanced wind and solar power efficiency and often lower costs have altered the economics of and perceptions for alternative energy supplies. Nevertheless, while the transition provides clear benefits, switching to other energy sources on the scale required to replace all coal-fired capacity is a substantial change that could be prolonged. In some countries closing coal-fired power stations is a major and extended procedure likely to continue over a number of years.

A significant additional policy influence implemented over two years ago in August 2022 was the European Union's ban on coal imports from Russia, in response to the invasion of Ukraine, as part of the EU's sanctions regime. Russian volumes previously formed a large proportion of regional coal imports. This action resulted in European buyers turning towards other suppliers and altered the global pattern of coal trade.

CONTINUED WEAKNESS

Ample energy availability in Europe seems to have been largely restored, although there is still some uncertainty about short-term gas supplies during the approaching winter months — when demand increases — into early 2025. Shortages are limited by subdued economic activity, reflected in energy consumed by the main users, which seems unlikely to accelerate rapidly in the near future despite a boost from a falling interest rates trend. Demand for the products of coal-consuming industries — electricity generation and steel production in particular — could remain restrained in the period ahead.

The International Energy Agency, in a recent (July) update on the global coal market, suggested that the downtrend in Europe's overall demand for coal is likely to persist. After falling by 22.5% in 2023, IEA analysts expect EU coal demand to decline by a further 19% in 2024, "mostly driven by the electricity sector, where the expansion of renewables continues while demand remains relatively weak". The combined reduction of almost a quarter over two years emphasizes the shrinkage under way in the European coal market.

As a result of this negative pattern a decrease in European coal imports seems likely this year. The 2024 annual seaborne coal volume imported by the EU+UK area could be down by about a fifth from last



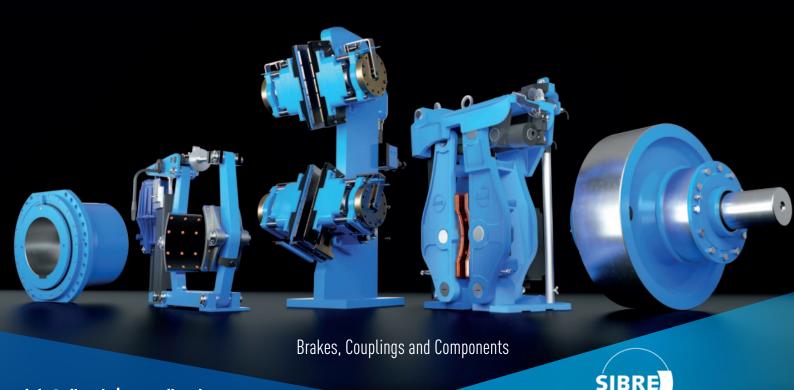
year, as shown in the table, to under 70mt, based on Bulk Shipping Analysis calculations. In the coking coal imports segment signs of weakness are somewhat less obvious, suggesting that the total may not weaken at such a rapid rate. The reduction is expected to be concentrated in the steam coal segment — especially in the power generation market — where a fall of around a third could occur.

Looking at the prospects for Europe's coal imports in 2025 and beyond, precise calculations are largely speculative, because of a variety of uncertainties surrounding energy market trends and the significance of coal. However, even when assumptions of improving economic growth and energy

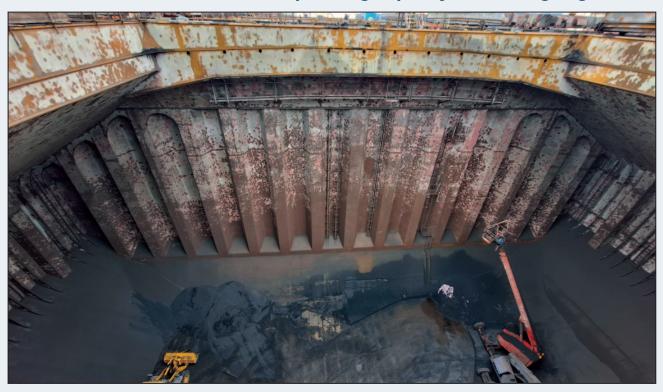
consumption are incorporated, other influences on coal use suggest that downwards pressure on imports can be expected to persist.

During an extended period ahead of more than two decades, when limiting and largely eliminating greenhouse gas emissions remains a global target, environmental pressures are set to intensify. Energy-consuming major industries such as power generation and steel production are focusing on decarbonizing their activities, so coal demand is likely to be adversely affected. The consequences for Europe's coal imports are clear, although the timing and magnitude of reductions is less predictable.

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Vive la différence: comparing Epoxy Coating against



'HANNES OLDENDORFF' - EPOXY COATING

New Building 2017

Jiangsu New Hantong Ship Heavy Industry Co. Ltd, Tongzhou, China.

Approximately 70% of the old epoxy coating had to be removed by high-pressure jetting, then the whole area was recoated after 3.2 years.

TANK TOPS

Pit corrosion already beginning after three years.

CONCLUSION

After only 3.2 years — enormous effort and expense.

Attacks on ships in Ukraine threaten 1% of dry bulk market

In a recent edition of BIMCO's 'Shipping Number of the Week', Shipping Analyst at BIMCO, Filipe Gouveia, looks at the recent attacks on merchant ships in Ukrainian ports and waters and the effect it could have on exports.

"Since September 2024, five merchant ships have been hit by Russian missiles while in Ukrainian ports or waters. These were the first attacks on merchant ships since November 2023 and they could threaten 1% of the world's dry bulk exports if safety is not improved. The price of war risk insurance has already increased but the impact on exported volumes has so far been limited," says Gouveia.

Throughout 2024 Ukraine has been

exporting dry bulk cargoes from its ports in greater Odesa via a corridor close to its coast. The corridor has replaced a UN brokered agreement allowing the export of grains and other food products, which ended in July 2023.

During the first ten months of 2024, dry bulk shipments out of Ukraine were three times higher than a year earlier. The new corridor has allowed for an increase in grain shipments and for shipments of iron ore to resume. Despite the improvement, shipments are still 27% lower than pre-war

The coastal corridor has been crucial in ensuring low global food prices. It has supported a 15% year-on-year decrease in the FAO cereal price index so far in 2024. Ukraine is a large grain exporter accounting for 7% of global seaborne grain exports. It is also the fourth largest maize exporter, and its wheat exports are significant.

"If Ukraine's seaborne exports were disrupted again, as they were during the start of the war, it would not only affect food prices, but also the dry bulk market. While the world's reliance on Ukrainian grains has decreased, replacing its volumes would still be challenging. There are only three large maize exporters globally and the global wheat supply is strained," says

The Panamax and Handysize ship

Steelpaint's Polyurethane Zincing



'ALFRED OLDENDORFF' - SP-POLYURETHANE-ZINCING

New Building 2015

Jiangsu New Yangzijiang Shipbuilding Co. Ltd., Jingjiang, China.

After HP-jetting the cargo hold bulkheads only 10% of the total areas had to be recoated. 90% were in perfect condition after 9.5 years of operation and did not require any treatment.

TANK TOPS

Approximately 70% of the zinc surface was still in very good condition and was still providing cathodic protection of the whole surface. After a high-pressure wash, the tank tops were recoated to prevent pit corrosion.

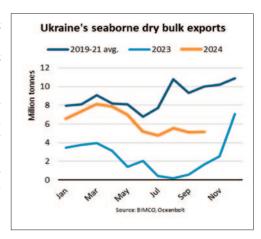
CONCLUSION

Only after 9.5 years were repairs required. Considerable savings in maintenance costs.

segments transport two thirds of Ukrainian cargoes and as such would be most affected by disruptions. Handysize ships mainly transport cargo to ports in the Mediterranean, while Panamax ships are preferred for shipments to Asia. Most Ukrainian cargoes transported by Panamax, Handysize and Supramax ships are grains.

Capesize ships would be negatively affected by any disruption, but to a lesser extent. They mainly transport iron ore which could easily be replaced by Australia or Brazil. Nonetheless, they could see a small decrease in demand due to shorter sailing distances to China.

"Regardless of the safety conditions for merchant ships, Ukraine's dry bulk exports will likely fall in 2025. The ongoing maize harvest is expected to lead to a 19% year-on-year decrease in yields, weakening exports. This will contribute to an expected stagnation in global grain shipments in 2025," says Gouveia.



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NETHERLANDS



New loss prevention tool helps ships navigate heavy weather

Extreme weather incidents are increasing across the globe and the impact on cargo ships is evident. Maritime insurance specialist The Swedish Club reports that it registered claims exceeding US\$25 million attributable to heavy weather over the past five years.

In response, The Swedish Club has developed a Heavy Weather Alert tool as an addition to its leading loss prevention tool Trade Enabling Loss Prevention (TELP).

Heavy weather can cause structural damage, shifted cargo, broken mooring lines, wet damage, lost cargo overboard, and more. The Club says it has also seen examples where vessels have failed to suspend cargo operations and depart port in a timely manner when severe weather is approaching, resulting in major losses and claims. This is despite the fact that most vessels today have access to high quality weather reporting and weather routing.

The Swedish Club's innovative Heavy Weather Alert provides timely loss prevention advice to insured vessels operating in proximity to severe weather patterns. Based on a vessel's position, in combination with up-to-date weather information and real-time data, the Heavy Weather Alert system automatically generates a customized loss prevention alert, with hands-on advice, when severe weather conditions are detected near a vessel's position — thereby helping to mitigate potential risks and ensuring the safety of both crew and cargo.

The service has been fully developed in-



house by The Swedish Club's Loss Prevention and IT departments, reflecting the Club's commitment to delivering cutting-edge solutions that support its members in navigating the complexities of maritime operations.

Peter Stålberg, Senior Technical Advisor, commented: "Over the past five years The Swedish Club has registered claims exceeding US\$25 five million attributable to heavy weather. Any measures we can take to reduce this figure will contribute positively towards our members' operations and insurance records."

The Swedish Club's TELP service combines latest technology with its years of claims experience and expertise, including information from external sources, to help vessels safely chart their way through high-risk areas around the globe. By tracking its insured vessels' AIS signals, the Club is able to identify vessels bound for an area of particular risk and

provide them with timely and tailored loss prevention advice relevant to that destination. TELP sends out the advice a few days prior to the vessel's arrival, or when severe weather is approaching, enabling the crew to plan.

In addition to navigational risks or weather patterns, TELP can advise shipowners and captains of problems with bunkers, pilots or towage, or known issues with unfounded claims or dubious charges etc. With many thousands of ports and waterways to navigate, often varying from voyage to voyage, it's not easy for a Master to be aware of all potential high-risk areas. TELP can issue a warning if any of these 'hotspots' could be encountered during what should be an uneventful journey.

Current TELP subscribers will be automatically enrolled in the Heavy Weather Alert service as it is rolled out, ensuring they benefit from this addition without any additional steps required.

Panamax bulk carrier transits of Panama Canal down by 35%

A new booking system introduced for ships transiting the New Panama Canal could potentially disadvantage bulk carriers, which are already suffering because of drought restrictions now in place in Latin America.

Last July was significant in that the Panama Canal Authority permitted just 18 vessel transits daily due to lower than expected rainfall. This compares to a maximum of 36 under optimum operating conditions. As a result, some bulk carriers are now being forced to either sail via the Suez Canal or even around the Cape of Good Hope to



access markets in China. This adds at least 13.5 days and sometimes as many as 17.5 days, compared to using the Panama Canal.

Bulk carriers suffer anyway, since the Canal gives preference to container ships, but in July, just 129 Panamax bulk vessels transited, which was down 35% compared to July 2022. The situation did improve in August, thanks to heavy rainfall boosting water levels in Lake Gatun just in time for the US grain harvest, which started in September.

Barry Cross

BERG Propulsion OpWind® to optimize operations for sail and engine combustion

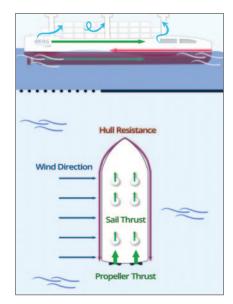
utomatic system monitors input from wind propulsion to ensure fuel savings are maximized by making most efficient use of propeller speed and blade angle

BERG Propulsion has unveiled the OpWind® software system to help crews combine the operation of sails and propellers in the most efficient way in all sea conditions.

OpWind automatically ensures that engine efficiency can be optimized with respect to propeller rpm and blade pitch angle when wind propulsion is also used to propel a vessel. The approach saves even more fuel than would otherwise be the case.

The system automatically senses any sail contribution to propulsion based on a vessel's operation data and measured parameters, continuously and automatically adjusting propeller pitch and speed to maximize the efficiency of the combined operation of propeller and sails.

The BERG Propulsion OpWind system has been developed from the Swedish company's existing Dynamic Drive technology to compare detailed theoretical information and calculations about



operating with propellers and sails against measured values on-board the vessel, said Chief Technology Officer Emil Cerdier.

"OpWind is a more advanced system than Dynamic Drive and can be implemented on any ocean-going vessel fitted with any type of sails to identify optimal operating actions," said Cerdier.

"Savings from reduced fuel consumption

will depend on the vessel configuration and its operating profile, as well as on how large the sails are, but they will be considerable," he added. "Efficiency gains will be available whether it is a newbuilding or retrofit project."

The system can be run in several modes with settings either to keep a desired maximum speed, maximum fuel consumption or a constant propeller thrust. It is also possible to use the propeller for onboard power generation while in sailing mode.

BERG can also provide a Marine Information Display to visualize performance as part of the system. A constant vessel speed setting will automatically reduce engine propulsion power when sails contribute to forward thrust. With a feathering propeller design it is also possible to shut down one or two main engines depending on vessel configuration, to further reduce fuel and maintenance costs.

BERG Propulsion has received an initial order for systems to be used in sail/engine combined operation from a major vessel operator.





NSU to install rotor sails to Valemax VLOC

NS United Kaiun Kaisha, Ltd. (NSU) and Vale International SA have reached an agreement to install rotor sails (H:35m x D:5m x 5 units) manufactured by Anemoi Marine Technologies Ltd. on 400,000dwt-type VLOC (very large ore carrier), NSU TUBARAO, which has been engaged in a long-term transportation contract between NSU and Vale since its delivery in September 2020. The installation of the rotor sails on the ship is scheduled around September 2025.

A rotor sail is a device to obtain propulsion by using the pressure difference generated around a cylinder by rotating a cylindrical sail installed on the deck. It is expected to reduce fuel consumption and ${\rm CO_2}$ emissions from the ship by approximately 6–12%

NSU has been actively working to make its vessels more efficient and reduce its greenhouse gas (GHG) emissions through the introduction of energy-saving devices such as rotor sails and by transitioning to ships powered by next-generation fuels.

Vale is committed to supporting the maritime industry in achieving the International Maritime Organization's (IMO) decarbonization targets. Aligned with the ambition of the Paris Agreement, Vale also has a target of a 15% reduction in scope 3 emissions by 2035, related to the value chain, of which shipping emissions are part, since the ships are not owned by the company. Focused on adopting and leveraging technologies and fleet modernization to reduce GHG emissions, Vale created the Ecoshipping program, a R&D initiative based on a strong partnership with shipowners. Since 2018, the company has been operating second-generation Valemaxes (capacity of 400,000 tonnes) and, since 2019, Guaibamaxes (capacity of 325,000 tonnes) these vessels are among the most efficient in the world. As part of the Ecoshipping programme, Vale developed innovative energyefficient projects, such as the rotor sails project, and a pioneering project to incorporate multi-fuel tanks on iron ore carriers.

Anemoi is a major provider of rotor sails to the shipping industry. Its energy-saving technology offers significant reductions in fuel consumption and lowers CO_2 , SO_X and NO_X emissions to deliver more efficient ships.

VESSEL DETAILS

Name:	NSU TUBARAO
Dimensions:	LOA 361.0m x
	beam 65m x depth 30.2m
	x draught 23.0 m
Deadweight:	399,717 metric tonnes

Gross tonnage:

197,453











From challenge to conquest: SMT Shipping's journey to a 25% productivity boost using the NemaX grab

Nemag's customer, SMT Shipping, has achieved significant transshipment advancements, particularly in West Africa on the TSV (transshipment vessel) *Conakry Pearl*. This region presents a unique challenge due to its shallow shores,

extending 10 to 20 metres in depth for up to ten miles. To be profitable, operators have to ship their cargoes using colossal ore carriers. These Capesize vessels can export up to 200,000 tonnes.

However, these fully loaded enormous

vessels, 18 metres in depth, cannot approach the shore. The traditional solutions, like constructing extensive jetties or dredging long channels, are economically unviable. This is where SMT Shipping's expertise comes into play.

The company owns and operates vessels with a unique combination of highloading capacities and shallow draughts. "This allows us to transport a significant amount of cargo from the terminal, usually located in a river in West Africa, to the open sea. We then use large cranes to transfer the cargo to Capesize vessels, also known as Newcastlemax bulk carriers. For rapid and voluminous transfers, a highly efficient grab is essential", explains Marc Smeets, Technical Project Manager at SMT Shipping.

With revenue calculated per tonne, the challenge is clear: "We need to optimize the continuous cargo transfer process to maximize our profit."

SMT stands for innovation and integrity globally, with a 1,700-strong global workforce and offices in Poland, Cyprus, the US, the UK, and the Netherlands. Smeets has been working with the company as a Technical Project Manager for six years, and he's now working on a transshipping project in Sierra Leone.

This global maritime group of companies is involved in the shipping and transshipment of dry bulk cargo. Over the years of expansion, it has entered into joint ventures, acquiring vessels to optimize its customers' cargo operations and adding new ships to its approximately 62-vessel fleet.

SMT has four service divisions:

- bulk carriers and general cargo carriers
- transshipment
- cement carriers
- multi-purpose carriers

"Martine, account manager at Nemag, already told us about the NemaX grab. So we returned to Nemag, where she shared a pretty promising presentation. We could also see and experience the NemaX in operation at a steel manufacturer in IJmuiden near Nemag. This live demonstration was very convenient and showed first-hand how satisfied everybody was. In addition, she calculated and presented data comparing the cycle times of various grabs, revealing that the NemaX showed a remarkable productivity improvement of 14% and 19% compared to the clamshell and scissors grabs with similar specifications. This gave us valuable insights into the performance difference and a clearer view of the total cost of ownership. These numbers also convinced the commercial manager to give this

Renowned for transporting dry bulk from all kinds of ore and grain to scrap and salt, SMT has built its reputation as a trusted tonnage provider and business partner in the dry bulk market. Its cargo clients include mines, raw material end-

investment a try."

users, traders, importers and exporters.

Originally, SMT's vessels in West Africa transferred bauxite. When the bauxite market collapsed, SMT was compelled to shift to iron ore transfer for a client in Sierra Leone. This transition posed challenges due to the differing specific gravities of bauxite and iron ore.

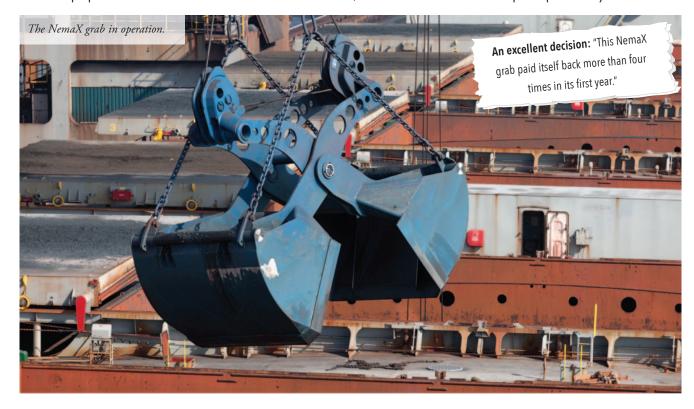
Bauxite is lighter than iron ore, respectively around 1.6 versus 2.5 tonnes per cubic metre. Therefore, each material asks for a unique type of grab that maximizes efficiency without compromising the safety and integrity of the crane system.

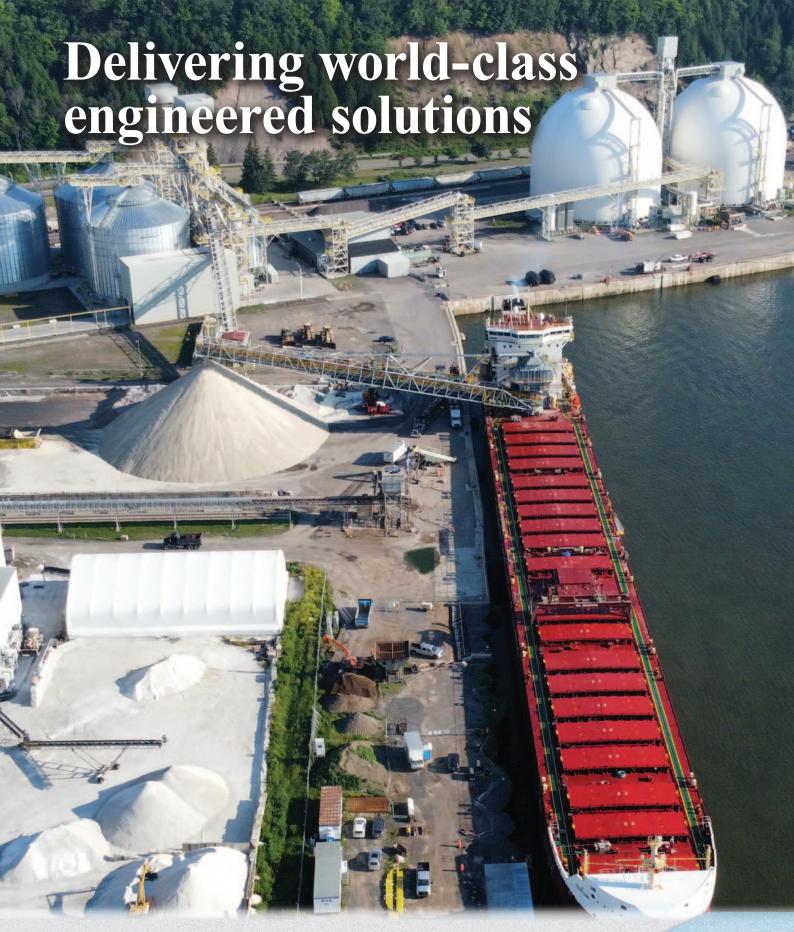
Although SMT purchased a specialized bauxite scissors grab from Nemag, the differing weight characteristics of iron ore presented issues with crane overloading, impacting the time of each unloading cycle — a vital factor in its revenue model calculated on a per-tonne basis.

THE CHALLENGE: THE SEARCH FOR THE OPTIMAL CRANE AND GRAB COMBINATION

Smeets explains that SMT now had three different grabs at its disposal. None of them was ideally suited for the specific characteristics of the iron ore they were now transferring. "We had one too-small clamshell grab, a too-big bauxite clamshell grab, and the big bauxite scissor grab from Nemag."

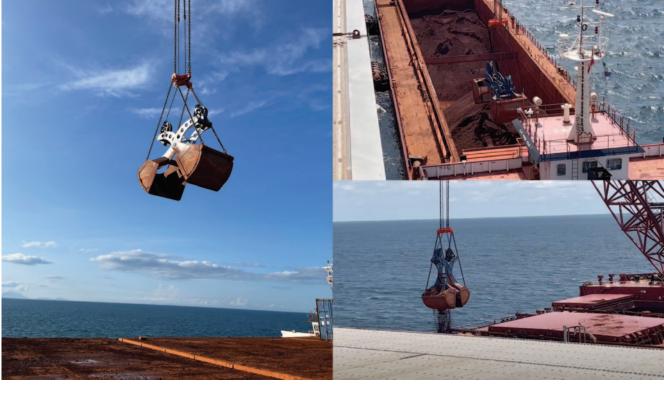
It sounds like a luxurious position to have three grabs available. "Our technical management wasn't so eager because we already had three expensive grabs on board. But I was fully convinced that we needed a new grab, since they all didn't enable optimal productivity".







Engineering
INTO
Productivity



THE SOLUTION: ENABLING A HIGHER EFFICIENCY RATE WITH THE NEMAX GRAB

Facing a challenge with its grab selection for iron ore transshipment, SMT Shipping began exploring the best possible grab solution.

The group had already experienced Nemag's craftsmanship with its scissors grab purchase. The NemaX grab stood out because of its efficiency. Traditional clamshell grabs require a significant amount of wire to be pulled in and out, taking valuable time with each cycle. In contrast, the NemaX grab uses a fraction of the wire length compared to standard grabs.

In the case of SMT's small clamshell grab, the wire length is 13 metres compared to the 8.7 metres of the NemaX grab. "Saving seconds on each cycle doesn't seem much until you calculate the impact on an annual basis."

Although the productivity looked promising, Smeets still had to convince his boss. "Our owner always thought Nemag was a bit like the Mercedes or Ferrari of grab builders — the highest quality but overpriced when you only need to get from A to B.

He later discovered that the price difference between Nemag and its major competitors wasn't significant. This ended his long-standing perception when he learned that Nemag's prices are reasonably in line with the market.

"High-skilled operators combined with the technical advantage of NemaX meant our overall efficiency would significantly improve. Recognizing the potential of the NemaX grab, as it is also co-developed with Delft University of Technology, we decided to invest in it."

On comparing its productivity with other grabs in the Sierra Leone use case, NemaX emerged superior due to its speed. Thus reaffirmed the notion: faster transfer times result in higher profits.

THE RESULTS: A 25% INCREASE IN PRODUCTIVITY, THREE MONTHS ROI AND EASIER MAINTENANCE

Following the integration of the NemaX grab into SMT Shipping's operations, the company witnessed a remarkable surge in productivity.

The crew had to get used to the new grab in the first weeks. However, after their first month, the handling rate went from I,000tph (tonnes per hour) to I,250tph. The NemaX Grab boosted productivity by 25% compared to the previous Nemag scissor grab, which wasn't optimally suited for iron ore.

The right grab for the right job in this continuous transshipment process was an excellent decision — despite the other three available grabs at the ship. The stark improvement in performance resulted in an exceptional return on investment period of less than three months.

Furthermore, the NemaX grab demonstrated superior safety and maintenance features. Breakdowns are annoying, tedious, and expensive if you're on a ship in West Africa. With fewer

moving parts than the traditional clamshell grab, Smeets experienced zero breakdowns after transferring 6mt (million tonnes) in the first year.

Maintenance also was more straightforward. Technicians needed to climb up to service a clamshell grab, but the NemaX's design allows for easy access from the ground. The grab eliminates the risks associated with working at heights, especially on a moving vessel at open sea. It wasn't just safer to conduct maintenance. Unlike a clamshell grab with eight sheaves and eight hinges, the NemaX grab only has two sheaves and one hinge. Fewer moving parts and easier access contribute to faster and more efficient maintenance processes.

So, in addition to the productivity increase, the grab is also safer, easier and faster to maintain.

FUTURE PLANS: THE NEXT STEPS

After seeing the success of the NemaX grab, SMT was eager to keep improving. If you continuously rotate a 180° cycle in the open sea, it results in some accidental sideways collisions now and then. The skilled crew of mainly Polish workers welded some modifications. These enhanced the grab's strength without any downtime of the grab leaving the vessel.

Another challenge for SMT is West Africa's seasonal climate. The wet season, stretching from May to October, alters the iron ore's properties and affects the grabs' penetration ability.

The rain in the wet season makes iron





ore a bit heavier but also more lubricant and thus easier to penetrate. In the dry season, the ore is harder to penetrate and requires a heavier grab for the best performance. However, a heavier grab designed for dry material underperforms in handling wet ore due to its extra weight. So consistent efficiency levels are a challenge to sustain and usually turn into a compromise.

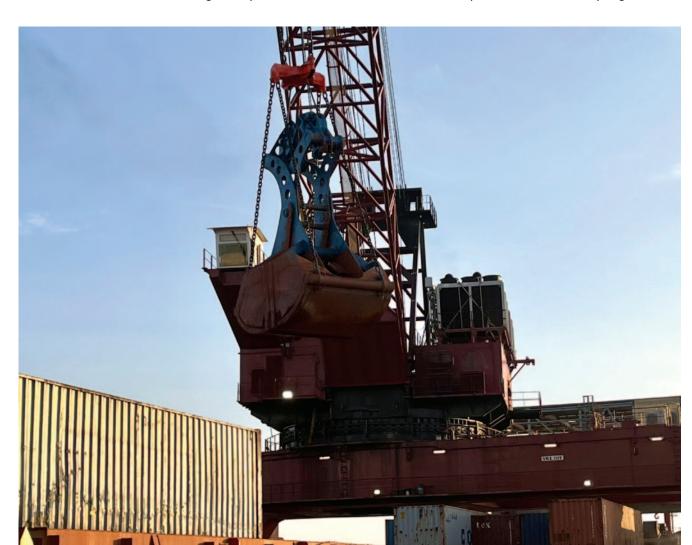
After the success of the NemaX grab,

Smeets was interested in buying another grab to further increase SMT's productivity. Open to innovation and custom improvements, Nemag also included the custom SMT adjustments in the new grab that is currently being delivered after a successful factory acceptance test.

Additionally, it has a unique feature to add or remove weight in the tubing of the grab. By changing its gravitational force, this hybrid solution can handle both wet and

dry ore well. The second grab allows for more flexibility and functions as a productivity insurance for when the current NemaX grab needs large or unforeseen maintenance.

To conclude, this approach strengthened the partnership between SMT Shipping and Nemag. But it also opened doors for future projects to tackle the unique challenges of open sea operations and ensure optimal performance and durability of grabs.





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Maritime Milestone: Royal Bodewes builds (and christens) cement carrier for Asian shipping company



The Asia Cement No. 9, a 7,828dwt self-discharging cement carrier from Royal Bodewes, was christened in Delfzijl on 9 April 2024.

It is a special ship with a unique story. The contact between the various parties started during the Covid-19 period. A period in which everything had to be done online and many things were just a little different than we were used to. Another interesting fact: the Dutch Royal Bodewes built this ship for the Taiwanese U-Ming Marine Transport Corporation. People often talk — rightly so — about (unfair) competition from Asian countries. The construction of this ship, for an Asian client, shows that the Dutch maritime manufacturing industry has the skills and knowledge to compete. Asian countries influence steel prices and have lower labor costs. As a result, it is rare for a ship to be built in the Netherlands for an Asian client. The ship that was christened in Delfzijl, was 100% built in the Netherlands. Although the ship was built at Bodewes, it is a collaborative project. "We received this assignment through a contact we already had. We have previously worked with the Swedish cement plant supplier Lovik. They put us in touch." This shows that networking and collaboration are important in all areas. "And not only important," says Carlijn Bodewes, "it is also

beautiful. It shows that together we can do more than alone. In fact, that we need each other. No one can do something like this alone, all suppliers and parties are needed." This is not just about cooperation with suppliers, for example. Carlijn explains: "The financial co-operation with Atradius (ECA) also played an important role in realizing the contract." This is something that the entire sector is currently working hard for. Co-operation contributes to strengthening the international positioning.

As described in the Sector Agenda, cooperation at national and European level is crucial for, among other things, the future sustainability of the Dutch Maritime Manufacturing Sector. The baptism in the harbour of Delfzijl was a party. There were a great many interested parties. example, the highest representative of Taipei Representative Office in the Netherlands, NMT director Roel de Graaf and cabinet envoy Kees van der Staaij were The official baptism was performed by Catharina Martens, after which a drinking dance was performed by the Kung Fu/Wushu association of Bao Trieu and Manlang Tang. This dragon dance was performed to appease the gods. A special detail is that it was the first time for Royal Bodewes to meet the delegation of the customer from Taiwan offline. "The contact started during the corona period. Everything went via Teams," explains Martijn Beunk. Although construction supervision has been present for a few months, this was the first time that Bodewes saw the people with whom the contracts were signed.

Soon after the christening in April this year, the Asia Cement No. 9 departed for Taiwan. Once there, the ship was deployed to sail along the coast full of cement cargo.

In the port, at the airport, or somewhere else: wherever cement is needed, this carrier will sail and unload very efficiently.

PARTICULAR DETAILS OF THE 'ASIA CEMENT NO. 9'

Build number:	778
Year built:	2024
Length over all:	114.99m
Length b.p.p.:	112.29m
Breadth mld.:	15.8m
Depth mld.:	10.7m
Design draught:	6.98m
Deadweight:	7,828 tonne
Tonnage:	5,305GT
Speed:	13.0 knots
Hold capacity:	286,000ft ³
Hybrid:	No
Ice Class:	No
Geared:	No
Breadth mld.: Depth mld.: Design draught: Deadweight: Tonnage: Speed: Hold capacity: Hybrid: Ice Class:	15.8m 10.7m 6.98m 7,828 tonne 5,305GT 13.0 knots 286,000ft ³ No



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Konecranes Gottwald ESP.9B Crane on Barge receives Lloyd's Certification for open-sea operation

The Generation 6 Konecranes Gottwald ESP.9B mobile harbour crane has received barge certification under the Lloyd's Register Code for Lifting Appliances in a Marine Environment. Konecranes has a 20-year history of using mobile harbour crane technology on water — from navigable rivers like the Mississippi to the demands of the open sea.

PROVEN HANDLING SOLUTION WITH STATE-OF-THE-ART TECHNOLOGY

The Lloyd's certification is another important step in the successful introduction of Generation 6, which combines the proven crane concept of previous generations with state-of-the-art technology and a new modular design. Built to handle wind speeds of up to 24 metres per second and maximum wave heights of 2.5 metres, the ESP.9B crane enables reliable bulk handling in tough sea conditions.

"For nearly two decades, Konecranes has offered customers a high-performance solution for bulk material transshipments on the open sea. Now we have brought this capability to the next generation too," explains Giuseppe Di Lisa, Vice President Sales & Marketing, Business Unit Mobile



Harbor Cranes at Konecranes.

"Like its predecessor, the ESP9.B crane on barge is designed for continuous bulk handling. It offers a maximum radius of 43 metres and a powerful grab curve of 63 tonnes. The technical achievements of Generation 6 make it future-proof in every respect. By placing the tower cab higher









up, we've again increased user-friendliness and view on the working area," says Di Lisa.

GRADUAL PRODUCT DEVELOPMENT THROUGH EXCHANGE WITH CUSTOMERS

With the new Generation 6 crane on barge, Konecranes is again responding to customer demands, as Di Lisa explains: "With a growing number of Konecranes Gottwald cranes on barge in operation around the world, we have continuously strengthened our leading position in this segment. It's thus always been our aim to offer customers a Lloyd's-certified Generation 6 crane on barge."

"Our technology has proven itself again and again on the open sea, even under We have now difficult conditions. combined this proven technology with new features that ensure our customers can benefit from high-performance and stateof-the-art equipment. The Lloyd's Register Code approval confirms the structured approach that our engineers have taken with the development of Generation 6," says Di Lisa.

The ESP9.B embodies two key principles Konecranes product of development: on the one hand, engineering focuses on the continuous, gradual development of mobile harbour crane technology. On the other hand — thanks to an ongoing exchange with customers the market's current and future needs are incorporated directly into new equipment.

MISSISSIPPI SUCCESS STORY CONTINUES ON THE OPEN SEA

The opening chapters of this success story were written on the Mississippi, where the number of Konecranes Gottwald cranes on barge grew rapidly.

"Our first crane on barge was developed as a result of an inquiry from an operator on the Mississippi. The customer wanted a crane that would bring the high performance of our mobile harbour crane technology from land to river. This was the beginning of a successful journey that we are now continuing with the Generation 6 cranes," explains Di Lisa.

In 2006, Konecranes' first Lloyd's certified crane for use on the open sea was put into operation. The crane had been ordered for handling coal exports off the coast of Indonesia. Due to its reliable performance, Konecranes soon delivered further cranes on barge to the Southeast-Asia region.

Another rapidly growing fleet of Konecranes Gottwald cranes on barge is in operation off the coast of Guinea in West Africa. Guinea has the world's largest reserves of bauxite, the key raw material in aluminum production. Bauxite mined inland is transported by riverboat to the coast, where meanwhile ten cranes load the ore onto sea-going vessels. As in Indonesia, the Konecranes equipment enables safe and fast handling to keep this global supply chain moving.

FLEXIBLE CONCEPT ENSURES SHORT **DELIVERY TIMES**

In addition to high performance, reliability and digital intelligence, Konecranes cranes on barge come with a modular design. This enables the cranes to be easily adapted to customer requirements and then delivered in comparable short time. This concept has again proven itself which is underlined by two orders that have been received for this crane type.

THE KONECRANES GOTTWALD ESP9.B AT A GLANCE

- maximum radius of 43 metres; powerful grab curve of 63 tonnes;
- bulk handling at wind speeds of up to 24 metres per second and maximum wave heights of 2.5 metres;
- flexible modular system; and
- comparably short delivery times.

Spliethoff expands fleet with L-type



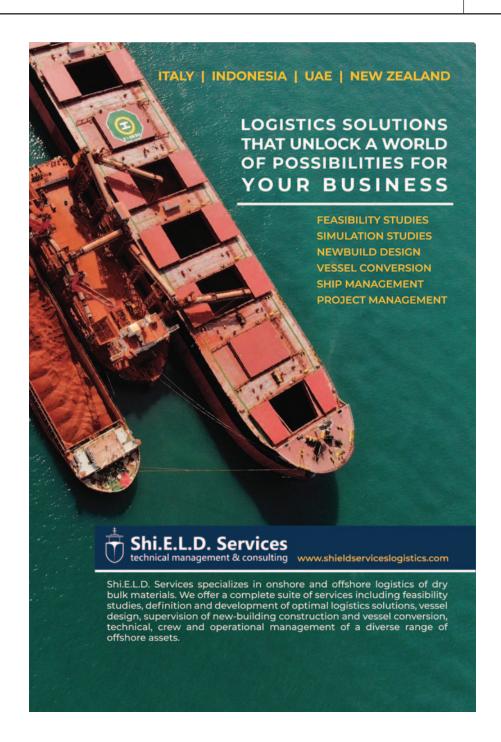
Spliethoff has recently announced that it has placed an order with Wuhu Shipyard Co. Ltd. in China for the construction of a new series of eight multi-purpose vessels with an option for two additional vessels. This new series will be delivered starting the first quarter of 2028.

The L-type vessels are specially designed for the transportation of various dry cargo types, including paper products, bulk cargo, project cargo and containers. These Finnish/Swedish IA Ice-Classed vessels will measure 203.25m in length, 28.25m in width, and will have a maximum draught of 10.5m. They will have a total capacity of about 33,700m³ and a deadweight of 28,600 tonnes, making them the largest vessels in the Spliethoff fleet.

The energy-efficient vessels are designed with slender hull lines and will be prepared for the use of future fuels. The vessels, with the bridge located at the front, will be equipped with five lifts (side loaders) and three cranes with a capacity of 150 tonnes each, combinable to 300 tonnes SWL. The deck of these vessels is large and free from obstructions, making it suitable for cargo with large dimensions.

Michael van den Heuvel, CCO: "We are convinced that we will have secured the excellent service to our clients for the future and look forward to welcoming these energy-efficient vessels into our fleet. We are proud of this step forward and believe that the L-type will play an important role in the sustainable future of our company."





Eureka Shipping announces construction of new cutting-edge cement carrier for Great Lakes trade



Eureka Shipping, a provider of sustainable, high-efficiency cement carrier services jointly owned by SMT Shipping and The CSL Group, announce the construction of a state-of-art mechanical/pneumatic cement ship destined for operation in the Great Lakes. The cutting-edge vessel with a deadweight of 12,500 metric tonnes, is designed to replace two older vessels, while maintaining the same cargo capacity.

"Building a ship aligned with ecofriendly principles is a top priority for both Eureka Shipping and our customer," said Kai Grotterud, Managing Director of Eureka Shipping. "Our new cement carrier is expected to contribute significantly to decarbonization by drastically reducing the emissions per metric tonne of cargo carried.

From its propulsion system to its onboard amenities, every aspect of the new vessel's design reflects a dedication to safety, environmental stewardship and operational efficiency. Key features include:

- a diesel-electric propulsion system consisting of four generator sets, providing redundancy for both navigation and cargo operation;
- modern, fuel-efficient engines capable of operating on HVO biofuel, to enhance performance and reduce emissions;
- two rudder propellers with 360 degree thrust, plus a powerful bowthruster, for superior manoeuvrability

and optimized navigation safety;

- energy-saving measures to minimize power consumption, including LED lighting throughout;
- state-of-the-art cargo handling equipment to reduce power usage during loading and unloading operations;
- extensive noise insulations and silencers on machinery and cargo handling equipment;
- prepared for operation on shore power when such power becomes available; and
- high-quality accommodations for officers and crew, prioritizing comfort and well-being.

The new vessel, currently under construction by the Holland Shipyard Group in the Netherlands, is scheduled for delivery in 2025 and will commence operations in the Great Lakes region.

In the interim, prior to the new vessel's arrival in Canada, *Sunnanvik*, a 8,600dwt mechanical/pneumatic cement carrier previously operating in Europe, is servicing its trade routes from April 2024. Equipped with modified discharge equipment tailored to the customer's receiving terminals, the vessel will discharge cargo at rates of up to 1,000 tonnes per hour.

As part of Eureka's commitment to decarbonization, *Sunnanvik* was fitted with two flexible, vertical 'Ventofoil' 'wing' sails from Econowind in 2023. These innovative

sails harness wind energy to provide additional thrust, contributing to lower emissions. Conditions permitting, they will be tested on the Great Lakes, enhancing the vessel's speed in favourable wind conditions.

Sunnanvik holds the distinction of being the first sail-equipped vessel to operate in the Great Lakes.

ABOUT EUREKA SHIPPING

Eureka Shipping Ltd. is a leading provider of logistical services within the specialized segment of pneumatic and mechanical cement carriers. Eureka owns and commercially operates a fleet of self-unloading cement carriers ranging in size from 3,000dwt to 23,000dwt in the Baltic Sea, the Atlantic Ocean, the Mediterranean Sea, the Caribbean and the Great Lakes.

The 12,500dwt vessel for the Great Lakes is the eighth newbuild cement vessel for Eureka Shipping since 2017, and the company is continuing its development with further fuel-efficient, low-emission vessels.

ABOUT SMT SHIPPING

SMT Shipping has, over the past 30 years, grown to a fleet of about 72 vessels through a number of joint venture companies operating in various bulk commodities markets, focusing on highly efficient geared bulk carriers, floating storage/transshipment terminals and belt-unloaders.

The UK's Port of Liverpool welcomes the UK's largest whole maize vessel

The Port of Liverpool, part of the Peel Ports Group, has welcomed the UK's largest shipment of feed maize, reinforcing its crucial role in supporting the nation's agricultural sector.

The bulk carrier, Lowlands Future, arrived from the East Coast of the United States, delivering 55,000 tonnes of maize. This record-breaking shipment is set to play a vital role in supplying animal feed to local farming communities, highlighting the port's importance in the UK's agricultural supply chain.

The importation was managed by ADM Agriculture, a global leader in animal nutrition. The maize will be stored in ADM's dedicated port-centric facilities at Liverpool before distribution to farms across the region.

Phil Hall, Mersey Port Director, Peel Ports Group said: "This shipment demonstrates our port's capability to efficiently handle large-scale imports crucial to the nation's food supply chain.

"Our partnership with ADM Agriculture and our state-of-the-art facilities have enabled us to process this volume, reinforcing Liverpool's position as a key gateway for agricultural commodities.

"Continued investment, such as our new £28 million dry bulk facility at Alexandra Dock, highlights our ongoing commitment to enhancing the services we provide to the agriculture supply chain."

Albert Linney, Senior Trader at ADM Agriculture said: "In a challenging year for UK domestic cereals with the UK wheat crop production around 25% lower vs the previous crop year, imported feed maize has featured very well into domestic rations across the Ruminant and



Teams from the Port of Liverpool and ADM Agriculture pictured at the recent arrival of the Lowlands Future.

Monogastric sectors.

"In light of such demand, ADM in partnership with Peel Ports have just undertaken the largest single discharge port execution for a feed maize vessel ever imported into the UK, with 55,000 metric tonnes on board *Lowlands Future* into the port of Liverpool.

"A special thank you to both the teams of Peel Ports Group and ADM for facilitating this shipment."

The successful delivery by Lowlands Future last month represents a significant boost to the agricultural sector, supporting food security and the supply of essential raw materials across the UK.

The Port of Liverpool continues to play a pivotal role in the import and distribution of agricultural products, reinforcing its position as a critical hub for international trade

ABOUT PEEL PORTS GROUP

Peel Ports Group is the UK's secondlargest port operator, owning and operating six of the UK's most important ports (Liverpool, Heysham, Manchester Ship Canal, Medway (Sheerness/Chatham), Clydeport and Great Yarmouth).

It also operates a container terminal in Dublin and owns BG Freight Line, which provides short sea container services between the UK, Ireland and mainland Europe and Peel Ports Logistics, one of the UK's leading shipping and freight forwarders.

Peel Ports handles approximately 70 million tonnes of cargo every year. Fourteen per cent of the total UK major ports traffic flows through ports operated by the Group.

Headquartered in Liverpool, it employs around 2,000 staff.



DCi

Ports of Indiana, Indiana State Department of Agriculture sign MOU to increase collaboration, agriculture trade and container shipping

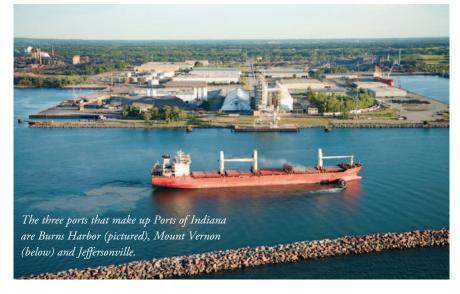
Ports of Indiana and the Indiana State Department of Agriculture (ISDA) have signed a Memorandum of Understanding (MOU) to increase collaboration, expand agricultural trade and create new container shipping opportunities for Indiana.

The primary purpose of the MOU is to establish a framework for enhanced collaboration, to promote increased agricultural trade, and to foster economic development for Indiana. The MOU outlines an agreement for the organizations to partner in the following ways:

- Encourage and support the expansion of agricultural exports through the state's port facilities.
- Investigate opportunities to develop new container shipping facilities that serve critical needs in the agriculture and hardwood industries.
- Connect key agricultural stakeholders with Indiana's ports to explore new shipping opportunities and convene critical stakeholder forums.
- Research container export opportunities related to ISDA's key priorities, including agricultural sand hardwood commodities.

"ISDA has helped position Indiana agriculture as a global leader in innovation and commercialization for food and fuel production, and our ports play a critical role in connecting our ag industry with world markets," said Jody Peacock, CEO for the Ports of Indiana. "Our organizations and industries are inextricably linked, and we have several shared objectives and opportunities for collaboration that can create future growth for our state and agricultural communities."

Earlier this year, the two organizations partnered with the Indiana Soybean Alliance and Indiana Corn Marketing Council to conduct a trade mission to



Indonesia and to host the first-ever Indiana Container Shipping Conference. Governor Eric Holcomb kicked off the conference as business, agriculture, and transportation leaders discussed ways to develop new container ports, grow agriculture exports and expand global trade to support Indiana's economic growth. In July, Ports of Indiana received federal approval to establish Indiana's first international sea cargo container terminal on Lake Michigan and signed an MOU with the Port of Antwerp-Bruges explore to agriculture and container opportunities.

"It's an exciting time for Indiana and I see a bright future for our ag industry in the global marketplace," said ISDA Director Don Lamb. "One of our shared goals is to make it as easy as possible for Indiana farmers and agribusinesses to market their products worldwide. By exploring opportunities to provide new container shipping facilities and better leveraging our ports, we're taking a major step forward in giving our growers a long-term

competitive advantage."

Agriculture contributes more than \$35.1 billion annually to the Hoosier economy, making Indiana the ninth largest agriculture state. Indiana ranks 13th in the nation for waterborne shipping, generating \$29.9 billion in annual economic impact. Ports of Indiana handles more than four million tonnes of agriculture products at its three ports on the Ohio River and Lake Michigan, and those cargoes make up more than a third of the total shipments.

ABOUT PORTS OF INDIANA

Ports of Indiana is a statewide port authority operating three ports on the Ohio River and Lake Michigan. Established in 1961, Ports of Indiana is a self-funded enterprise dedicated to growing Indiana's economy by developing and maintaining a world-class port system, and by serving as a statewide resource for maritime issues, international trade, and multimodal logistics.

ABOUT THE INDIANA STATE DEPARTMENT OF AGRICULTURE

ISDA was established as a state agency by the Legislature in 2005. ISDA reports to the Lt. Governor, who also serves as Indiana's Secretary of Agriculture and Rural Development. ISDA is also a member of the Governor's Cabinet. Major responsibilities include advocacy for Indiana agriculture at the local, state and federal managing soil conservation programmes, promoting economic development and agricultural innovation, serving as a regulatory ombudsman for agricultural businesses, and licensing grain firms throughout the state.



Business booming at Santos

In July, the Port of Santos, Brazil, posted a new monthly record for traffic, reporting a volume of 16.3mt (million tonnes). This was an increase of 6.9% compared to July 2023, when it handled 15.3mt. As for the year as a whole, traffic amounted to 105.5mt for the first seven months, equivalent to growth of 9.7%, which was also a record.

And it was agribulk traffic that led the charge, especially sugar and soybeans. In

January–July, the port handled 14.8mt of the former, up 43.1%, while the latter reached 26.2mt, albeit down 2% on the year, although up 18.4% in July.

Other commodities performed well too. Coffee bean shipments of 197,900 tonnes in July was a 49% hike over July 2023. The annual figure of 1.4mt represents growth of 60%.

Pulp increased by 35% in July, with 661,000 tonnes, and grew by 7.9% on the

year to 4.5mt.

Inbound fertilizer traffic performed well in July, rising 37.8% to 725.900 tonnes, although is down by 4% on the year at 4mt.

So, for the first seven months of 2024, dry bulk traffic at the port amounted to 54.7mt, up 3.6%.

In terms of commodities, soybeans accounted for 51.1% of the total, sugar 22.5%, pelleted soybeans 10.7%, fertilizer 7.2% and corn 2.6%.

Barry Cross

Bulk business rising in Brazil

According to figures released by ANTAQ, publicly owned ports in Brazil handled 43.22mt (million tonnes) in July, up 6.02%. Once privately owned ports are added, those figures rise to 118.96mt, up 1.38% compared to July 2023.

For the first seven months of the year, Brazilian ports handled a total of 764.7mt. Those commodities performing best were wheat (up 59.75%), sugar (up 22.18%) and fertilizer (up 18.55%).

Barry Cross

Bergé acquires second LHM 550 for Tarragona

In the Port of Tarragona, terminal operator Bergé has taken delivery of the second Liebherr LHM 550 mobile harbour crane. The first arrived in September.

This unit is more environmentally friendly than previous models, using 26% less fuel for the same work. It also emits less noise and has overall greater insulation.

It has an outreach of 54 metres and a maximum load capacity of 144 tonnes. It is therefore suitable to be deployed on dry bulk shipments, as well as on steel products and project cargo.

Bergé has also acquired the variant that incorporates the LiDAT Smart App Maintenance programme, which gives a real-time view of equipment status and performance to ensure that the machinery is in perfect condition, thereby cutting down time and increasing availability.

Barry Cross









PORT AGENCY STEVEDORING TRANSPORT CHARTERING SEATOWAGE BULK CARGO CREWING









DCi

New grain terminal at DP World's Port in Santos boosts Brazil's export capacity

As one of the world's top agricultural exporters, Brazil is reinforcing its position in the global grain market with the development of a dedicated grain terminal at the country's largest and busiest port — Santos, writes Fabio Siccherino, CEO of DP World Santos.

The terminal promises to boost Brazil's export capacity by 12.5mt (million tonnes) a year, strengthening the nations role as a leading supplier of soybeans, maize and fertilizers.

Recognizing the potential of this strategic location, DP World signed an agreement with Rumo, Brazil's leading railway operator, in March this year to develop this cutting-edge facility. Designed to handle 9mt of grains and 3.5mt of fertilizers each year, the terminal will significantly enhance Brazil's ability to meet growing global demand while streamlining the handling and transport of key commodities.

This collaboration marks DP World's fourth round of investment in Santos since it began operations in 2013, further solidifying its position as Brazil's leading multipurpose port operator — handling containers, cellulose, and soon, grains and fertilizers.

POWERING GLOBAL GRAIN SUPPLIES

Brazil's agricultural strength is undeniable. The country accounts for nearly 43% of global soybean and maize exports, making it a critical supplier to nations such as China, India, Egypt, and the European Union. These regions represent 46% of global grain imports, underscoring Brazil's essential role in feeding the world.

Between 2021 and 2023, Brazil's grain exports surged from 102mt to 151mt. This remarkable growth contrasts with declines in exports from other countries, highlighting Brazil's expanding influence in



the global grain market. The trend is expected to continue, with the Brazilian Ministry of Agriculture forecasting a 24.1% rise in production over the next decade, bringing total output to nearly 390mt by the 2032/2033 crop season.

ADVANCED INFRASTRUCTURE FOR GLOBAL TRADE

Under the 30-year agreement with Rumo, DP World will provide the terminal area on the left bank of Port of Santos and manage its operations and port services.

The terminal will feature two berths designed to accommodate Capesize and Panamax vessels, along with two ship loaders for grains and an unloader for fertilizers, ensuring efficient loading and unloading operations.

Storage capacity will be substantial, with six grain silos holding up to 175,000 tonnes and a fertilizer warehouse capable of storing 70,000 tonnes in 12 bays. This setup facilitates seamless storage and transfers

The terminal's railway dispatch system is also optimized for efficiency, capable of loading two simultaneous wagons at 16 wagons per hour. With a railway hopper that can handle 3,000 tonnes per hour and accommodating 348 wagons per day. Road reception facilities include two tipping points and one direct discharge, handling 14 trucks per hour.

This sophisticated infrastructure not only boosts the port's throughput but also streamlines Brazil's grain and fertilizer export operations, enabling smoother

logistics from farms to international markets.

SECURING BRAZIL'S AGRICULTURAL FUTURE

The total investment for the construction is estimated at \$500 million, which will be financed through a combination of its own resources, loans, and potential strategic partnerships. As global demand for agricultural products continues to rise, Santos is poised to become a critical asset for Brazil and its international trade partners. The terminal's expanded capacity will help reduce supply chain bottlenecks, ensuring timely deliveries to key markets such as China, India, and Europe, where food security concerns are driving higher demand for grain imports.

This development is a strategic investment not only in Brazil's agricultural future but also in its broader economic growth. By improving export infrastructure at Santos, Brazil ensures it can keep pace with rising global demand while maintaining its competitive edge in the agricultural sector.

In addition, the terminal supports the country's environmental goals. By reducing inefficiencies in logistics and transportation, it helps lower the carbon footprint associated with getting Brazil's grains to market.

With the completion of the new grain terminal, DP World and Rumo will unlock the full potential of the Port of Santos. This positions Brazil as a major force in agricultural trade and its role as a reliable global supplier of essential food commodities.

As Brazil's agricultural production continues to expand, the new terminal will play a vital role in ensuring the country remains a top-tier global exporter, ready to meet the challenges of a growing global population and the rising demand for food security.

New eco-hopper for TMC

Terminal Marítima de Cartagena, which operates at the Spanish Mediterranean Port of Cartagena, has acquired a semi-ecological smart hopper to improve the unloading of dry bulk consignments. The hopper was built specifically for TMC by Herjimar for deployment at the terminal the operator has at Escombreras.

The unit, which was built in four months, cost €400,000, and incorporates specific integrated technological equipment that, by combining the action of specific filters for dust collection with a complementary highly watertight seal, prevents or greatly minimizes the emission of polluting particles when materials are unloaded into the hopper. The hopper effectively retains a large part of the volatile particles generated during unloading, avoiding clouds of dust and other harmful particles that would otherwise escape into the atmosphere.

Barry Cross

Belledune Port Authority and QSL solidify partnership with new 25-year agreement

The Belledune Port Authority and its logistics partner QSL are strengthening their strategic partnership with the signing of a new 25-year lease agreement that will help transform the Port into a green energy hub and enhance supply chain opportunities with

Partners since 1997, QSL and the Port of Belledune share a vision of innovation, infrastructure investment and sustainable growth. QSL is a key supply chain player in port terminal operations, stevedoring, marine services logistics and transport throughout North America.

"BPA and QSL have a great history of combining forces to improve and expand Port and materials handling infrastructure," says Robert Bellisle,

partnership is a powerful demonstration of how we can achieve long-term, sustainable development, a critical component of our business model."

President and CEO of QSL. "We are proud of our commitment to Belledune and look forward to the next phase of growth. This "We are very fortunate to be working

with a partner that shares our vision for sustainability in both operations and business development," says Denis Caron, President and CEO, Port of Belledune. We have grown together for nearly three decades and are looking toward the next horizon, building innovation and growth into our operations to secure a greener and more prosperous future for the port, our clients and our local communities."

The partners have recently completed a \$35 million terminal expansion project at Belledune, with support from the National Trade Corridor Fund and the Government of New Brunswick. This project expanded Terminals 3 and 4 to increase the footprint for QSL operations, laying the foundation for many more successful years of cargo handling. QSL and BPA continue to plan for growth and look forward to attracting more business with an increased QSL presence and a vision for efficiency improvement, GHG emission reduction and an overall drive for increased tonnage movement through Belledune.

Together with suppliers and project partners, QSL and BPA are also working to develop and grow green energy projects and expand renewable energy supply chains in Northern New Brunswick. These efforts have helped Belledune become Eastern Canada's largest supplier of renewable wood pellets to Europe and they are continuing efforts to green terminal operations as partners and members of Green Marine.

Through this transformation, the leaders of both organizations are committed to engaging with suppliers, community leaders and indigenous rights holders to ensure that concerns are understood and benefits are shared.



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ABP acquires land to fuel future growth

Associated British Ports (ABP) has acquired 21 acres of land on the western side of the Port of Immingham in an offmarket transaction.

The acquired land is strategically positioned with frontage to Humber Road and Rosper Road. It forms an important additional step the future expansion of the port estate owned by the UK's leading and largest ports group.

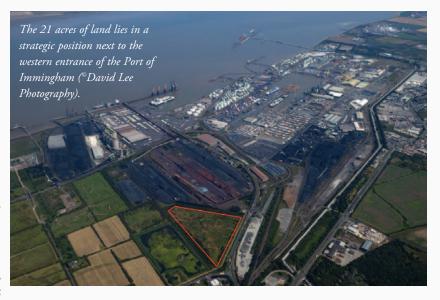
The land has a live hybrid outline planning application for up to 300,000ft² of new industrial buildings or 16 acres of industrial open storage uses. application is expected to be determined by North Lincolnshire Council planners soon. Andrew Dawes, Director of the Humber ports said: "Acquiring this strategic site on the western side of the Port of Immingham is integral to bolstering our footprint and ensuring the port — the UK's largest by tonnage — has room for growth to meet the demands of our customers on the Humber.

"It underpins our commitment to pursuing our ambitious mission to continuing to provide essential gateways to Keep Britain Trading. Immingham is at the heart of the UK's busiest trading gateway handling around 46mt (million tonnes) of cargo every year."

Greg Lacey, Head of Property said: "This is another strategically important land acquisition at the UK's largest port by tonnage, following the purchase of Stallingborough Interchange late last year. We are witnessing continued strong demand for warehousing to support traditional bulk cargos, as well as from industrial open storage requirements.

"The site's proximity to both Philips 66 and Prax is important, and we are considering how it could play into much broader energy projects for generation and storage — which is a key part of ABP's new mission to Enable the Energy Transition, and in this particular case, play our part in helping decarbonize the Humber".

ABP has a total portfolio of 8,600 acres across the UK, which includes over 2,400 acres of development land. The Humber property team can deliver commercial property solutions for businesses interested in prime industrial



and logistics opportunities. ABP welcomed over 150 new occupiers in 2023 bringing a total of 2,000 tenants across the estate.

ABOUT ABP HUMBER

ABP Humber Ports complex form the UK's busiest trading gateway. The four ports of Immingham, Grimsby, Goole, and Hull handle more than 58mt of cargo between them each year worth approximately £75 billion. Across the Humber, the ports support 34,900 jobs and contribute £2.5 billion to the UK economy.

ABP Humber's major investment programme ensures the ports offer state-of the-art cargo handling infrastructure and equipment, alongside a highly skilled team who can handle a vast array of cargo safely, efficiently, and sustainably.

It works collaboratively to build longterm partnerships and deliver the right supply chain solutions for customers, including value-added services and new facilities tailored to suit their business needs.

ABP Humber's Port Operations are complemented by its Pilotage Service and Vessel Traffic Service which ensure vessels are safely navigated through the Humber Estuary.

ABP Humber offers 364 hectares of development land across its port locations capable of attracting investment and delivering transformational benefits for the economy both locally and nationally.

The ports are all part of the new Humber Freeport, which offers three tax sites with an exceptionally business-friendly tax and regulatory environment for potential manufacturing investors.

ABP Humber supports its local communities. The ABP Humber Coastal Half Marathon and 10k is now in its 7th year and complements ABP's race sponsorship across the country.

Авоит АВР

Associated British Ports (ABP) is the UK's leading ports group, with 21 ports and other transport-related businesses, creating a unique national network capable of handling a vast array of cargo. It is driving growth, contributing £15 billion to the UK economy every year and supporting over 200,000 jobs.

ABP is redefining what Keeping Britain Trading means in the greener, cleaner economy. Its sustainability strategy, ABP Ready for Tomorrow, which sets out our plan to reach net zero greenhouse gas emissions from its own operations by 2040.

ABP IN NUMBERS:

- ~ 90mt of cargo handled each year;
- 4,000 hectares of port estate owned;
- 38% reduction in GHG emissions from 2014–2021;
- 18 out of 21 ports have renewable energy generation projects;
- > £55 million investment made in low emission and renewable energy generation technologies.

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Bruks Siwertell secures new ship-unloader order for major grain handler

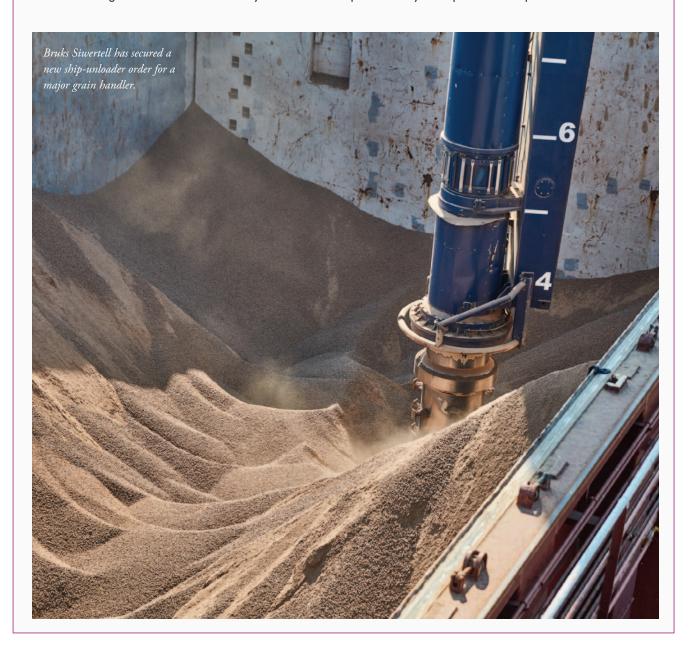
Bruks Siwertell has won a continuous screw-type ship unloader contract to support the operations of a major grain handler in the Philippines. The Siwertell ST 640 M-type ship unloader was ordered to deliver efficient, environment-friendly malt and grain handling in the Filipino port of Luzon.

"We have a number of Siwertell systems serving various dry bulk handling operations in the region, and our ship unloaders are especially well known for the unique advantages that they offer to grain handlers," says Ola Jeppsson, Sales Manager, Bruks Siwertell. "Operators know that they can rely on Siwertell technology to deliver the market's highest through-ship capacities, whilst ensuring that grains and agri-bulk are handled carefully, so that material degradation is minimal. This ensures shipment quality for sensitive cargoes like these.

"We are delighted to continue serving the grain handling sector, and with several new terminals planned in the Philippines, we are hopeful that many more operators will benefit from the unique capabilities of our ship-unloading equipment," he adds.

The new installation has been designed with the region's climate in mind. "This is a climatically challenging environment," Jeppsson explains. "Port equipment in the area has to be robust enough to withstand seasonal typhoons and earthquakes. Furthermore, this new ship-unloader will be installed on a particularly exposed jetty, and will be able to discharge vessels from both sides."

The screw-type Siwertell ship-unloading system will offer a continuous rated capacity of 800tph (tonnes per hour) for handling malt and other grains. It will be delivered fully assembled to the port via heavy-lift ship in the third-quarter of 2025.



Testing the value

The Fenner Dunlop laboratory, situated in its Drachten plant in the Netherlands, lies at the very heart of everything that the company does, writes Leslie David. Having established a reputation for quality and innovation over the past 100 years, the laboratory plays a pivotal

role in the quality control process and research & development. For example, every single batch of rubber compound has to be thoroughly tested and approved by the lab technicians before it is allowed to be used to produce conveyor belts. This is key to achieving consistency of quality and performance.

COMPARISON TESTING

Testing samples of belt made by its competitors is a routine part of the work carried out in the Fenner Dunlop lab. This kind of testing provides a factual, scientific insight that helps it keep ahead of it competitors. The company needs to know the strengths and advantages of its belts and how they compare to the competition. With cut-price imported belting from the Far East, primarily China, continuing to swamp the market, quality and value comparison is more important than ever. This is especially true in terms of whole life cost, those who believe

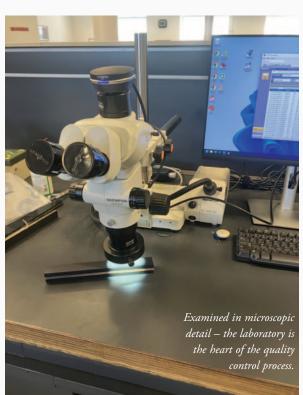
> that they are saving money are almost invariably

paying a much higher price than they realize, as these brief summaries of recently tested imported belts confirm:

Far East import EP 800/4 7 + 2 DIN W Abrasion resistant: this belt was specified and supplied as a 630/4 but was actually an 800/4. Cover properties did NOT meet the claimed DIN W standard in terms of abrasion resistance, tensile strength and tear strength. DIN W is the highest standard for abrasion resistant belting but the tensile strength of the cover was actually below DIN Z, which is the lowest standard. The belt was NOT ozone resistant. The tested belt was significantly below Dunlop standards and not inadequate for purpose.

Far East import EP 1000/4 7 + 2 DIN W Abrasion resistant: this 1,000N/mm belt had an 800N/mm fabric carcass and consequently failed to meet its promised specification. The rubber covers were far below DIN W requirements and therefore failed to meet the claimed specification. The belt was NOT ozone resistant. The belt had clearly been supplied under false pretences and again unsuitable for the intended purpose.

Far East import 400/3 4+2 MOR Oil Resistant: the complete absence of resistance to oils and greases, full polyester carcass rather than the claimed polyester/nylon mix (EP) and an almost total absence of ozone resistance mean that this belt does not meet claimed expectations and was unfit for purpose.



LEARNING THE HARD WAY — CASE STUDY

A company in Germany thought that they could save some money by buying an EP 630/4 4 + 2 DIN Y abrasion resistant belt from a 'local' manufacturer that was 'cheaper' than the Fenner Dunlop belt they had been offered. Unfortunately for them, they discovered the hard way that there was a good reason for the big price difference. When several different performance issues quickly became apparent, they sent a sample of the 'economy' belt for laboratory testing. Here is a summary of the test findings:

* Belt properties: testing revealed that the fabric plies of the belt carcass were entirely polyester (EE) rather than the claimed







DCi

specification polyester/nylon mix (EP). The elongation was extremely low (0.62%), which causes serious compression in the carcass resulting in delamination between the fabric plies and carcass tears are likely to occur after only a limited time. Also, adhesion levels between the inner plies and between the carcass and the outer covers were below DIN/ISO minimum requirements. This is another serious cause of splice joint problems and also carcass delamination leading to the premature failure of the whole belt.

- ❖ Covers: cover properties were exceptionally bad with almost non-existent abrasion resistance (325Mm³) and not complying at all with the cover grade specification promised to the customer. Tensile strength, tear strength and elongation at break were also totally
 - inadequate, caused by using the minimum possible amount of polymers and using bulking fillers such as clay to reduce the cost of the rubber.
- ❖ Ozone resistance: the cover started to crack within only eight hours exposure of the total test time of 96 hours exposure static ozone resistance testing (EN ISO 1431/1 procedure B). This is a very poor performance and will result in premature cracking of the covers and loss of physical properties when the belt is in use.
- Conclusion: the supplier in this case was a well-recognized trading/service company that claims to sell good quality products.
 The belt in question was almost certainly imported from the Far East and apart from the colour, did not comply at all with what the customer should reasonably have expected.

Fenner Dunlop Conveyor Belting tests competitor samples on a very regular basis. The company never uses its findings to 'name and shame' competitors, but is sharing these results to show readers what is going on in the world. End-users are not able to test the products themselves and rely on the honesty of the supplier of the belts. As can be seen in the examples above, which form only a small fraction of the numerous similar examples that Fenner Dunlop has, the quality and value of what is being supplied frequently differs enormously from what should be expected.





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Liebherr and ICO celebrate second LHM 550 at Antwerp XL

ICO's second LHM 550 will be used for handling containers and project cargo at ICO's terminal in Antwerp. The crane is currently scheduled to leave the factory in eight months. ICO has a successful history in lifting project cargo, previously using an LTM, and has experience with Liebherr cranes by renting them when needed. The choice for this model is driven by its enhanced lifting capacity and the excellent relationship with Liebherr, supported by the nearby Liebherr Belgium office and guaranteed high-level customer service.

Celebrating innovation and partnership at Antwerp XL. Liebherr and ICO are set to gather for a signing ceremony to commemorate the sale of the second LHM 550 to ICO. This event underscores the strong relationship between the two companies and their shared commitment to innovation in cargo handling. In Antwerp, ICO has been managing substantial volumes of out-of-gauge project cargo for years. However, its existing crane has become outdated both technically and in terms of capacity, as unit weights now often exceed 100 tonnes. Notably, about 75% of the cargo handled annually at the Antwerp terminal, amounting to 40,000 tonnes, consists of Liebherr cargo. This is a testament to modern and sustainable logistics, with Liebherr Colmar dispatching nearly all its overseas products by barge to the terminal, from where the cargo is distributed to various shipment berths.

AN INVESTMENT FOR THE FUTURE

"At ICO, we are constantly looking ahead to ensure we have the best equipment and technology to meet the evolving needs of our customers," says Alain Guillemyn, Managing Director at ICO Terminals. "The addition of the second Liebherr LHM 550 to our Antwerp terminal reflects our commitment to innovation and flexibility for all kinds of cargo projects. We aim to deliver efficiency and reliability across every operation, from traditional vehicle handling to complex project cargo. This investment further strengthens our position as a leader in sustainable, futureready logistics solutions."

Since its establishment in 2003, ICO has been a leader in the roll-on/roll-off cargo handling sector. At the end of 2021, it made a strategic decision to invest in a Liebherr LHM 550 mobile harbour crane for its Zeebrugge terminal. This move was driven by the need to diversify beyond their core business of car handling and to meet the growing customer demand for



increased RoRo shipment of project cargoes delivered by barge.

Three years on, it is clear that this was the right path to take. The first Liebherr LHM 550 handled 10,000 tonnes in its first year, 22,000 tonnes in the second, and a significant increase is anticipated in 2024. Today, ICO is pleased to announce the purchase of another LHM 550, this time for its Antwerp operations. The addition of the second LHM 550 not only boosts current operational efficiency but also prepares the company for future growth, enabling faster loading and unloading processes essential for maintaining a competitive edge.

In line with its commitment to sustainability, the organization is focused on reducing its carbon footprint through innovative technologies and practices. The two mobile harbour cranes play a crucial role in these efforts with their energyefficient e-drive systems, which significantly cut emissions during operations.

The signing ceremony at Antwerp XL is a reminder of the continuous journey towards improving port logistics. The partnership between ICO and Liebherr showcase ways in which innovative technologies and better cargo-handling help move the industry forward.

ABOUT INTERNATIONAL CAR OPERATOR NV

ICO Terminals is a global player in Rollon/Roll-off cargo handling and storage. Founded in 1984, the company's services not only include efficient loading and unloading of cars, construction equipment and breakbulk, but also extend to vehicle handling, ship agency and full handling of customs obligations.

ABOUT LIEBHERR-MCCTEC ROSTOCK GMBH

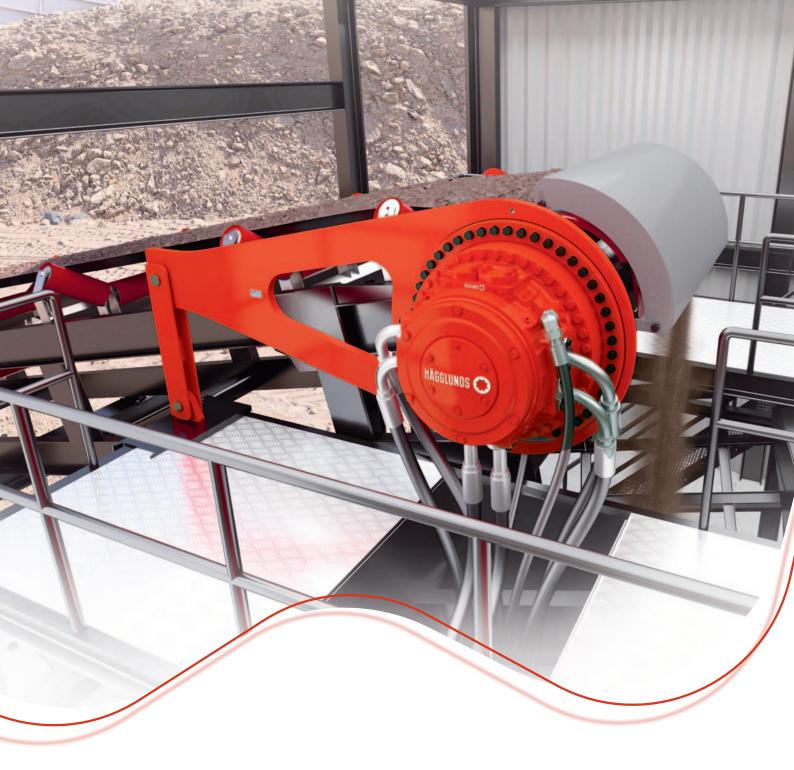
Liebherr-MCCtec Rostock GmbH is one of the leading European manufacturers of maritime handling solutions. The product range includes ship, mobile harbour and offshore cranes. Reach stackers and components for container cranes are also included in the product portfolio.

ABOUT THE LIEBHERR GROUP - 75 YEARS OF MOVING FORWARD

The Liebherr Group is a family-run technology company with a highly diversified product programme. company is one of the largest construction equipment manufacturers in the world. It also provides high-quality, user-oriented products and services in a wide range of other areas.



A signing ceremony was held at Antwerp XL on October 9 to commemorate the occasion. (f.l.t.r.: Philippe Collard, General Manager Operations at ICO Terminals; Pieter Vuylsteke, Director at Liebherr-Belgium; Henning Jaenisch, Sales Manager Mobile Harbour Cranes at Liebherr Rostock)



Bend the laws of size, strength and speed.

In mining and materials handling, the Hägglunds Quantum Power motor reshapes reality with shared DNA. Adding a slim new connection block to the proven Hägglunds Quantum, it opens up an unthinkable space – stretching to 170 rpm while retaining full torque capacity at high efficiency. For belt conveyors, crushers, sizers, surface miners and more, it's time to enter the Quantum domain: www.hagglunds.com/quantum



100 years of passion for performance at Nemag

GRIPPED BY INNOVATION

This year, Nemag, a renowned international expert in the design and construction of four-rope mechanical grabs and rope connection systems, celebrates its 100th anniversary. "Our drive to keep improving is deeply embedded in our DNA."

"Together with our customers, we strive to improve their bulk handling a little more each day." This is, in a nutshell, what sets Nemag apart, says Martine Dekker-Grootveld, co-owner and account manager Netherlands-based leading designer and manufacturer of the world's most efficient dry bulk grabs. "We always ask ourselves: how can we do better?"

This attitude is emblematic of Nemag, which is also known for its rope pear sockets and quick release links, providing the fastest and safest rope connection systems. The 100-year-old family business from Zierikzee, a town in Zeeland near the ports of Rotterdam and Antwerp, is recognized not only for its high-quality standards but also for its long-lasting customer relationships. "We continuously evaluate feedback customer experiences,"says Dekker-Grootveld. "This helps us better understand how to further improve the performance of our grabs." The importance of this cannot be overstated. "With the right grab, you can increase efficiency, becoming more productive at lower costs."



FROM IDEA TO PRACTICE

The drive to enhance performance is exemplified by the collaboration with SMT Shipping (see 'From challenge to conquest: SMT Shipping's journey to a 25% productivity boost using the NemaX grab' on p15 of this issue). It is also evident in partnerships with research institutions and universities. Long-term studies involving research and testing in both laboratories and the field have been providing valuable knowledge for Nemag's own products, as well as for existing and new customers. Ever more often, Nemag is regarded as a knowledge center, offering advice on streamlining logistics processes.

Niels de Vries, who graduated from the renowned Delft University of Technology with simulation models on the interaction between cranes and grabs, is proud of the mutual collaboration. "The lead time from idea to practice is really short here," he says. "We can quickly see the tangible result of creativity."

According to de Vries, this is because

the office and factory hall have traditionally been near to each other. In recent years, when a new ultra-modern office was built for Nemag, the architect ensured that the design encourages seamless collaboration between colleagues, fostering a strong team spirit. "Contact between office and production is very close," Dekker-Grootveld says, "so as a team, we can respond and adapt very quickly."

LOOKING AHEAD

Much has changed since Abraham Grootveld laid the foundation in 1924 for the international company that Nemag is today. Initially, he repaired everything from tools to stoves. Due to the proximity of the port of Rotterdam, more on he focused machine construction. While repairing grabs, 'Bram' noticed inefficiencies, so he started to tinker and see how grabs could offer a better balance between weight and grabbing capacity — work that he would continue to refine.

Since those early years, transportation has not stood still. However, Nemag's pursuit of continuous improvement in dry bulk handling remains unchanged. The team maintains close contact with terminals and crane builders worldwide to provide tailored solutions for their specific needs.

Says Dekker-Grootveld, a granddaughter of the founder: "Nemag has come a long way by always looking ahead. We feel an obligation to respond to new challenges in our field." Now, as the modern family business is led by the third generation, the focus is still on the future. "Our drive to keep improving," she knows, "is deeply embedded in our DNA."





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New Herjimar eco-hopper for TMC

Terminal Marítima de Cartagena, which operates at the Spanish Mediterranean Port of Cartagena, has acquired a semi-ecological smart hopper to improve the unloading of dry bulk consignments. The hopper was built specifically for TMC by Herjimar for deployment at the terminal the operator has at Escombreras.

The unit, which was built in four months, $cost \in 400,000$, and incorporates specific integrated technological equipment that, by combining the action of specific filters for dust collection with a complementary highly watertight seal, prevents or greatly minimizes the emission of polluting particles when materials are unloaded into the hopper. The hopper effectively retains a large part of the volatile particles generated during unloading, avoiding clouds of dust and other harmful particles that would otherwise escape into the atmosphere.

Barry Cross

Klasco receives powerful new E-Crane

Klasco, one of the largest stevedoring companies in the Baltic States, recently installed a brand-new E-Crane at one of its scrap terminals. This powerful crane, with a 42-metre reach and energy-efficient 450kW electromotor, is built to handle heavy loads like a pro.

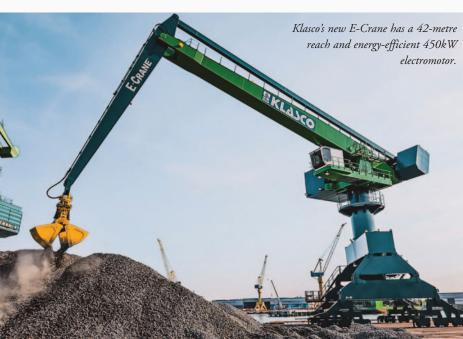
"Klasco was looking for a new crane at their scrap terminal in Klaipeda," explains Hans Kraaij, Area Sales Manager (Europe), E-Crane International Europe BV, "and they heard some positive feed back from other customers. They invited us to make an offer, and after visiting some clients in Europe, they were convinced the E-Crane was the best solution for them."

Klasco's decision to purchase



the I800C Series E-Crane was influenced by the E-Crane's TCO (total cost of ownership), reliability and the fact that the crane is easier to operate, compared to its rope cranes.

As the available power on the quay is 400V, the low energy consumption, due to the balance principle, is also a huge advantage. With its reliability and low energy consumption, the 1800C Series E-Crane is ready to take on the toughest jobs while keeping



costs down. Another win for Klasco and for smart, sustainable operations.

The new E-Crane will mainly be handling scrap, but other bulk material can also be handled, as E-Crane has also supplied a clamshell grab for heavy bulk material.

The order was placed in March 2023 and the E-Crane was operational in August 2024. Commenting on the installation, Kraaij said, "The complete process of installation went smoothly, also thanks to the cooperation of Klasco, and after training of the staff [operators and maintenance], the crane is now in full swing."

DCi

First LPS 600 in Germany



- The Liebherr portal slewing crane of type LPS 600, the first of its kind in Germany, is set to enhance bulk and general cargo operations at the port of Brake, which handles 1,924 ship calls and 7.1 million metric tonnes of a wide range of goods annually on the water side.
- J. MÜLLER Weser GmbH & Co. KG, founded in 1821, is renowned in Northern Germany for its provision of seaport logistics for agricultural, bulk and mass-produced goods.
- This project marks the first rail-mounted portal crane at the port of Brake, designed for an extended 650-metre travel path in one direction, with unique features like larger cable drum, video monitoring at the portal, and much more.

The LPS 600 features a 61-metre boom, a motorized grab control and an e-drive that ensures optimal handling performance. The

crane is designed for a total travel distance of 650 metres in one direction and therefore has an extra-large cable drum. A curve-going chassis with various pivot points has also been installed so that the crane can travel on winding roads and thus reach more areas of the harbour effectively. Special seals on the wheels have been installed as flood protection. The seaport of Brake is located 26 kilometres upstream from the Weser delta. It has modern transshipment facilities, silo facilities and warehouses along a 2.5-kilometre-long quay and a total of seven berths for large ships.

n order to remain ahead of its time, J. MÜLLER Weser GmbH & Co. KG has received the first LPS 600 in Germany, setting a new standard in cargo handling logistics at the port of Brake. The crane meets all the requirements for handling the wide range of bulk goods and dry bulk that

are handled in large quantities at the port of It is equipped with advanced functions such as an electric drive, a motorized grab and much more, and is designed to increase the efficiency of bulk and general cargo handling in the port. The use of a largely closed grab reduces emissions when handling dusty dry bulk such as grain and animal feed. Under ideal conditions, up to 1,000 tonnes of dry bulk can be handled per hour. The crane can also be used to efficiently handle unitized cargo such as pulp, timber, steel, wind turbines and project cargo. The crane's reach also allows direct ship-to-ship handling. These factors help to maintain and further expand the port's economic importance for the region.

THE NEXT CHAPTER IN OVER 200 YEARS OF PORT SERVICES

The LPS 600 is designed to meet the high,



specialized demands of bulk and dry bulk handling, offering reliable performance and increased productivity. The e-drive reduces ${\rm CO}_2$ emissions and energy costs, meeting J. MÜLLER's environmental and economic sustainability requirements. In addition, the new cab of the LPS 600 improves operator comfort and safety and reflects the company's commitment to social responsibility.

J. MÜLLER was founded in 1821 and has been family-owned ever since. The company operates its own seaport terminals in Brake and Bremen for the transshipment and seaport logistics of dry bulk and breakbulk of various sizes. The storage capacity in Brake is around 1.2 mt (million tonnes), including up to 600,000 tonnes of bulk goods in silos and warehouses and a further 600,000 tonnes of general cargo in covered and open storage areas. The company has the largest continuous silo facility in Europe and can unload 20,000 tonnes of agricultural goods every day.

"Our investment in the LPS 600 will

improve significantly our handling performance for dry bulk materials such as grain, feed, scrap, minerals, and for general cargo such as iron and steel, project cargo, wind turbines, wood, and pulp. The aim is to ensure smoother and more efficient operation and ultimately to increase throughput," says Jens Ripken, Managing Director of J. MÜLLER Weser GmbH. "We are confident that this crane will not only meet our current requirements, but will also support our future growth and expansion plans while meeting our sustainability goals. Liebherr's commitment to innovation and customer satisfaction is evident in every aspect of this project."

The LPS 600 is the first rail-mounted portal crane in the port of Brake. The crane's special features include an oversized cable drum and a curved chassis with various pivot points and special seals on the wheels, which ensure improved mobility and better flood protection.

Other special features include customized painting in the J. MÜLLER corporate design and video monitoring at

the portal, which is not part of the standard equipment.

LIEBHERR'S COMMITMENT TO INNOVATION AND SERVICE

The teams from both companies, including technical and operational experts as well as experienced crane operators, worked closely together to ensure that the crane meets the specific requirements of the seaport of Brake. The result of this successful collaboration is a crane that is not only the most powerful of its kind in Germany, but is also perfectly tailored to the needs of the port. "We are proud to deliver the LPS 600 to J. MÜLLER. This crane is an example of our commitment to innovation and customer satisfaction," says Eric Hein, Sales Manager at Liebherr Rostock.

From its early days to its current position as a leading company in maritime logistics, J. MÜLLER has always sought innovative ways forward. This latest expansion is another milestone on this journey and paves the way for future success.

ABOUT J. MÜLLER WESER GMBH & Co. KG

The J. MÜLLER group specializes in the operation of seaport terminals and associated port and shipping-related services. The regional focus is on northern Germany, in particular the Lower Weser region, where the group operates its own seaport terminals in Brake and Bremen. The medium-sized family business, now in its sixth generation, was founded in 1821 in Brake and has the largest connected silo facility in Europe at its location in Brake.

J. MÜLLER is a reliable partner for handling, storage and processing a wide range of agricultural goods. J. MÜLLER is also a leader on the German North Sea coast when it comes to general cargo. Whether it's pulp and sawn timber, iron and steel or even complete wind power and industrial plants.

With its state-of-the-art handling and storage facilities, extensive space and specialized equipment, J. MÜLLER is optimally equipped for the fast and efficient movement of all breakbulk goods. Spacious, multifunctional warehouses also

enable quayside storage that is close to the port and not dependent on the weather.

J. MÜLLER has its own fleet of inland waterway vessels and operates joint venture companies with renowned partners in the areas of truck logistics (B-LOG) and European inland waterway shipping (MÜLLER & Oorburg Logistics). The group's operating business is carried out by J.MÜLLER Weser GmbH & Co. KG. The company currently employs 554 people at its locations in Brake and Bremen, including 41 apprentices (as of June 2024).

Cargo handling and freighting services in 2023 at the Brake and Bremen locations:

- ♦ 6.3mt of general and bulk cargo; and
- annual turnover in 2023: approximately €150 million.

ABOUT LIEBHERR-MCCTEC ROSTOCK

Liebherr-MCCtec Rostock GmbH is a prominent European manufacturer of maritime handling solutions. The product range includes ship, mobile harbour and offshore cranes. Reach stackers and

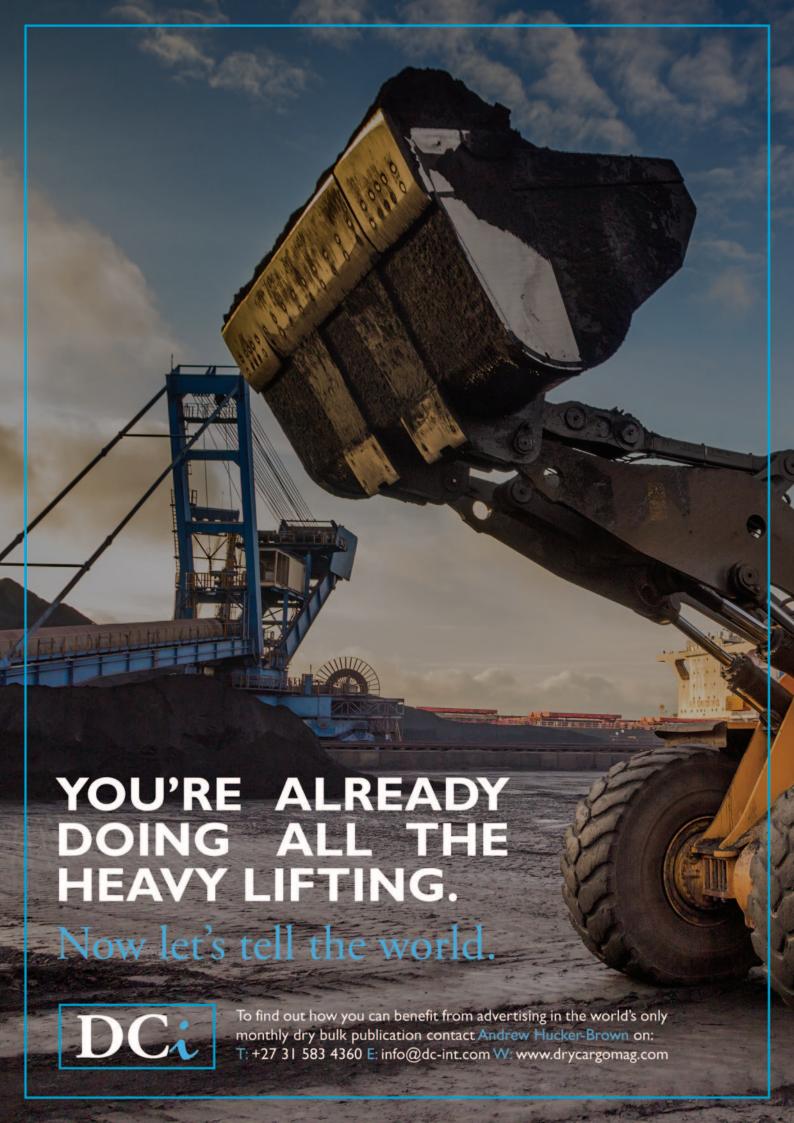
components for container cranes are also included in the product portfolio.

ABOUT THE LIEBHERR GROUP - 75 YEARS OF MOVING FORWARD

The Liebherr Group is a family-run technology company with a highly diversified product programme. The company is one of the largest construction equipment manufacturers in the world. It also provides high-quality, user-oriented products and services in a wide range of other areas.

The Liebherr Group includes over 150 companies across all continents. In 2023, it employed more than 50,000 staff and achieved combined revenues of over €14 billion. Liebherr was founded by Hans Liebherr in 1949 in the southern German town of Kirchdorf an der Iller. Since then, the employees have been pursuing the goal of achieving continuous technological innovation, and bringing high-quality solutions to its customers. Under the slogan '75 years of moving forward', the Group celebrates its 75th anniversary in 2024.





Keeping shipshape...



Vigan stays ahead of the game with constant innovation

As a prominent player in the bulk handling market, Vigan continues to innovate and provide high-performance equipment that meets the evolving needs of the industry. The company's commitment to excellence is reflected in its diverse range of products, ability to handle various commodities, and dedication to staying competitive through continuous improvement and technological advancements.

Vigan, based in Nivelles, Belgium, and a member of the VAN DE WIELE Group, specializes in the design and manufacture of advanced bulk handling equipment. The product lineup includes ship-unloaders, loaders, and mobile pneumatic conveyors. These systems are engineered for efficiency, reliability, and versatility, making

them ideal for a wide range of applications in the bulk handling sector.

Vigan's equipment is capable of handling a broad spectrum of bulk commodities. This includes grains, cereals, oilseeds, and other agricultural products. Additionally, the systems are designed to manage fertilizers, chemicals, and other dry bulk materials, ensuring that the diverse needs of clients are met.

Vigan serves a global clientele, including major agricultural co-operatives, port authorities, and industrial companies. The company's reputation for delivering high-quality, reliable equipment has made it a trusted partner in the bulk handling industry. With over 1,500 machines operating worldwide and more than 55

years of experience, Vigan's equipment can be found in numerous ports and terminals, enabling efficient transfer of bulk commodities from land to vessels and vice versa.

To maintain its competitive edge, Vigan heavily research development. The company focuses on enhancing the efficiency, safety, environmental sustainability equipment. Recent innovations include the use of advanced alloys for improved durability, smart electronics to reduce power consumption, and upgraded operator cabins for better ergonomics and visibility. This commitment to innovation ensures that Vigan remains at the forefront of the industry.



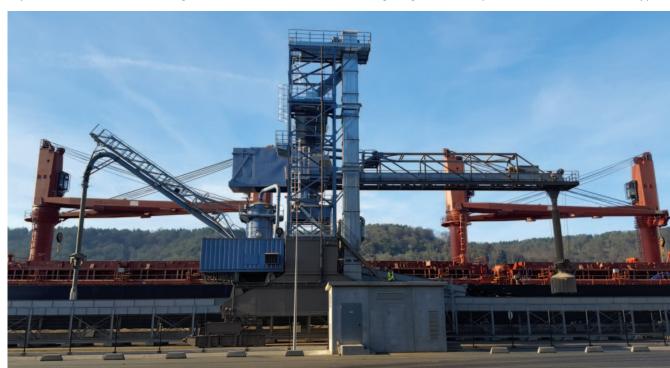
Vigan's shiploaders are renowned for their robust construction, advanced automation features, and high loading rates, allowing for swift and cost-effective cargo handling operations. These loaders are designed to handle up to 2,000 tonnes per hour for various products. The company offers a variety of technical solutions to accommodate different site configurations, vessel sizes, and operational requirements. Key features include dust management

systems, customized boom lengths, and various loading spout types to ensure efficient and dust-free loading operations.

Furthermore, Vigan focuses on providing tailored solutions to their clients. Instead of pushing a standard machine, Vigan works closely with customers to understand their specific requirements, ensuring that their equipment is customized to meet individual needs. This customer-centric approach has been instrumental in building long-term

relationships with clients and maintaining a competitive edge in the market.

Founded in the early 1960s, Vigan has grown into a globally recognized brand in the bulk loading industry. The company's headquarters and factory are located in Nivelles, Belgium, and it has a global presence with offices and service centres in key regions around the world. Vigan's team of experts is dedicated to providing exceptional customer service and support,





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Low noise & no dust emission

Turnkey solutions for cereals, soy flour, fertilizer, pellets and more...











ensuring optimal performance and satisfaction for clients.

The global grain industry faces several challenges, including climate change, geopolitical tensions, and rising energy costs. Vigan addresses these issues by designing equipment that minimizes energy consumption, ensures reliability and quick serviceability, and complies with stringent environmental regulations. The systems are equipped with advanced filters to maintain dust emissions below industry standards and are designed for ease of operation and maintenance.

The war in Ukraine has significantly impacted Vigan's operations, particularly in terms of market access and geopolitical risks. However, this situation has also opened up new opportunities in neighbouring countries around the Black Sea. By adapting its strategies to meet the needs of these emerging markets, Vigan has been able to maintain a presence in Eastern Europe and continue to support grain handling operations in these critical areas.

CONCLUSION

Vigan remains committed to providing innovative and reliable bulk handling solutions that meet the needs of its clients. The company's focus on research and development, combined dedication to customer service, ensures that it continues to lead the way in the bulk handling market. By focusing on research and development, tailoring solutions to customer needs, securing significant contracts, and embracing technological advancements, Vigan remains competitive in the market and continues to shape the future of bulk loading technologies.

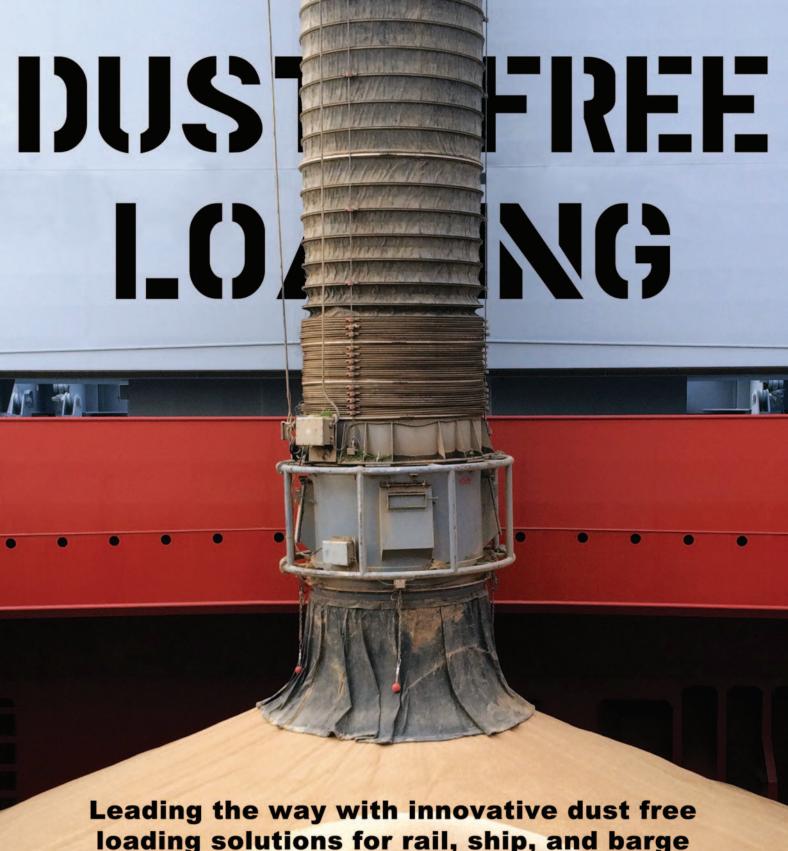


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DUST CONTROL AND LOADING SYSTEMS, INC.

Bulk cargo vessel loading with Mobile Conveying Services Pty Ltd

Bulk vessel loading plays a crucial role in global trade, enabling the efficient transfer of large quantities of cargo from land to sea. The use of specialized equipment, such as MCS mobile truck unloaders and conveyors, has revolutionized this process by significantly boosting productivity. Bulk conveyor systems allow loading rates of up to 1,000 tonnes per hour. This enhanced efficiency ensures that ports can maintain high throughput, critical for industries relying on timely exports.

Mobile Conveying Services Pty Ltd (MCS) is a private Australian company established in 2007 based in Brisbane and is at the forefront of the bulk materials handling industry providing specialized equipment, skilled labour and management to a wide range of customers. MCS has built its business around the supply of mobile conveying equipment and Telebelts, owning and operating a substantial fleet both domestically in Australia and to regions in the Pacific.

A variety of bulk cargoes have been handled using MCS mobile systems including iron ore, coal, silica sand, wood chips, wood pellets, fertilizers, grain and other minerals. These materials are vital to



Vessel loading operation (grain) with environmentally controlled covered dual lane truck unloader system and fully enclosed transfer and telestacker conveyors.

numerous sectors, and efficient handling systems ensure that they can reach international markets without delay.

MCS have supplied services to numerous customers including Rio Tinto, BlueScope, Hansons, Ballance, South32, Riordan Grain.

Vessel loading can consist of a comprehensive operational platform including mobile truck unloaders, transfer conveyors, and radial telestacker conveyors. These units allow for seamless co-ordination, leading to a highly productive and successful bulk vessel loading operation. The adaptability of MCS

equipment ensures that even in challenging environments, such as remote or narrow port berths, high-efficiency loading can be achieved.

Bulk vessel loading, supported by advanced conveyor systems, not only enhances operational capabilities but also provides cost-effective solutions for industries looking to streamline their export processes. By maximizing loading speeds and minimizing logistical bottlenecks, companies can remain competitive in the global market while ensuring reliable and timely delivery of essential bulk materials.



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Zone 1, 21, 2, 22

Cleveland Cascades: providing reliable, robust bulk loading solutions since 1992

INTRODUCTION

Cleveland Cascades Ltd located in Thornaby, UK, has been operating since 1992 and has developed the Cascade Chute System for over three decades. At present Cleveland Cascades has over recently reached its chute reference number 1,000 within 2024 sales.

The cascade chute is a specialist loading system designed to control the flow of bulk materials. This is achieved through mass flow, this is a single stream of material moving in high volume at very low velocity through the chute. Mass flow reduces the liberation of dust and the low velocity down the cascade virtually eliminates the movement of dust-laden air within the surrounding shroud. The shroud is fitted to the outer of the cascade chute and eliminates the adverse effects of side winds.

The cascade system is designed to control, limit and contain the dust created Soda ash loading system for installation on a railmounted shiploader in the

whilst loading bulk materials. Cleveland Cascades systems are also designed to protect product quality by minimizing product degradation through the promotion of mass material flow as described above.





Netherlands.

Bulk loading presents a major challenge in that material is often required to travel a significant distance from a conveyor system often at heights of 20 metres or more to the base of a vessel, storage silo or in smaller applications to a vehicle.

Factors such as material degradation, dust control, large volumetric requirements and clean material distribution are all considerations when designing systems to work effectively for bulk loading.

If material is degraded it may lose value or be no longer fit for use. If there are large amounts of dust created during

loading of a material there may be significant environmental impacts and associated penalties. Also, when considering the loading of bulk materials there must be a cost consideration in relation to the time and manpower involved in order to achieve the desired quantity of materials loaded.

SOLUTION(s)

The cascade solution overcomes these problems collectively. By directing the material flow through a series of inclined cones, this limits the flow velocity of the material to a controlled speed. The shape of the cone holds dry bulk in such a way that it prevents particle separation and minimizes material degradation.

The significantly reduced material velocity that creates a 'mass flow' effect as described above allows the material to flow onto a stockpile with minimized segregation.

Through the use of the cascade technology, dust generation can be practically eliminated at source without the requirement for high-cost, high-maintenance dust extraction systems. The Cascade systems have been proven to reduce dust emission levels to as little as 5mg/m³.

The requirement for bulk loading is both global and wide ranging in terms of the materials to be handled. Materials with bulk loading requirements the Cascade System has handled include; aggregates & building

products; alumina; bentonite; china clay and kaolin; cement products; solid fuels; fertilizers; grains and foodstuffs; iron and steel production materials; non-ferrous metal compounds; phosphates; potash; sulphates; sulphur; and urea and ammonia.

In order to load each of the materials effectively and in a timely manner, given the climate or specific application requirements, there are additions to the cascade systems that can be installed based on the particular needs.

RECENT PROJECTS WON IN 2024

${f S}{f O}{f D}{f A}$ ash loading system to be supplied to the ${f N}{f E}{f T}{f H}{f E}{f I}{f A}{f S}{f I}{f A}{f S}{f A}{f A}{f S}{f A}{f S}{f A}{f A}{A$

This loading system which is currently in production will be installed to a rail-mounted shiploader situated in the Netherlands.

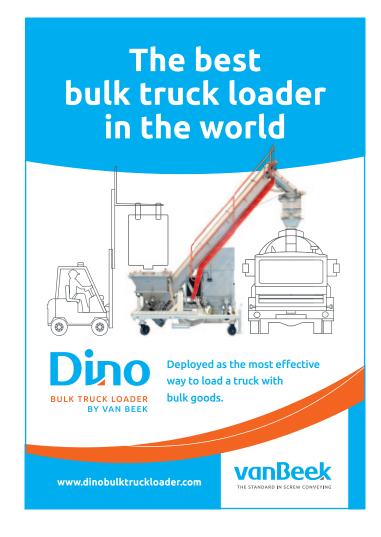
Measuring from the interface of the loading chute to the base of the skirted outlet, the system is capable of extending to 26m long. Utilizing the head chute-mounted winch hoist system, it is possible to achieve a retracted operational length of 6m; this can be further reduced to 5.7m when the system is non-operational.

Taking into account the required loading capacity, a 1300 sized system is specified which will allow for volumetric loading rates of up to $1,400 \, \text{m}^3/\text{hr}$.

The in-house manufactured GRP cones are lined with UHMW PE wear liners which have a low coefficient of friction allowing the bulk material to pass freely through the system. This aids in promoting mass flow, a stream of material moving as a single mass as product is delivered through the cones ensuring that fugitive dust emissions are kept to a minimum during loading operations.

Also included in the supply is a full suite of electrical components for system safety and automation which is to be integrated with the shiploader PLC control system.

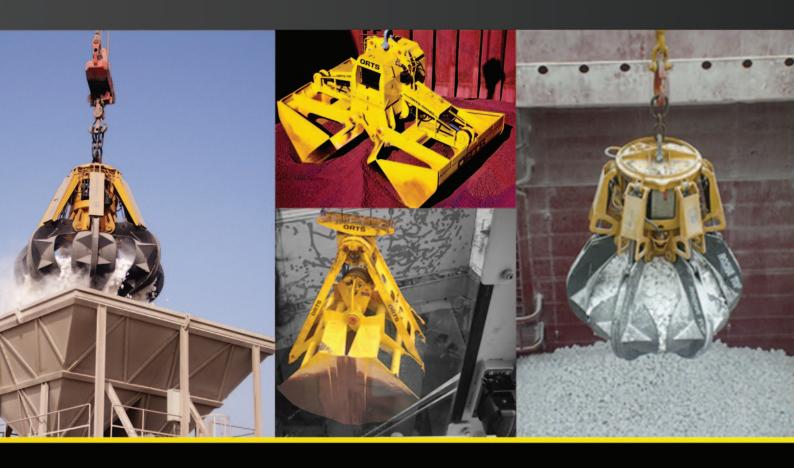


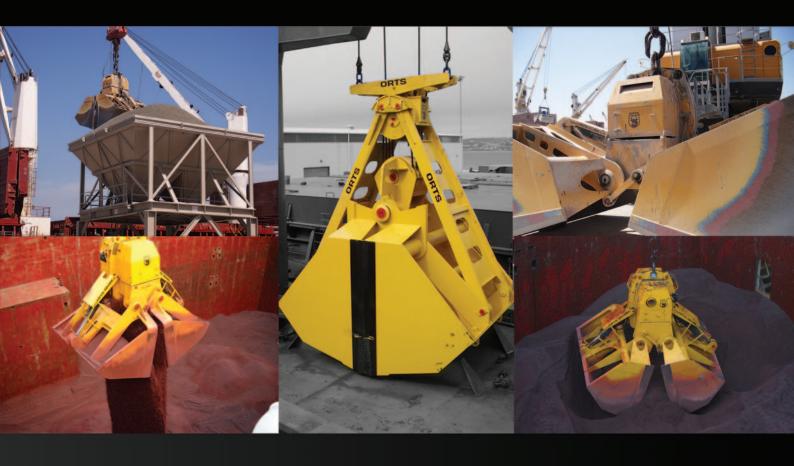






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Some rendered images of the finalized CAD model can be seen on p54.

FOUR IDENTICAL SYSTEMS TO BE SUPPLIED TO LOAD UREA INTO OPEN TRUCK VEHICLES IN NIGERIA

These systems will be designed to load granular urea at up to 220tph (tonnes per hour). These will be Cleveland Cascades' 650 sized system that will include the company's cones manufactured from stainless steel to handle the corrosive nature of the material.

The chutes will each be 5.16 metres at full extension suspended from a fixed head chute via chains for the steel cone arrangement. The retracted height is expected to be approximately 2.18m.

The steelwork will be painted to a marine specification for corrosion protection.

Each chute will be fitted with a skirt

outlet for dust suppression along with a suite of electrical components for safety automation including collision detection, load sensing, position and limit and well as material detection, all of which are linked with the shiploader PLC for control and automation.

TWO IDENTICAL ROAD LOADER SYSTEMS INSTALLED AT PORT OF TYNE, UK IN AUGUST 2024

Cleveland Cascades has supplied and installed two identical systems at the Port of Tyne, Newcastle UK.

These systems are for loading open truck loading for wood pellets and coal. These systems are designed to load at a speed of 500tph.

Both have been installed by works at the Port of Tyne, with support from Cleveland Cascades engineers.

The systems are 6.4 metres long from

interface to carrier outlet, and are suspended from a fixed head chute interface.

Each system is fitted with a locally mounted spool type hoist unit for extension and retraction. The systems each feature electrical components for safety and automation including: material detection; collision detection; and slack rope monitoring and upper identification. Since these systems are operating in a potentially explosive environment, the electrical components are ATEX rated for zone 20, 21, & 22 with a minimum IP65 ingress protection.

The head chute running faces are lined with Hardox and the cones lined with stainless steel for abrasion protection.

Each cascade is supplied with Cleveland Cascades' outer shroud and skirt outlet for dust suppression as standard.

NKTEHNOLOGIJA

custom engineering solutions







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Terminal Design

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Tilting Spreaders



Pelikan Jib Crane

BULK HANDLING EQUIPMENT

NK TEHNOLOGIJA

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GENMA shiploaders: flexible and efficient to easily meet multi-scenario

loading needs

Recently, RHM* successfully delivered a GENMA 1,000tph (tonnes per hour) shiploader. This unit was designed and built for an existing Indonesian client for use at its terminals. This shiploader is designed specifically for the transfer of palm shells and palm meal materials, injecting new vitality into the palm materials handling operations at the customer's terminals.

To achieve smooth and efficient material transportation, GENMA has carefully designed multiple key components, including a double tail truck, a shiploader relay belt conveyor system, an arm conveyor system, a chute device, and a throwing device. Among them, the GENMA shiploader chute device adopts a multi section sleeve form, with a telescopic distance of up to ten metres, which combines flexibility and adjustability, and can adapt to the efficient loading requirements of vessels varying in size from 8,000dwt to approximately 80,000dwt, at different tides.

In addition, GENMA engineers have also optimized the material throwing device and overall operation process of GENMA shiploaders to further improve loading efficiency.

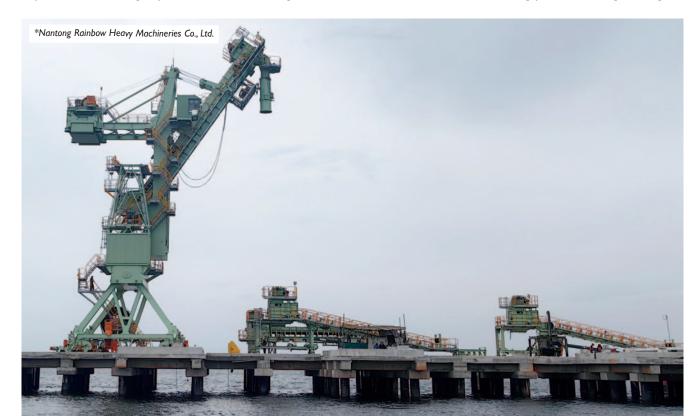
THROWING BELT DESIGN: IMPROVING LOADING EFFICIENCY

The throwing belt is one of the key components of the GENMA shiploader. It can be used to quickly and accurately drop materials from the unloading port of the shiploader to the target position. The



GENMA shiploader's throwing belt has been carefully designed and has the following functions:

Simplified workflow: traditional shiploaders are often limited by the feeding position and angle during the





Mobile Harbour Cranes ECO GREEN solution.

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loading process, resulting in a relatively narrow operating range. The material throwing device of GENMA shiploader adopts a short belt design with 360° full rotation, which means it can easily throw materials in all directions. This comprehensive feeding capability ensures that materials can evenly cover a larger operating range, avoiding situations where there is too much or too little material in certain areas.

Furthermore, this design also enables the shiploader to cope with various complex loading scenarios, whether it is a large open dock or a small, irregular loading area, it can flexibly adapt without the need for excessive manual adjustment or

- complex operations.
- Improving loading efficiency: the GENMA shiploader's throwing belt runs continuously at a rated speed of 15m/s, and can quickly and accurately deliver materials to the target position, ensuring fast loading of materials during transportation and further improving the overall operational efficiency of the equipment.

SIMULATION TECHNOLOGY AND OPTIMIZATION DESIGN: PRECISE CONTROL OF MATERIAL FLOW DIRECTION

In the product design process, GENMA product designers used simulation technology to accurately simulate and analyse the various components of the

shiploader. Through simulation and optimization of the design, GENMA shiploaders can achieve precise material flow control, ensuring efficient transportation of materials from the starting point to the loading compartment. This not only improves the production efficiency of loading operations, but also effectively reduces material waste, which can fully meet the needs of modern logistics industry for efficient operation.

The GENMA shiploader not only has the characteristics of flexibility, efficiency, stability, and precision in operation, but also has comprehensive functions, which can meet the loading and unloading needs of different sizes of bulk carriers and various types of bulk materials.



Merit Technologies India: wide product portfolio includes loading systems

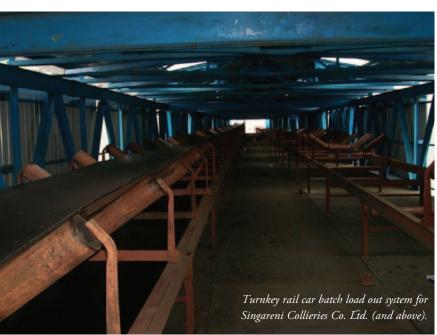


The Merit Group, established in 1997 is an ISO 9001: 2008-certified company. In India, it is renowned for batch load outs, rapid loading systems, in-motion rail cars and truck loading systems. The company headquarters and factories are located in Chennai, India.

Merit's products have gained a widespread reach and are exported to foreign countries such as Abu Dhabi, Bolivia, Canada, Indonesia, Kenya, Malawi, Mexico, Nepal, Nigeria, Sri Lanka, Tanzania, Uganda, and more.

The company now has the trust of many coal mining, power, EPC, port handling, railways, cement and oil refinery companies. These include, but are not limited to: Singareni Collieries; National Mineral Development Corporation (NMDC) Mahanadi Coal Fields; Bharat Coking Coal; Eastern Coal Fields; Northern Coal Fields; South Eastern Coal Fields; NTPC; Adani Enterprises; Reliance Industries; Heavy Engineering Corporation; Larsen & Toubro; Thyssenkrupp Industries; Sandvik Asia; Tecpro Systems; McNally Bharat Engineering Co, BTL EPC; Macmet Engineering Co; Isgec Heavy Engineering, IOCL; Nayara Energy; BPCL; MRPL; Bhilai Steel; ISW Steel; Walchand Nagar Industries; Sanghi Industries; ACC Cement; Dalmia Cement; Ultratech Cement Ltd; India Cements; Dheendayal Port Trust; East Coast Railway; and South Central Railway.

Examples of Merit's loading technologies include:



RAPID RAIL AND TRUCK LOADING SYSTEM

Description: turnkey rail car batch load out system — 2,400/3,600tph (tonnes per hour); approach conveyor gantry 1,200tph; steel silo & weigh hopper; civil & structural; hydraulic system; batch weighing; gates & loading chutes; and automation and control.

Customer: Singareni Collieries Co. Ltd. — Telangana — India

Location I: Ramakrishnapuram — two sets -Year — 2006

Location 2: Srirampur project — two sets — Year — 2007

Location 3: Ramagundam OC III — one

set — year 2007

Location 4: KCHP Manuguru — one set — year 2008

Location 5: Ramagundam — GDKI — one set — year 2009

Location 6: Goleti — Bellampalli — under execution.

TELESCOPIC LOADING CHUTE/SPOUT FOR TRUCK/WAGON LOADING

Description: Telescopic loading chute/ spout; heavy duty gates & control valves; dust extraction system; weigh bridge/batch weighing; automation and control.

Customers:

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Alstom — Maxico (A/C FLSmidth) — two sets — year 2001

Sanghi Cement — Bhuj-Gujarat — nine sets — year 2001

Sail — W.B (A/C FLSmidth) — eight sets — year 2010

Dalmiia Cement — Umrangsu — four sets — year 2014

Uganda (A/C Surendra Engg.) — two sets — year 2007

Nepal (A/C Chandrapur works) — two sets — year 2012

Sail (A/C Sapoorji Paloonji — eight sets — year 2012

OCL — Rajgangpur — Orissa — two sets — year 2008

TURNKEY CONTRACT FOR CONVEYING, STORAGE & TRAIN LOADING SYSTEM

Customer: Adani Enterprises Ltd. — Coal





& Mining — Gurgaon **Project:** Parsa — Silo I

Project: Reconstruction of damaged 4,000t RCC silo, supply of all the equipment of rapid loading system and its accessories

Description: RCC Silo — 4,000T (reconstruction); rapid train loading system — 4,000tph; includes pre weigh hopper and hydraulic system; batch weighing; gates & loading chutes; and civil, electrical, automation and control.

Completed: 2022

Customer: Adani Enterprises Ltd.
– Coal & Mining — Gurgaon
Project: Parsa — Silo III

Design, engineering, supply, erection and commissioning of reclaim chain conveyor, conveyor 4,000tph, extension of 4,000tph conveyor, 2,000t storage silo and rapid train loading system on EPC basis at Adani Parsa Kante — Chhattishgarh — India — Silo III Description: reclaim chain conveyor 1,250/1,375tph; 4,000/4,400tph, 145/105m length conveyor; extension 4,000/4,500tph long-distance conveyor, by 70m; steel silo & structural — 2,000t; rapid train loading system 4,000tph; includes pre weigh hopper and hydraulic system; batch weighing; gates & loading chutes; and civil, electrical, automation and control.

Status: under construction.

TURNKEY CONTRACT FOR CONVEYING, STORAGE & TRAIN LOADING SYSTEM

Customer: Isgec Heavy Engineering Ltd. — Noida

Project: design, engineering, manufacture, supply, erection and commissioning of storage silo and rapid train loading system at Kalinga port — Paradip — Orissa

Description: steel silo 875t; rapid train loading system — 4,000tph; includes pre weigh hopper and hydraulic system; batch weighing; gates & loading chutes; electrical, automation and control.

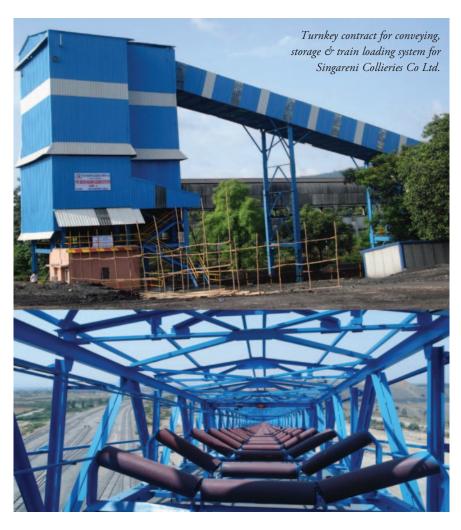
Completed: 2021

Customer: Adani Enterprises Ltd. — Coal & Mining — Gurgaon

Project: Parsa — Silo II: Design, Engineering, Manufacture, Supply, Erection and commissioning of Conveying, Storage silo and Rapid Train Loading system at Adani Parsa Kante — Chhattishgarh — India.

Description: reversible conveyor 4,000tph, length 45m includes conveyor gantry, structural, drive unit, pulley, idlers,

belting etc.; steel silo & structural — 2,000t; rapid train loading system — 4,000tph; includes pre weigh hopper and hydraulic system; batch weighing; gates &



loading chutes; electrical, automation and control.

Completed: 2021

TURNKEY CONTRACT FOR CONVEYING, STORAGE & TRUCK LOADING SYSTEM

Customer: APHMEL A/C Singareni Collieries Co Ltd.

Project: design, engineering, manufacture, supply, erection and commissioning of conveying, storage and rapid truck loading system at MNG OC, Manuguru area—Telangana — India.

Description: conveyor 1,200tph, length 110m, includes conveyor gantry, civil, structural and installation of drive unit, pulley, idlers, belting etc.; steel silo with civil & structural — 300t; pre weigh hopper; hydraulic system; batch weighing; gates & loading chutes; and electrical, automation and control.

Completed: 2019

TURNKEY CONTRACT FOR CONVEYING, STORAGE & TRAIN LOADING SYSTEM

Customer: Singareni Collieries Co Ltd.

Project: design, engineering, manufacture, supply, erection and commissioning of conveying, storage and rapid train loading system at Goleti Chp, Bellampelli Area — Telangana — India.

Description: conveyor 1,200tph, length 160m, includes conveyor gantry, civil, structural, drive unit, pulley, idlers, belting etc.; steel silo with civil & structural — 300t; rapid train loading system — 3,600tph; includes pre weigh hopper and hydraulic system; batch weighing; gates & loading chutes; electrical, automation and control.

Completed: 2018

TURNKEY CONTRACT FOR CONVEYING, STORAGE & TRUCK LOADING SYSTEM

Customer: APHMEL A/C Singareni Collieries Co Ltd.

Project: design, engineering, manufacture, supply, erection and commissioning of conveying, storage and rapid truck loading system at RKP OC, Mandamarri area — Telangana — India.

Description: conveyor 1,200tph, length 110m, includes conveyor gantry, civil, structural and installation of drive unit, pulley, idlers, belting etc.; steel silo with civil & structural — 120t; rapid truck loading system — 1,000tph; includes pre weigh hopper and hydraulic system; batch weighing; gates & loading chutes; electrical, automation and control.

Completed: 2017

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SAMMI's loading expertise along the whole bulk handling chain

SAMMI s.r.l. specializes in the design and manufacturing of machines for bulk materials handling, providing complete systems and solutions in different fields. Over its almost 50 years of history, SAMMI has expanded its action and production sectors, by increasing and improving its human, managerial and technical skills.

SAMMI believes that "No barriers exist, only new challenges". This philosophy leads the way the company does business. Over the years, SAMMI has always tried to extend its target market, offering new specific services and facing new markets. In the globalized world, high product quality alone is no longer sufficient. Being dynamic, open and ready for every new challenges and opportunities is fundamental to remaining competitive in the market.

SAMMI offers technologically advanced equipment, several application fields, flexibility to adapt itself to most demanding customers. These are the main elements of SAMMI's strategy for being competitive in the complex, selective and extremely demanding sector of bulk handling industry. The company's aims are to: design, build and innovate. SAMMI invests constantly to offer solutions that anticipate the needs of its customers.

SAMMI has strong expertise in loading



systems and ancillary equipment, and has shared some of its projects, which have included conveying technologies, from the last decade with *Dry Cargo International*.

SHIPLOADING

Year: 2022 Location: Gabon

Description: offshore material (manganese-bauxite-iron ore-coal) handling and shiploading system for transshipper *FTS Jeroboam* (1,500–2,500tph [tonnes per hour] conveyor system capacity)

Customer: Norden

Year: 2020

Location: Rijeka, Croatia

Description: petcoke handling, storage and port shiploading for the new DCU at INA's

refinery in Rijeka **Customer:** Tecnimont KT

Year: 2011

Location: Indonesia

Description: 2,500tph (coal) offshore belt conveyor system for transshipper *Bulk*

Sumatra

Customer: Coeclerici Group

Year: 2011

Location: Nantong, China

Description: offshore belt conveyor systems for transshipper *Bulk Borneo*, with a

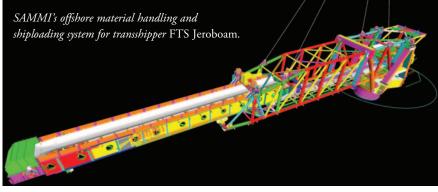
rated capacity of 2,000tph (coal) **Customer:** Coeclerici Group

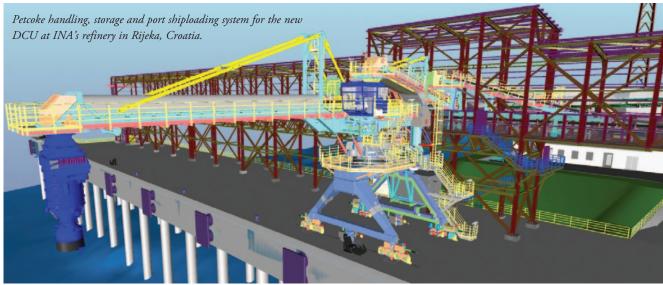
Year: 2010

Location: Nantong, China

Description: 2,000tph (coal) conveyor belt

system for transshipper Bulk Coal Customer: Coeclerici Group









Year: 2010

Location: Odessa, Ukraine

Description: 750tph offshore conveyor belt system for transshipper *Bulk Kremi* with continuous shiploader (crushed &

prilled sulphur handling) **Customer:** Coeclerici Group

Year: 2008 Location: China

Description: plant engineering for 2,000tph

transshipper *Bulk Coal* **Customer:** Coeclerici Group

Year: 2005

Location: Philippines, Indonesia

Description: fixed belts for 1,000tph

transshipper *Bulk Pioneer* **Customer:** Coeclerici Group

BIG-BAG LOADING

Year: 2018

Location: Le Palais-sur-Vienne, France **Description:** Big-Bag unloading system and material transfer to turbine dissolvers for table ware raw material (micronized

alumina)

Customer: Imerys Ceramics

Year: 2018

Location: Civita Castellana, Italy

Description: Big-Bag unloading system and material transfer to turbine dissolvers for sanitary ware raw material (kaolin, feldspar)

Customer: Imerys Ceramics

Year: 2015

Location: Gdansk, Poland

Description: petcoke handing, storage, reclaiming and truck loading system

Customer: Tecnimont KT

Year: 2007

Location: Brembilla (BG), Italy

Description: lime plant sifting and storage

line and vehicle loading **Customer:** Unicalce

BARGE LOADING

Year: 2014

Location: Tuen Mun, Hong Kong

Description: Radial stacker for muck/spoil removal storage on open area and barge

loading system

Customer: Marti Technics

SILO LOADING

Year: 2006

Location: Narni (TR), Italy

Description: sulphur silo loading plant line

modification

Customer: SGL Group

PLANT LOADING

Year: 2006

Location: Terni, Italy

Description: drying plant loading and

dosage system

Customer: ISRIM

Year: 2005

Location: Itri (LT), Italy

Description: lime loading plant on lorry,

rated capacity 80tph **Customer:** Unicalce

Year: 2004

Location: Terni, Italy

Description: biomass loading system to

energy plant

Customer: TECNOCENTRO eng. Srl

Year: 2002

Location: Rome, Italy

Description: sand loading plant on lorry

Customer: SOGECA Srl



Fast and efficient loading technologies from Loibl



Bulk handling equipment specialist Loibl offers conveyor systems as well as shiploading and unloading equipment for port handling. It provides efficient solutions that enable the smooth transportation of materials from the pier edge to the storage and point of use.

Loibl's high-performance loading and unloading equipment is specially developed for port handling. They can be used to transport large quantities of bulk goods quickly and safely. It also offers a wide range of conveying solutions that meet the individual requirements of each port. These include feed hoppers and hopper cars, chain conveyors, screw conveyors or belt conveyors that enable the continuous transfer of bulk goods over long distances.

Loibl's shiploading and unloading equipment enables fast and effective material transportation from the ship to the storage or point of use and vice versa. With state-of-the-art technology, Loibl can optimize the handling process to help increase the efficiency of bulk facilities.

Loibl's conveyors are robust and durable to withstand the demanding conditions of the port environment. The company also offers maintenance and support services to ensure that its equipment is always operating at its best.

FEED HOPPERS AND HOPPER CARS

Loibl offers all types of hopper cars. Whether mobile hoppers with their own drive, semi-mobile solutions coupled to another means of traction or stationary solutions, Loibl supplies customized hopper cars for every requirement. Its hopper cars are adapted to the bulk material, whether coarse or fine-grained, light or heavy. It can adapt the size and geometry of its charging and feed hoppers to all requirements and supply appropriate discharge technology.

Charging hoppers and hopper cars usually required for ship-unloading of bulk goods using an excavator or crane. They act as a link between an unloading device or excavator and the subsequent transportation solution for the bulk material. Belt, chain or pan conveyors are used as discharge devices.

Hopper cars can be equipped with additional solutions, including filter systems and dust retention systems or special mechanical constructions and other equipment.

SHIPLOADERS AND UNLOADERS

Every shiploader and unloader from Loibl is uniquely tailored according to the individual requirements. For conveying solutions, Loibl uses different mechanical

and pneumatic technologies which are suitably adapted to the local circumstances and products. The material handling is made as gentle as possible to prevent breakage and abrasion. This is how Loibl achieves best environmental conditions at maximum performance and optimal utilization of the available loading space.

Loibl provides systems which are suitable for the handling of dry and wet bulk materials. Depending on the requirements, its shiploaders and unloaders can be offered as stationary equipment or mobile on rails. They are ideal for the use under challenging climatic conditions. Besides the construction of loaders and unloaders, Loibl can also carry out the planning and manufacture of the steel structure, the electrical engineering, the control system and control rooms, the dust collection, the humidification and the rail construction.

The benefits of Loibl's shiploaders and unloaders include:

- modular design;
- low dust and low emission;
- good accessibility;
- easy operation;
- low noise conveying;
- construction acc. to ATEX Directives possible;

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Green grain handling: smarter, cleaner, and on-the-go

Polimak's mobile big bag filling machines are transforming grain logistics with an efficient and sustainable solution. These systems allow for direct filling of grains into big bags at the source, eliminating the need for additional infrastructure and significantly reducing transportation emissions. Their mobility facilitates flexible operations, cutting fuel consumption and supporting net-zero carbon emission goals. By integrating these machines, industries can streamline grain handling while contributing to sustainability and enhancing efficiency across the agricultural and bulk materials sectors.



WHAT MAKES THIS SYSTEM A GAME-CHANGER FOR GRAIN INDUSTRIES?

These systems operate by vacuuming grain materials into the machine, which are then passed through a jet cyclone to separate air from the grain, ensuring dust-free operation. The controlled transfer via a rotary valve allows seamless filling into large bags. The mobile unit's ability to function directly on-site, whether in fields or processing plants, minimizes the need for additional infrastructure, making it an efficient and sustainable solution.

The closed-loop design also prevents contamination, enhancing material safety and minimizing waste through precise handling. The ability to package grain directly in the field eliminates the need for multiple handling stages, reducing the



carbon footprint. Moreover, the efficiency of this system reduces overall energy consumption by streamlining packaging operations in a single mobile unit.

OPTIMIZED FOR GRAIN MATERIAL HANDLING

Maintaining product integrity is crucial when handling grains like wheat, corn, and barley. These machines are engineered to prevent contamination, moisture, and breakage, ensuring high-quality output. Their design reduces the risk of grain damage while protecting against external contaminants.

The system's mobility enables quick transitions between locations, allowing operators to fill multiple bags efficiently, minimizing downtime, and increasing

overall productivity.

A GAME-CHANGER FOR GRAIN HANDLING AND NET-ZERO GOALS

Polimak's mobile big bag filling machines offer great benefits, combining flexibility, efficiency, material integrity, and costeffectiveness. Their transportable design allows easy adaptation to various environments, from fieldwork to industrial settings. Equipped with advanced vacuum technology, these machines ensure rapid and consistent filling, significantly optimizing time and labour. Additionally, the closed-loop system protects grains from contamination, guaranteeing high-quality output. By minimizing the need for fixed infrastructure, Polimak's solutions also lead to substantial savings on equipment and

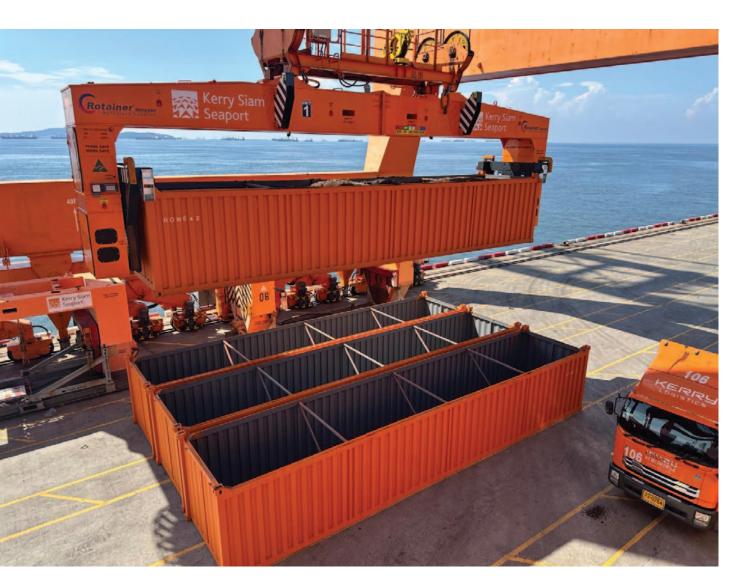
facility costs, making them an ultimate choice for efficient bulk handling.

In summary, Polimak's mobile big bag filling machines are redefining the grain handling industry. Their ability to efficiently fill large quantities of grain makes them indispensable for businesses looking to enhance productivity while maintaining quality. These machines align with net-zero targets by reducing energy use and carbon emissions. Their adaptability simplifies logistics, further supporting sustainable operations. As global demand for agricultural products grows, mobile big bag filling systems will become essential in modern grain logistics, ensuring that businesses remain competitive, efficient, and environmentally responsible. DCi



Making light of biomass cargoes

handling equipment under scrutiny



A picture is worth a thousand words – another success for CRS

Australian company Container Rotation Systems (CRS) is renowned for its container-emptying system, which offers an efficient solution to the problem of unloading bulk from containers.

This is a concept that is gaining in popularity worldwide, and is in use internationally handling cargoes of vastly different properties, from alumina to coal.

CRS offers a range of customized

solutions — among these are its rotatable containers, which work alongside the Rotainer® range to offer optimum emptying of dry bulk cargoes including: coal, zinc, copper, mineral sands, aluminium, iron ore, sugar and grains.

ASSEMBLY OF ROTAINER EUROSPEC MH4240-360 COMES TOGETHER ON-SITE IS LESS THAN ONE DAY

In mid-September this year, the CRS

engineering team supervised a highly skilled team in Thailand during the assembly of its latest innovative, patent-pending 40ft container rotator. The MH4240 is a 40ft container Rotainer fresh from CRS's cutting-edge Sydney manufacturing facility. This innovative addition to the company's Rotainer line-up reflects 15 years of expertise, delivering top-notch container rotation capabilities for ship-to-shore cranes. Tailored to manage large quantities

of low-cost goods from shore-based stockpiles, the MH4240 boasts a modular, single-beam design that underscores CRS's dedication to advancing containerized bulk handling technology.

CRS is proud of this installation as is another one of its Rotainers supplied with the company's innovative second generation electrics specifically mated to CRS's new 360° multidirectional drive system for super fast discharge — a swift, 15-second rotation is possible. The unit is designed to cater to the biomass, woodchip and waste industry where large volumes of very light materials need to be handled fast and efficiently. This 40ft container rotator is a beast.

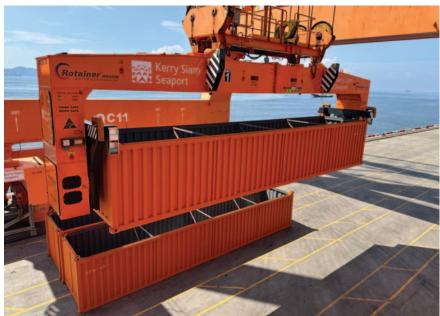
Further, this is another first for the containerized bulk handling industry as it will be fitted to a Sany STS crane. It ticks all the boxes, electric or diesel powered, as it fits reachstackers or STS cranes.

A picture is worth a thousand words and these pictures of the Rotainer Eurospec MH4240-360 during the installation and commissioning process clearly demonstrate the efficiency of the unit.

On the second day, the commissioning of CRS's latest addition to the Rotainer product portfolio was completed.

This innovative, patent pending 40ft container rotator turns heads — and containers. This latest model solidifies CRS's standing as pioneers in transforming container handling solutions worldwide.











Telestack were commissioned by their customer to design, build and install a TB 42 All Wheel Travel (AWT) high rise shiploader and x2 Titan dual-feed AWT 800-6 Bulk Reception feeder to load a range of commodities. The introduction of the AWT direct "truck to ship" shiploading system has transformed the flexibility and rapidity given to operators, not only in terms of speed (achieved by faster loading rates) but also the agility achieved through the ability to operate and move large scale shiploaders within the limited space on current jetty/docks.



Explosion protection by means of venting with Thorwesten Vent GmbH

USING PROPER VENTING TO PROTECT AGAINST EXPLOSIONS IN STORAGE

Every week there are various stories on social media, in print media etc. about explosions and fire incidents in storage facilities housing biomass cargoes, pellets, sawdust, coal etc, as well as in corresponding grinding systems. Whenever a dusty atmosphere is generated — and sufficient oxygen as well as an ignition source are present — the preconditions for an explosion are created.

In order to limit the consequences of an explosion to a manageable, controllable degree, reliable constructional explosion protection methods by means of explosion venting are required.

Today, state-of-the-art constructional explosion protection — e.g. in grinding systems as well as in alternative fuel processing and storage facilities — is regulated by international Rules and Directives.

However, as the grinding system is only one part of a very large equipment scope, less attention is paid to this issue during the overall decision-making process. When badly designed constructional explosion protection systems are used, this can lead to serious consequences such as a big explosion that can result in worker injuries or even fatalities.

In recent years, several severe explosions in grinding systems, as well as in the processed industry of alternative fuels, have emphasized the need for properly working constructional explosion protection. Therefore, corresponding rules and directives should be implemented in the technical specifications from the outset.

European ATEX Directives are helpful but their correct implementation isn't that easy. ATEX compliance has be enabled by installed technology but largely has to be organized by the operator of the systems.

EUROPEAN ATEX DIRECTIVES DIVIDED INTO:

- Directive 1999/92 EG relevant for operators covering the aspects of risk assessment, zoning, technical and organizational measures etc. pursuant the main target to the protection of health of workers acting in potentially hazardous areas:
- Directive 2014/34/EC relevant for manufacturers of explosion protection devices covering the requirements of autonomous protection systems, components, safety and control equipment. The significance of this



Directive is emphasized by the common requirements for equipment and protective systems. The part which is related to constructional explosion protection reads as follows: "Should an explosion occur possibly endangering persons directly or indirectly (or for that matter domestic animals or property), such explosion is to be halted immediately and/or the range of explosion flames and explosion pressures to be limited to a sufficient level of safety". Only ATEXapproved explosion venting devices assure a proper function as well as a correct determined venting area.

EN EUROPEAN/US AMERICAN STANDARDS

These standards are of great significance e.g. for grinding systems, storage facilities, etc. in terms of explosion resistant equipment (EN 14460), dust explosion venting protective systems (EN 14491), and explosion isolation systems (EN 15089). Corresponding American Standards issued by National Fire Protection Association are covered mainly referred to NFPA 68 as well as NFPA 69.

The danger of dust explosions is well known. Appropriate measures are usually taken and implemented to protect the systems and plant components. However, there are considerable deficits worldwide with regard to the safe operation of grinding plants, storage facilities, etc. The consequences of an explosion in such poorly protected plants range from massive damage to the plant to the loss of human life. The latter should be prevented at all costs. Operators of such plants should be

aware of their responsibility and act accordingly.

BIOMASS CARGOES IN FOCUS

The replacement of fossil fuels with alternative fuels is gaining more and more importance. The dangers associated with the explosiveness of such fuels are often underestimated or insufficiently known. Many of the alternative fuels used form a dust-laden explosive atmosphere. In the case of closed containers (silos) in which such fuels are stored, constructional explosion protection in the form of pressure relief is definitely required. In addition to the pressure relief devices, the correct design of the silo must be taken into account. In this context, the pressure shock resistance of the silo must be mentioned, which is a mandatory requirement. The pressure shock resistance of the silo should ideally be 2 bar g in accordance with DIN EN 14491. 2 bar g pressure shock resistance as an approved maximum value means that the pressure relief area to be installed is reduced to a minimum.

A static proof of the pressure shock resistance of the silo is required. With regard to the explosion characteristics (KSt/pmax) of alternative fuels, it should be noted that these are in some cases considerably higher than those of lignite. If available, reference should be made to characteristic values verified by tests. If no specific values are available, appropriate assumptions must be made.

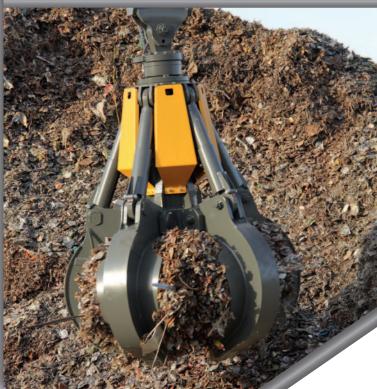
The storage of wood pellets is of particular importance in connection with the topic of constructive explosion protection by means of pressure relief. This primarily concerns closed storage facilities (silos) with a capacity of more than 100

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tonnes. The safe handling and storage of wood pellets from biogenic solid fuels in commercial and industrial applications is defined in the corresponding DIN EN ISO 20024. The above-mentioned DIN EN ISO has been developed over several years by a working group consisting of members from all over the world. As part of the risk assessment, it is made clear that wood pellets can generate an explosive atmosphere and thus trigger a dust explosion. The occurrence of such a dust explosion is illustrated by the explosion pentagon below.

With regard to explosion protection, clear measures for pressure relief are specified. In detail, the pressure relief openings must be closed. There are two reasons for this requirement:

- a) air ingress after pressure relief must be minimized; and
- b) loss of inert gas must be avoided.

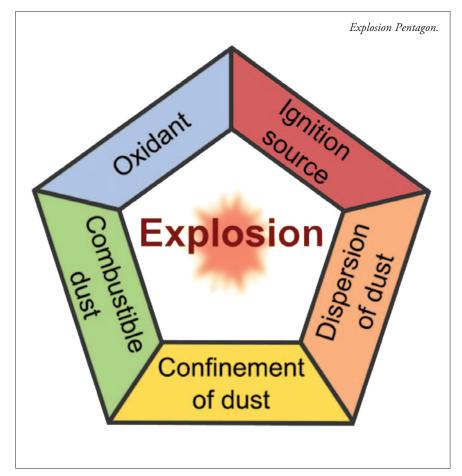
The venting area to be installed must be determined based on the pressure shock resistance of the silo, its corresponding volume and the explosion characteristics.

Past experience has often shown that the measures described are not used. It is therefore important to communicate the relevant DIN EN ISO. This article is intended to contribute to this.

CONSTRUCTIONAL EXPLOSION PROTECTION IN GRINDING PLANTS, STORAGE FACILITIES, ETC. HOW DOES IT WORK?

The issue of constructional explosion protection in grinding plants and storage facilities is very multifaceted and needs attention with regard to the following themes:

 Explosion venting in combination with explosion pressure shock resistance to the relevant degree. This is mainly applicable for:



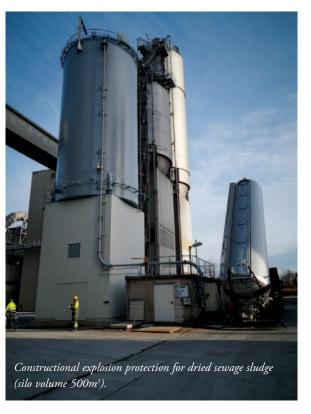
❖ Protection of bag houses: taking the related Rule (EN 14491) into account. Apart from the explosive characteristic values, K St / p max the enclosure's pressure shock resistance is one of the decisive factors to determine the necessary area in order to sufficiently protect the bag house as part of

the coal grinding system. From experience, this value of pressure shock resistance is between 100–400mbar g. Additionally, the obstruction of the

- venting path by filter bags should be avoided right from the beginning of the design stage.
- Protection of fuel silos: taking the related Rule (EN 14491) into account.

As a result of the cylindrical shape of such enclosures, it is quite feasible to reach a





pressure shock resistance of 2 bar g (max. value as stated in the relevant Rule). This max. pressure shock resistance leads to the lowest possible venting area, depending on the efficiency factor of the venting equipment to be installed.

2) Explosion venting respectively explosion de-coupling in combination with explosion pressure shock resistance to the relevant degree.

In the past, explosion risks caused by dust explosion transmission through pipes and ducts of interconnected plant in units, have caused serious damages. This scenario is generated by a secondary dust explosion, the so called 'Flame-jet-ignition' which results in very high explosion pressures in the connected enclosure. To limit the extend of dust explosions and to prevent violent secondary explosions due to explosion transmission via pipes and ducts, explosion protection using suitable explosion isolation techniques, are mandatory. In grinding plants, the installation of explosion diverters, designed in accordance to the relevant Rule have proven their efficiency.

Techniques of intelligent concepts are available in order to effectively mitigate flame front propagation in dust-laden ducts. Thorwesten Vent carried out further research in form of various successful field tests with the French notified body Ineris.

The main aim is the mitigation of pressure pushing the flame front into the riser duct, in combination with the diversion of the largest possible portion of flame body. In grinding plants, explosion isolation measures in form of explosion diverters are mainly required. E.g. in riser ducts between mill outlet and bag house inlet as well as in any kind of ducts used as de-dusting pipes. Other mechanically operated explosion isolation devices (e.g. rotary airlocks, double flap systems of a certain pressure shock resistant degree) are necessary as well.

Self-reclosing, re-usable explosion venting devices

Self-re-closing explosion venting devices have been invented aiming at mitigating a fire inside the equipment. Mitigation respectively extinguishing of fire inside the equipment only works effectively, provided that ingress of oxygen is prevented and the injected inert gas e.g. CO₂, N₂ is kept in the system. Once open, the oxygen in the ambient air will increase the damages

caused by fire while injected inert gas is lost to the atmosphere without being effective. One benefit of this approach is the reusability of this venting device. In other words, no entire exchange of venting device(s) as it is the case for self-destructing devices is required.

CONCLUSION

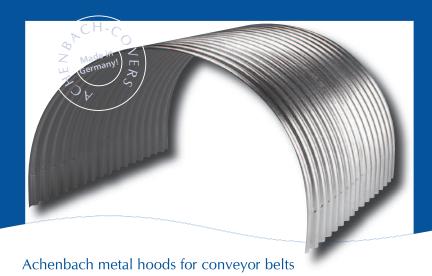
The technical design of grinding systems, storage facilities, etc. processing dusty media have to be based on the latest available standards. Any failure to consider relevant, necessary standards may lead to fatal incidents. Scrutinizing a proposed mill protection concept in the earliest stage of the acquisition procedure will prevent incorrect system protection. Investments

in follow-up costs in terms of system's modifications are avoided.

Storage and handling of alternative fuels as well as of biomass products play more and more an important role. substitution rate of coal by alternative fuels/biomass is steadily increasing, provided the infrastructure of the country concerned is given. This is especially true. with the processing and handling of wood pellets, wood shavings, saw dust, dried sewage sludge, meat and bone meal, etc. which is growing and requires special attention in terms of constructional explosion protection. The explosive specific values of wood pellets are even higher than lignite, which underlines the hazard of a violent explosion.

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Humber International Terminal evolves to handle wood pellets

The Humber Estuary is the UK's busiest trading estuary with around 40,000 shipping movements taking place each year. Here, Associated British Ports (ABP) operates four ports which handle over £80 billion of trade annually, equal to over 17% of all UK seaborne trade, with the Port of Immingham being the UK's largest by tonnage. Immingham is home to ABP's state-of-the-art Humber International Terminal (HIT) which handles a range of cargoes which include biomass, coal, animal feed, road salt and grains, and is able to accommodate vessels carrying cargoes up to 130,000 tonnes.

HIT was originally built for the discharge and handling of up to 12mt (million tonnes) of coal per year. As coal volumes have dropped significantly in recent years, ABP has adapted to facilitate alternative imports. The Terminal comprises two deep sea berths with a river quayside frontage totalling over 520 metres.

November 2014 saw the evolution of the HIT I Berth into an automated cargo handling facility focusing mainly on biomass (wood pellet) but also with the ability to discharge coal. The redevelopment and switch to biomass (wood pellet) has seen this part of the operation renamed the Immingham Renewable Fuel Terminal (IRFT). This was a £175 million project as part of a long-term agreement between ABP and Drax Power, to supply 4mt of biomass per year to Drax's Power Station in Selby, Yorkshire.

The IRFT is for the import, storage and onward transfer of renewable fuels to the regions power generating industry. The first phase of IRFT (July 2014) delivered the capacity to handle approximately 4,000,000 tonnes of cargo per year and store up to 100,000 tonnes on site at any given time, the second phase (October 2015) saw the annual throughput capability increase to 6,000,000 tonnes and onsite storage double to 200,000 tonnes.

The jetty is equipped with two continuous ship-unloaders (CSUs), which have the ability to discharge biomass at a combined rate of 2,400 metric tonnes per hour. The CSUs extract cargo from the ships holds via a series of enclosed screw conveyors, before depositing the cargo onto the first in a series of belt conveyors, which transfer the product to silo storage. At each transfer point, the conveyor system is equipped with dust extraction filters. These filters have the ability to remove airborne dusts during operation of the conveyor, with collected dusts being reintroduced back onto the running conveyor system preventing the need of disposal.

The IRFT conveyor/silo system is also equipped with various pieces of safety equipment including: thermal cameras within each silo which constantly record cargo temperatures; CO₂ and oxygen detectors in each silo, which alarm if deviating from normal levels; 'Fire Fly' spark detection is installed on all conveyors

which, if activated, would trigger the water deluge system dousing the conveyor/cargo at the point of detection; and a nitrogen injection system which can be manually deployed and has the ability to inert any given silo, with the aim of replacing oxygen, thus removing one element of the fire triangle.

The CSUs are also equipped with thermal imaging cameras which can detect any heated product within the vessel holds and with the same spark detection to the conveyors; if activated, an emergency procedure would be implemented whereby the heated product would be discharged to the quay.

All biomass product is delivered onto the rail network again via a series of fully enclosed conveyors before rail loading commences from the rail loading silo. This process also includes dust extraction filters, with collected product being delivered into each rail wagon.

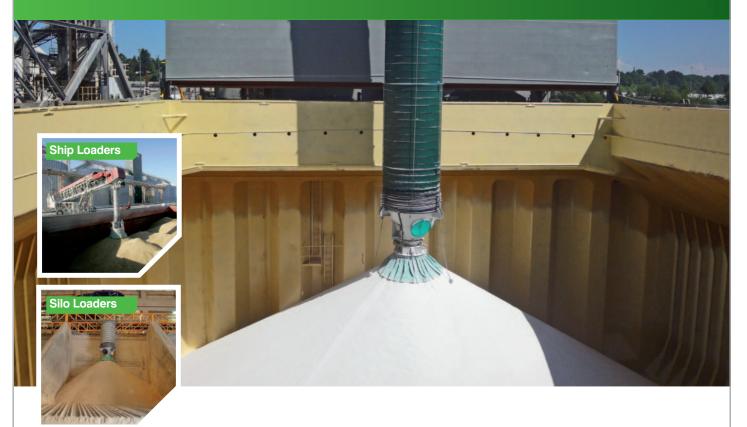
Specialized Drax rail wagons are loaded with up to 1,650 tonnes per train of biomass (typically 25 carriages in length) via the fully automated system which loads each train within 40 minutes. All rail wagons (IIA-D type) that handle biomass/wood-pellet products, have been specifically designed and built by the power generators/freight operating companies, and encompass the use of open/close top doors to prevent uplift of dust during transit as well as protecting against rain due to the cargo sensitivity to water.



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E-mail: enquiries@clevelandcascades.co.uk | Website: www.clevelandcascades.co.uk













Tarragona's biomass throughput falls from high of 2017

The evolution of biomass at the Port of Tarragona has shown significant fluctuations over the past years. Since 2017, the volume has dropped considerably, with slight recoveries in 2019 and 2023, but still without reaching initial levels. Tonnages

can be seen in the tables below.

The Port of Tarragona collaborates with several private companies that co-ordinate operational improvement projects, many of which are submitted to calls such as Ports

In general, these are technologies that use sensors to monitor the density of this type of cargo to optimize storage, detect high temperatures and combustion risk, and therefore enable preventive measures,

STATISTICS: MAIN DESTINATIONS (TONNES)											
Main destinatio	ons										
Country	2017	2018	2019	2020	2021	2022	2023				
Italy	18,729	_	4,525	7,671	_	_	_				
France	8,017	14,500	_	_	4,342	1,641	3,849				
Sweden	_	_	12,191	_	_	_	4,946				
Denmark	_	4,679	8,335	_	_	1,802	_				
Portugal	_	_	_	_	3,711	_	_				



BIOMASS TRAFFIC EVOLUTION AT THE PORT OF TARRAGONA (firewood, sawdust, and wood waste) Year Tonnes 2017 26,783.162 2018 19,203.987 2019 25,053.239 2020 7,671.082 2021 8,052.544 3,465.291 2022 2023 8,814.519

About the Port of Tarragona

The Port of Tarragona is located within a privileged Mediterranean city. coastal city of Tarragona and the port lie on the North-eastern Mediterranean coast of the Iberian Peninsula, at latitude 41° 04' North and longitude 1° 12' East. Located just 50 minutes from Barcelona, the sea, rail and air communications make this territory a privileged region on the Mediterranean corridor, and also a strategic enclave in the North-western European arc. This means that the port is a good choice in terms of logistics for connecting with the rest of the world, with accessibility and good connections with the rest of Europe

The Port of Tarragona offers a wide range of transport and connections to

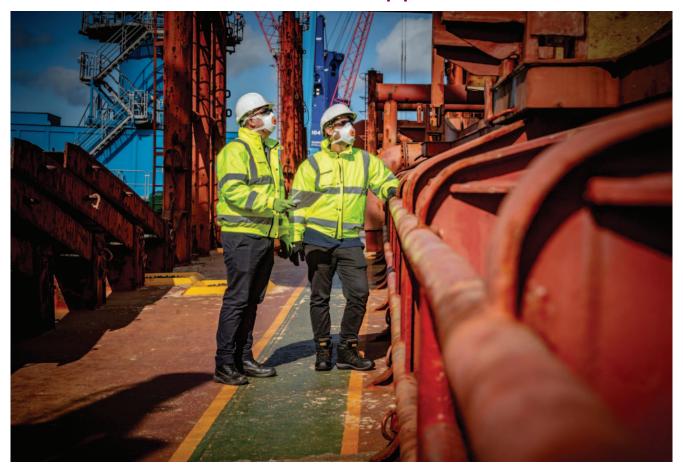
ensure that goods destinations in Spain and abroad

The Port and private companies are working to make new and more efficient storage systems and machinery possible

Being operational 24/7 makes the Port of Tarragona accessible even on public holidays, and with highly trained workers with experience and specialized It offers spaces and know-how. warehouses for the movement and storage of all types of traffic and goods, and an excellent diversification strategy make it more competitive and brings in new markets

Sustainability is a major focus for the Port of Tarragona. It strives to improve its activity so that it respects its surroundings and the environment. It believes that it should be an example and a main actor in the implementation of decarbonization strategies. It will do this through economic transition and environmental sustainability actions, while reinforcing measures for the preservation and recovery of the natural environment, emphasizing green energy generation and enhancing air and water quality monitoring in port zones. It is therefore prioritizing the creation of a energy community; electrification of the docks; increasing the generation of photovoltaic energy; promoting a more sustainable cruise activity; and cooperating with the Green Hydrogen Valley, etc.

The Maritime Division of John Good Group prioritizes the environment



The Maritime Division of John Good Group consists of DAN Shipping, Bay Shipping and Arthur Smith, which are major port agents, chartering and renewable service providers across the United Kingdom and beyond. DAN Shipping was established in Hull in 1987, Bay Shipping was established in Wales in 1992 and Arthur Smith, a fifth-generation family business, was established in 1936. Operating jointly, The Maritime Division offers efficient and professional port agency and chartering services worldwide. Handling over 10mt (million tonnes) of cargo every year and working with a range of clients, The Maritime Division of John Good Group ensures the seamless handling of vessels and cargo alike.

As one of the UK's preeminent independent bulk ships agents and charterers, The Maritime Division of John Good Group has seen an unprecedented rise in biomass through its operations. The group has a multitude of respected clients that handle and discharge biomass into the Humber estuary.

The Maritime Division of John Good Group caters to ship owners, operators, port authorities, crew members, and other maritime stakeholders, providing a seamless experience through an extensive range of port agency and chartering services. Its offerings include vessel clearance documentation, cargo customs clearance, crew changes, ship repairs, and maintenance, amongst others. It is a specialized expert in managing diverse cargo needs, evidenced by its handling of over 10mt of cargo each year.

The group has established relationships within the maritime industry and those with a passion for green energy solutions. The recent acquisition of Arthur Smith signifies a pivotal expansion for the John Good Group's Maritime Division. It gave the group entry into the offshore renewables sector, a growing marketplace within the industry.

As part of the John Good Group, The Maritime Division is working hard within the business to be accountable for its own ESG (environmental, social and governance) responsibilities, and it is equally aware that the wider energy industry is going through the same process, transitioning to a more sustainable future. The Maritime Division of John Good Group is working UK-wide to keep homes powered, stores stocked and keep Britain trading by facilitating the handling and moving of the biomass. The Maritime Division of John Good Group works together in collaboration to deliver exceptional services on a national level.

The Maritime Division of John Good

Group is proudly embracing its Group's ESG strategy, and it is proud to announce that at the end of 2022, it was operationally carbon neutral across all companies within the John Good Group. As an integral part of its business ethos, the division holds itself accountable for the positive outcomes it achieves through its meticulously crafted business plans. With unwavering focus, The Maritime Division of John Good Group strives for credibility through its actions, ensuring that its operations align with its mission of driving meaningful change.

The division is under way on its carbon reduction programme as part of the John Good Group. Examples of the changes and improvements implemented include renewable energy generation, the introduction of hybrid and EV vehicles, and a review of suppliers. Another example is the development of several people-focused initiatives aimed at carbon-contributing factors such as commuting miles.

The Maritime Division of John Good Group is in an industry that has material impacts on the environment, so reducing carbon output is essential. The division knows that reliance on carbon offsets is not the answer to the climate problems it is facing or to be relied upon for the answer to its responsibilities. By engaging

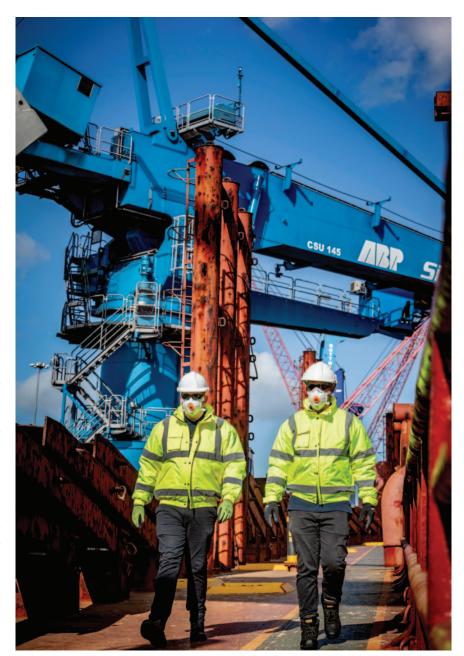
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and collaborating with those around, the division has the opportunity to challenge and influence others it operates with to help shape a greener future.

To develop a sustainable future, it is important to think about meeting today's needs and protecting the environment and resources for the future and that's what is happening at The Maritime Division.

The Maritime Division of John Good Group carries forward exceptional service and dedication to community engagement. Through the Matthew Good Foundation, it actively supports charitable causes and local initiatives, empowering its employees to make a positive difference in the world.

The Maritime Division has built a reputation for superb service and attention to detail. It delivers excellent service; in 2023 The Maritime Division of John Good Group won the Customer Care award at the International Bulk Journal Awards and in 2018 it won the Bulk Ships Agent Award. The Maritime Division is committed to cutting-edge technology, setting it apart as a major force within the shipping industry. Through ongoing investments, it has fortified its position. With meticulous attention to detail, the division has seamlessly integrated GATSHIP, a state-ofthe-art digital platform specifically tailored for its already proficient port agent team, into its existing systems and processes. With the rise in demand for biomass, this technological advancement gives the division's clientèle access to accurate realtime data and communication, ensuring optimal performance and exceptional service delivery.





Biomass handling with SAMMI's high-tech systems

Among the technologically advanced equipment offered by SAMMI is a range of systems to handle biomass cargoes. SAMMI is highly competitive in the complex, selective and extremely demanding sector of bulk handling industry, and it invests constantly to offer solutions that anticipate the needs of its customers.

Several of the company's biomass handling projects are detailed below.

Year: 2014–2015 Location: Italy

Description: Stockyard, bucket elevators, sidewall conveyor: engineering, supply and assembly of carpentries and machines for receiving, classification, storage and refining biomass plant. The project is characterized by the supply of two circular metal silos with a net useful volume of 500m³, with a flat-bottomed and mechanized rotating extraction system.

Customer: Europrogetti S.r.l. **End-user:** Unicalce Lecco S.p.a.

Year: 2004

Description: Handling system for biomass power plant: belt conveyor 650mm x 22m; intermediate storage hopper screw conveyor; belt conveyor 650mm x 12m.

System capacity: 500tph

Material handled: wood chips, pine

needles

Customer: Tecnocentro S.p.A./Bioter S.r.l. (ex Printer S.r.l.)

Year: 2006

Description: <u>Handling system for drying plant and stockpiling</u>: feed hopper; belt feeder 1,000mm x 11m; belt conveyor 650mm x 19m; belt conveyor 650mm x

System capacity: 1,000tph
Material handled: wood chips

Customer: Tecnocentro S.p.A./Bioter S.r.l.

(ex Printer S.r.l.)

Year: 2012

Description: <u>Handling and dosing system</u> to the lime kiln: pneumatic conveying system; intermediate storage silos.

System capacity: 1,000tph

Material handled: virgin and recovered

wood biomass

Customer: Unicalce S.p.A.

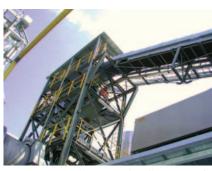
Year: 2014

Description: Handling and dosing system to the lime kiln: pneumatic conveying system; intermediate storage silos.

System capacity: 1,000tph







Four small pictures: handling system for biomass power plant, supplied in 2004.







Material handled: virgin and recovered

wood biomass

Customer: Unicalce S.p.A.

Year: 2022

Description: Handling and dosing system to the lime kiln: pneumatic conveying

system; intermediate storage silos.

System capacity: 1,000tph

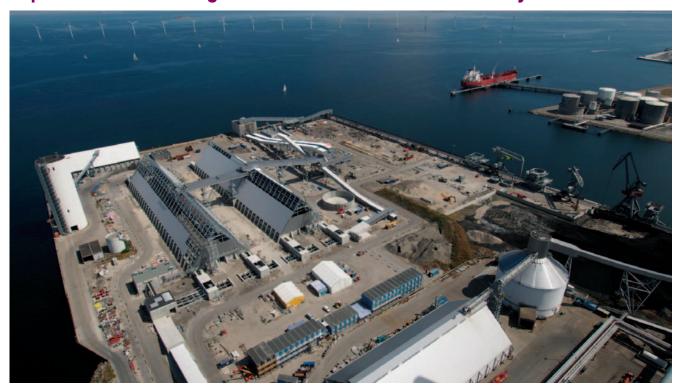
Material handled: virgin and recovered

wood biomass

Customer: Unicalce S.p.A.



Explosive biomass cargoes are in safe hands with Loibl systems



Bulk handling equipment specialist Loibl offers a wide range of bulk handling equipment including shiploaders and unloaders, conveyors, scrapers, silos, hoppers and much more.

CASE STUDY - PORT HANDLING WITH EXPLOSION PROTECTION

INNOVATIVE TRANSPORT SOLUTIONS FOR POWER PLANTS

In 2019, Loibl built a biomass transportation system in Copenhagen, Denmark. This project was particularly notable due to the risks of explosions when transporting biomass.

For HOFOR, the largest utility company in Denmark, Loibl designed an economically efficient, individual solution for the transport of biomass (wood chips) from the port to the incineration plant at the end of 2019. HOFOR supplies around 20% of the entire Danish population with water, heat, electricity and gas. Loibl supplied a facility with a total weight of around 390 tonnes of technical equipment. It forms the interface between ship and stationary conveyor technology. Including two massive hoppers with an octagonal opening and a dust return wall attached. This special shape already reduces the amount of dust during the wood chip loading. Under the hoppers there are trough chain conveyors (LASHCHAINCON®) in a particularly heavy design and with a clear width of 2,000mm. A total of 800m³/h of conveyed goods are withdrawn from each of these

LASHCHAINCON®s.

The feed hoppers are open at the top, this reduces the formation of an explosive atmosphere and ensures pressure relief in the event of an explosion. The material is withdrawn from the hoppers in the upper run of the trough chain conveyor below. A dedusting system automatically sucks up the dust generated during transshipment in the feed hopper and at the subsequent transfer points. Heavier dust particles are reliably transported away with the conveying flow.

Each of the so-called hopper cars removes a total of 1,600m³/h of material. In addition to the dust return, the hopper cars are equipped with dry extinguishing lines including spraying in the feed bunker and



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filters. In the event of a fire, the water is fed in by the local fire brigade with the dry fire line on the hopper car. In addition, a fire hose can be connected to a separate riser if necessary to extinguish fires on the hopper car. For cleaning, there are suction and wet cleaning lines on the hopper car, to which the operator can connect the corresponding equipment.

The hopper cars are coupled with the harbour cranes. This means that they can be moved individually and to any ship-unloading position on the pier. During the unloading pauses, the clamshell bucket and multi-section grab can be safely placed on the hopper car.

Loibl's scope of supply and services included:

- extensive engineering;
- production in Straubing, Bavaria;
- delivery of selected components;
- installation and commissioning on site;
 and
- conveyor technology for biomass transport: Feed hoppers, Movable steel construction, LASHCHAINCON®: discharge trough chain conveyor, control cabinet including cabling, dry fire line, suction and wet cleaning line, filter system (dedusting) including pressure relief device.

CHP — combined heat and power plants

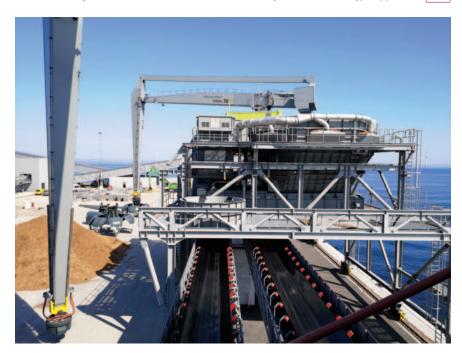
Combined heating and power plants are gaining in importance in connection with

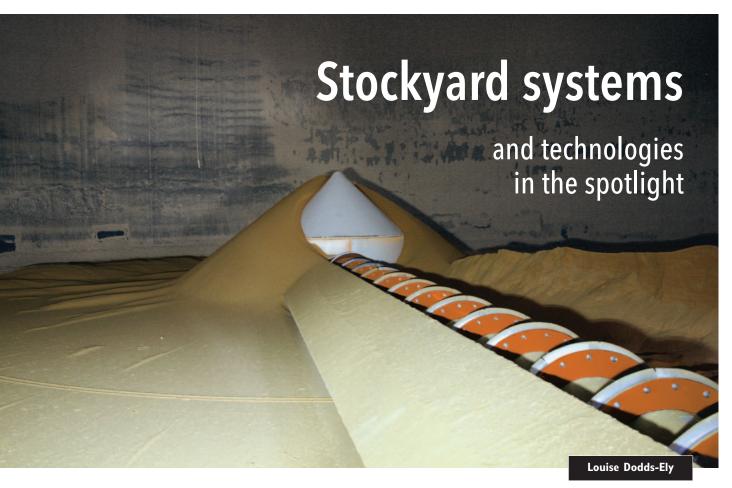
the striven fossil-fuel phase-out. Many power plant operators are already reacting to the ambitious climate targets of politics and are gradually converting their systems to renewable energies.

The transition process works with combined firing from fossil fuels and renewable raw materials, mainly wood. In the long term, there should be a permanent switch to the combustion of renewable energies. In this, it is vital to have an experienced partner who reliably supports the energy producers and industrial users with the changeover.

Loibl's process engineering for a cleaner environment

In the Port of Copenhagen, 3,200m³/h of biomass are handled daily at the Amager-værket power plant. The amount of dust that arises during loading increases the risk of ignition. With over 60 years of experience in individually conceptualized bulk materials transport and as a competent partner in fire-endangered and explosive bulk goods, Loibl developed an innovative, ATEX-compliant conveying concept that more than lived up to the expectations of the largest Danish energy supplier.





Stockyards improving operational efficiencies by investing in feed storage automation: moooove over, conventional thinking!

Save money now? Or save money later? That's the question stockyards around the world are asking themselves as they attempt to sustainably grow their businesses while meeting the needs (and appetites) of a growing world — all at the same time, writes Mandi Steffey, Laidig Systems Inc. It's definitely no easy decision to make, but some are getting ahead of the curve early by putting their faith in the future via new process technology.

What was once an industry hyperfocused on cost savings, stockyards today are opening themselves up to new ways of operating. With several million tonnes of dry bulk material running through these facilities every single year, for some companies, making large investments is essential if they want to stay competitive in a tight marketplace.

One often-overlooked area to improve efficiencies at stockyards is feed storage. Cattle have to eat, and that feed takes up space and resources. The material also requires heavy labour to move, handle, and deal with on a daily basis.

The traditional way of handling large amounts of cattle feed ingredients like DDGS (Dried Distillers Grains with Solubles) and others at stockyards usually comes in three parts:

- I. A big, flat storage building
- 2. A gas-guzzling payloader
- 3. Several employees tasked with moving and removing that feed

This three-pronged approach made a lot of sense for a long time. For many companies, it was the simplest and cheapest way to get the job done. But as some businesses are starting to realize with growth, when the volume of feed goes up, this old-school method actually becomes expensive, dangerous, and is rendered inefficient in the long run. Instead, these businesses are finding that automation equipment — which may have been out of reach for them in the past — can save them from overspending and taking unnecessary safety

Let's break down an example of one cattle operation in Mexico that came to this realization recently.

This company in particular was embarking on the huge task of essentially doubling its cattle count from 250,000 head to 500,000 head. The business raises the animals for slaughter before selling the meat on the marketplace, and to control costs and quality, many aspects of the

operation are vertically integrated, including the entire feed production process. Operators wanted to inject even more efficiency, however, in an attempt to maintain control of the raw products going into the process and to increase the marketability of the company's unique product lines.

To bring down the feed production cost per ton, operators there needed to reconfigure the batch feed milling process because it took a lot of time and resources to manage. With a goal of producing and mixing 2,400 metric tonnes of feed in eight hours every single day, this was not an easy undertaking with an obvious solution.

The company worked with Laidig Systems, Inc., an automated bulk material storage and reclaim system designer and manufacturer based in the United States, to totally retool how feed is mixed and distributed out to the various corrals, each with a 60–100 head count, across the cattle yard.

"You can't imagine the truck traffic to feed this amount of animals with varying recipes per corral," said John Koorn, International Sales Manager at Laidig. "They need to increase quality and eliminate errors. That happens through automation."

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For this project, Laidig designed multiple screw-type silo bottom unloading systems to automatically store and unload large quantities of individual feed ingredients in individual silos. The facility keeps two silos full of DDGS (each with 15 days' worth of storage), as well as two silos each (with one days' worth of storage) of materials like steam-flaked corn, haylage, corn silage, soybean meal, and others.

Operators can then automatically unload those ingredients in specific ratios to create different recipes for their varying animal weights and meat types. For example: for a high-fat beef product, operators utilize more steam-flaked corn in the mix. Those specialized feed mixes then go into their own 'final product' silos equipped with their own automated reclaiming and unloading systems. This streamlined process, which skips the sometimes-haphazard batch process, allows for the ratios to be much more precise, resulting in better feed conversion and, in turn, cost savings.

Along with long-term cost savings, the quality of the material increases with automatic storage systems, cutting down on mold, fungus, insect infestation, and

compaction and flow issues, yielding a safer and better feed product overall for the animals. The higher quality feed results in a better-quality beef, which only increases the marketability of the facility's products. With the new feeding procedures, the company will be able to even further diversify its end-products, enabling them to market specific cuts and kinds of beef to distinct demographics all over the world.

"This company is all about innovation, and they invest in that innovation. This is why they remain in such a strong market position," Koorn said.

The entire material moving process is handled automatically with push-button technology and eliminates antiquated tractors and machinery typically utilized in batching. Laidig's reclaim systems use a patented, heavy-duty advancing and rotating reclaim auger to draw material down and out of silos without anyone ever having to enter the silo at all.

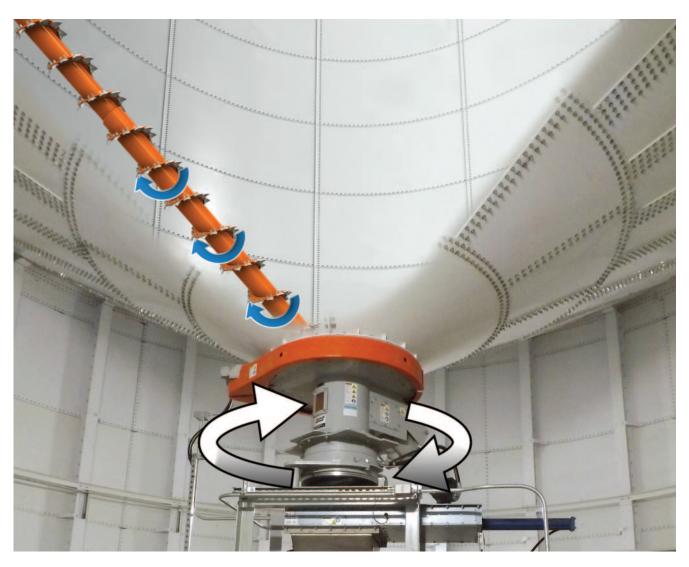
While the process is much different than what the facility was initially used to, it's a welcomed change. The switch from a batch feed process to this new, in-line mixing configuration saves the facility time, man hours, and money in the long run. It's

easier and safer to work with, too.

While this project is still in progress and in the building stages, the benefits can already be clearly seen. Laidig has helped thousands of companies solve storage problems exactly like this one through the last several decades, and has noticed a large uptick in expansion activity with stockyards in particular in recent years, with feed quality and operational efficiencies being the main drivers.

"The companies that are on the cutting edge of this industry are world class. They vertically integrate their processes and commit to quality and efficiency improvements, because those improvements drive them directly to better products and market share," Koorn said. "They aren't afraid to change the status quo and challenge how they've always done things."

As the growth trend continues in this industry, the storage needs at facilities will only become bigger and more complicated. That's why it's very important companies do their research and make smart investments sooner than later to stay competitive an ever-changing marketplace.



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The role of wind fences in modern dry bulk stockyard management



Dust control, inventory management and environmental stewardship are an essential consideration in the management of dry bulk stockyards, writes Claire Cowie from WeatherSolve Structures. Technologies used to optimize stockyard operations are diverse and offer the ability to streamline operations, lower costs, and reduce the overall environmental footprint of a site. Of these technologies, wind fences emerge as a transformative asset for stockyards; capable of tackling hazardous dust emissions and reducing the loss of valuable product all while improving safety and regulatory compliance.

UNDERSTANDING WIND FENCES

Wind fences are barriers that are constructed to alter wind patterns and reduce fugitive dust. They are typically constructed by erecting a porous material that acts as a barrier between the wind and the area to be protected. In general, wind fences have two mechanisms of action to reduce dust: an upwind fence or a downwind fence. Upwind fences dramatically lower wind speeds and minimize dust dispersion and movement, while downwind fences act as a 'catch' fence for dust that is still moving. In a downwind fence, there is a small sheltered area in front of the fence that functions as a drop-out zone for dust

when the fence is perpendicular to the wind direction. Some dust also passes through the downwind fence causing dust to drop out in the same manner as an upwind fence in a protected area that extends one to two shelter heights downwind. As dust erosion studies have shown, the majority of dust does not generally exceed Im above the ground, meaning any height of a downwind fence can be effective, although this is dependent on each individual site and its dust control strategy. It should be noted that with changes in season and wind directions, an upwind fence may function as a downwind fence and vice versa.

The porous material that is used for wind fences allows a small amount of wind to pass through, thus substantially reducing the turbulence which is seen with solid barriers. A quality well-designed wind fence creates a sheltered area on the leeward side where the wind speeds are typically reduced by 50% to 80% depending on the shelter patterns the fence designer is working towards.

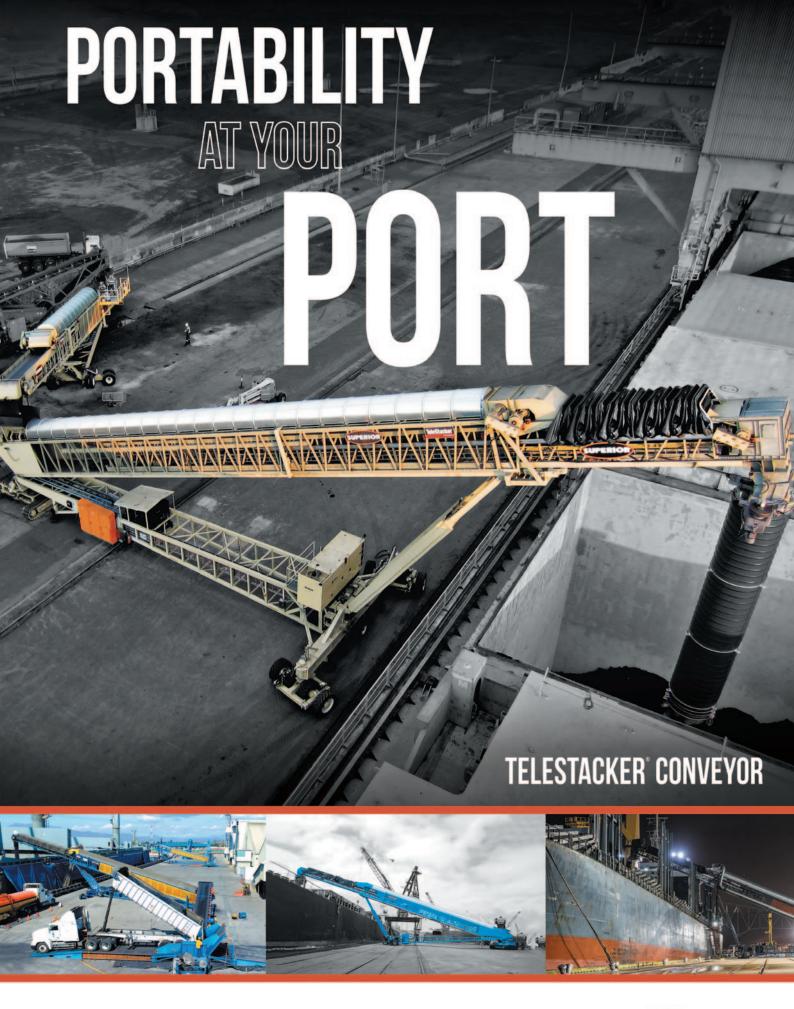
The aerodynamic porosity and the porous opening dimensions of the material also impact the effectiveness of the wind fence. The aerodynamic porosity is the porosity the wind 'sees'. It is different than the visual porosity. For example, consider

the I" x 4" timber slats used on snow fences — a different type of wind fence — (with a slat, then a 4" gap, then another slat). Visually these are 50% porous. Aerodynamically, the porosity is closer to 25% as the corners of the slats create micro-turbulence that decreases the porosity. This is good for slowing wind but bad for controlling dust as dust would pour through the 4" gap. In fact, that is why snow fences are built that way - so snow will go through the gaps and settle out into a mound behind the fence. Clearly fences with large porous opening dimensions are not good for containing dust in a downwind mode though they may be efficient in an upwind mode.

In general, materials with porous opening dimensions greater than I" and fences that do not go all the way to the ground are very poor at containing dust. Tightly meshed woven fabrics such as high-density polyethylene or polypropylene as tested and utilized by the industry experts at WeatherSolve Structures have been shown to be an effective wind fence fabric choice as they function efficiently in both upwind and downwind mode.

REAL-WORLD SUCCESS STORIES

There is an abundance of real-world examples that illustrate the effectiveness of



As alternatives to more costly stationary ship loading systems, custom-configured mobile conveyors deliver lower capital investment, quick onsite assembly, ease of relocation, and the ability to function efficiently with a limited footprint.



BUILDING THE BEST FOR OVER 40 YEARS

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wind fences in reducing dust emissions and improving operations for dry bulk stockyards. For instance, in one stockyard in Florida, a custom designed wind fence (with a unique stress-release clip system to protect the structure during extreme weather events) was developed to reduce bagasse (dried and pulped sugar cane stalk) erosion and dust. The source of the erosion and dust was due to incoming winds as well as loaders shifting the pile. The stockyard had originally been using a bunker system to control the dust, however; the turbulence created by the wind moving up and around the solid barrier reduced its effectiveness and resulted in a loss of the bagasse product not to mention the dust wreaking havoc on the site and surrounding community.

The stockyard's primary goals were to reduce unwanted dust and product loss, as well as protect the surrounding community from the effects of air borne particulate matter. In this instance, an upwind and a downwind fence were custom designed to meet the needs of the site and effectively reduce dust emissions. The implementation of this wind fence technology resulted in substantial cost savings and a positive impact on the surrounding environment.

Another example of the real-world efficacy of wind fences in optimizing dust suppression in stockyards takes us to Australia where a cement manufacturer maintained multiple stockpiles of limestone. This site had historically used surfactants as their primary method of dust suppression but were plagued with significant dust plumes when the pile was disrupted causing a negative impact on operations and nearby neighbourhoods. In



many cases, a wind fence can be used with other methods of dust suppression such as surfactants, foam, water and other sprays to optimize their effectiveness. When utilized alone, these other methods of control do not provide the dust containment that a well-designed wind fence can provide — especially on a dynamic stock pile. A tailormade portable wind fence was designed

and implemented that would allow the site to customize wind fence placement based on the shifting location of pile activity and wind direction. When not required for dust suppression, the fence could be moved along the perimeter of the site as not to interfere with operations. The result was a smaller environmental footprint, significant reduction of dust, and happier neighbours.



The integration of wind fences into dry bulk stockyard management represents a reliable and effective way to address the challenges of dust management and operational efficiency. As evidenced by real-world examples, a well-designed custom wind fence that addresses the specific needs of a stockyard can mitigate hazardous dust emissions and reduce the impact of said dust on the surrounding environment.

The adaptability and effectiveness of wind fences showcase their ability to transform dust mitigation strategies even in the harshest environments. As regulatory pressures and environmental concerns continue to rise in industry, the technology of wind fences is crucial for stockyards who prioritize environmental stewardship and safety.



Maintenance & service on conveyor belt cleaners with Martin Engineering

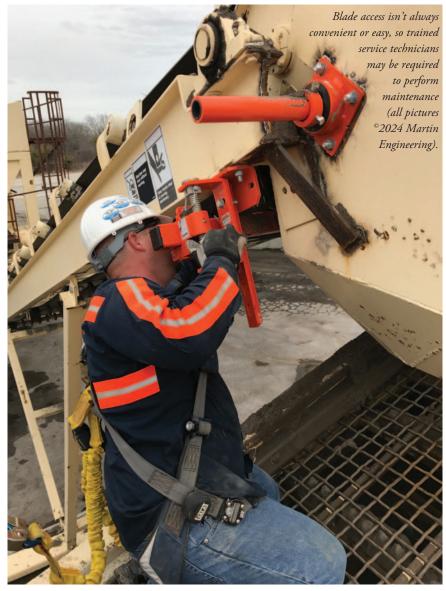
The need for conveyor belt cleaning is well established, write Alan Highton of Martin Engineering and R.Todd Swinderman, President Emeritus. Belt cleaners help reduce accumulations of carryback under the conveyor and minimize the release of dust from buildup on rollers as the carryback dries. A belt cleaning system performing poorly will contribute to build-up on pulleys and idlers on the return run. That material buildup is one of the primary reasons a belt will mistrack, causing damage to its edges, and it can also attack the covers of the belt through abrasion. The belt is typically the most expensive piece of equipment on a conveyor, so by not removing carryback at the discharge it will contribute to premature belt failure.

Excessive fugitive material can reduce component and belt life by as much as 30%, while a multiple belt cleaner system contributes less than 5% to overall belt wear, delivering a significant benefit [1]. Further, the effect of a properly adjusted cleaner on the belt is far less than one that is under- or over-tensioned and allows material build-up to contribute to increased wear. For operators who have 'tried them all' and can't find a cleaner that works, it could be that the problem isn't the equipment, but the maintenance. A managed service relationship from a factory direct, manufacturer-trained technician may be the solution.

It's no secret that belt cleaners require frequent inspection and adjustment to perform at a level that meets or exceeds expectations. The optimum solution must include the right belt cleaners, mounted in the correct positions and proactively serviced to deliver a positive cost benefit month after month. Correctly installed and maintained belt cleaners reduce direct costs by reducing cleanup labor and indirect costs by improving safety, minimizing dust emissions and increasing component life.

A basic question for all conveyor systems is whether maintenance personnel are trained in selecting the proper belt cleaning system, installing it correctly, what to look for on inspection and how to set the proper cleaning pressures. It may sound pretty elementary, but there is a great deal of knowledge and skill required to tune a belt cleaning system to work under varying material, environmental and belt cover conditions, while still operating effectively and economically.

Belt cleaner manufacturers know that if their equipment is not maintained, the



blame typically falls on their components and not on the lack of proper service by inhouse maintenance crews. As a result, the money spent on belt cleaning equipment is often wasted. When performance falls to a level that can no longer be tolerated, the equipment is scrapped and another supplier's cleaners installed, only to have the cycle repeat itself.

In contrast, some manufacturers provide factory-trained direct service personnel and replacement parts — delivering expert maintenance for optimum performance and component life. A few will even supply free remote monitoring and reporting equipment that's accessible by wi-fi or cell phone. These managed service technicians, supported by a financially stable, well-established manufacturer and armed with the specific knowledge and equipment to do the job, are often the answer to common belt cleaning problems. For these technicians, who spend every day assessing and servicing belt conveyors, maintenance

and repairs become more of a precise science than a judgement by rule of thumb.

THE PROPER EQUIPMENT

The number and style of belt cleaners depend upon balancing many factors [2]. First, the level of cleaning required for the application must be established. Aggregate mining can often tolerate more carryback accumulation, because an acceptable level of cleanup can be done with mobile equipment and minimal manual follow-up to keep the conveyors operating. Other applications, like coal mining or power generation, cannot tolerate much

Grannes; U.S. Dept. of the Interior, Bureau of Mines; Pittsburgh, PA; 1989.

^[1] Findings from a Study of Belt Cleaner Blades and Belting. R.Todd Swinderman, SME Coal Handling and Storage Conference and Exhibition St Louis, November 2011

^[2] Basic Parameters of Conveyor Belt Cleaning; C.A. Rhoades, T.L. Hebble, and S.G.



carryback because of the potential for accumulation to be the fuel in a fire triangle or explosion pentagon.

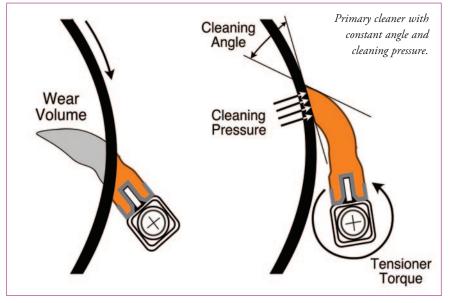
Once the level of cleaning is established, the next task is determining the type and number of cleaners required to do the job. Open pit aggregate mining may achieve acceptable performance with a single cleaner, while coal handling may require three or more cleaners to reach a satisfactory cleaning level. The trend in belt cleaning regardless of application is to plan for two or more cleaners per discharge. In addition to better cleaning from multiple cleaners, there is a redundancy factor that can provide a longer service interval window.

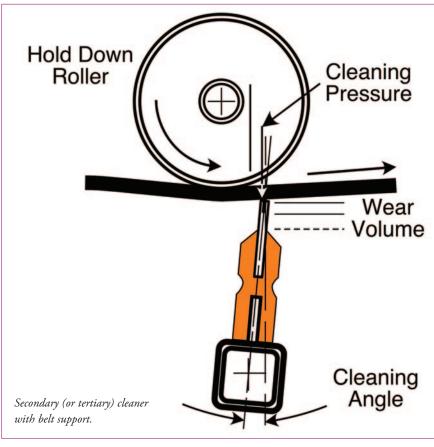
With the level of cleaning and the number of cleaners established, the appropriate materials of construction for the frame and tensioner are evaluated (e.g. stainless steel or powder coated mild steel) and the best blade for the application selected.

EFFECTIVE LOCATION

In chapter two of the seventh edition of its design guide, Belt Cleaners for Bulk Materials, the Conveyor Equipment Manufacturers Association (CEMA) specifies the cleaning locations as Primary, Secondary and Tertiary. The most desirable location for belt cleaners is on or very close to the head pulley in the primary position, so the material can fall with the main flow of material and reduce build-up on dribble chutes. If cleaning must be done away from the head pulley, cleaners are preferably mounted in the secondary position. If the secondary position is not accessible, cleaners may be mounted in the tertiary position, but this may require a second dribble chute or collection pit.

Many conveyors are designed without much consideration for belt cleaner location, despite the critical role they play in meeting production goals. Poor









conveyor head designs often have the structure obscuring the optimum mounting location or simply not enough room at the head to install or access them so they can be serviced. When faced with these restrictions, just one cleaner or installing it any old way isn't good enough. Facilities need a supplier partner that can make the best decision on equipment and location for their specific situation.

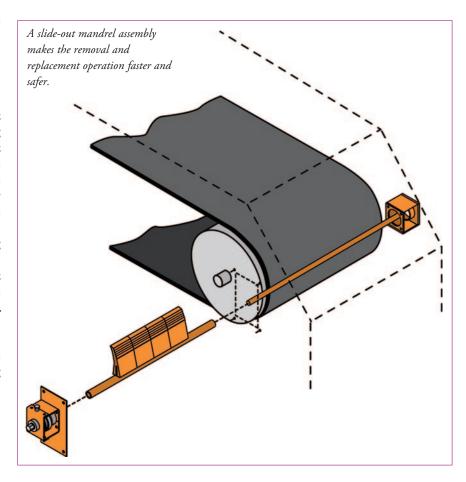
EXPERT SERVICE

The US Bureau of Mines and several researchers since have established that there are sweet zones for cleaning pressures for different styles of belt cleaners [3]. Outside of these ranges the cleaning performance is lower, while the blade wear, belt wear and power consumption are higher. Reputable manufacturers design their cleaners and tensioners to achieve optimum cleaning performance vs. blade wear. It may seem counter-intuitive, but if the cleaner isn't doing a good job, more cleaning pressure can actually make the problem worse. Maintenance personnel must understand these phenomena and know how and when to adjust each style of cleaner. Some sophisticated users optimize their cleaning

[3] Swinderman, Todd; Marti, Andrew; Marshall, Daniel: Foundations for Conveyor Safety; Martin Engineering; Worzalla Publishing Company; Stevens Point, Wisconsin 2016. https://www.martineng.com/content/product/690/safety-book performance vs. blade replacement costs by testing different blade materials at different cleaning pressures and changing blade materials and cleaning pressures for different seasons or ROM (run of mine) conditions.

INSPECTION AND MONITORING

Some manufacturers offer conveyor inspections and cleaner maintenance as part of a managed service relationship. Their monitoring systems can track component wear and update the service



Net Present Value of Cash Flows Minus Initial Investment		\$87,270 free cash flow Over 5 years of managed service									
Net Present Value of Cash Flows	\$94,770										
Net Cash Flow (Savings – Costs)	Laverne	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000					
Managed Service & Parts Cost		\$5,000	\$5,000	\$5,000	\$5,000	\$5,000					
Reduced Citations Savings											
Increased Component Life Savings					-						
Increased Availability Savings					-						
Reduction in Injuries Savings											
Cleaning Labor Savings		\$30,000	\$30,000	\$30,000	\$30,000	\$30,000					
		Year 1	Year 2	Year 3	Year 4	Year 5					
Initial Investment	al Investment \$7,500					Year-by-Year Savings & Costs					
Cost of Capital	10%										

Sample Data for a decision based on Return on Investment calculation

technician and/or operations personnel via wi-fi or cell phone on upcoming service needs. There are some new systems that can even adjust belt cleaner tension automatically. The technology will also send an alert through a mobile app in the event of upset conditions.

Factory-trained service technicians provide an added set of eyes on the conveyors, travelling to and from the equipment to be serviced and logging details in their service reports. Because they see so many different applications, they can often alert on problems that maintenance personnel don't see or have become accustomed to ignoring. With factory-direct managed service, the responsibility for maintenance falls on the manufacturer, allowing the staff to focus on other priorities.

SAFETY

A trained belt cleaner service technician is aware of hazards involved with maintaining belt cleaners. The indirect costs of an injury or accident can be significant. Inhouse maintenance and cleaning are two job classifications that are exposed to significant potential for muscular or skeletal injuries and are typically involved in more than half of reportable lost time accidents.

In many operations, a supplier's ability to work in the facility is directly related to its safety record. Having a trained provider that focuses on safety but at the same time is more productive than in-house maintenance can be a significant benefit. Keeping the shutdown to a minimum is important in meeting process availability goals. There are specialized systems for servicing belt cleaners where the belt runs

24/7 and can't be shut down, but virtually all other cleaner maintenance must be performed following lockout, tagout, blockout and testout (LO/TO/BO/TO) procedures.

THE RETURN ON INVESTMENT

At first glance it may seem that a plant has the in-house capacity to maintain belt cleaners, and hiring a managed service provider just doesn't make sense. The reality is a conveyor will run with a belt, a head and tail pulley and a drive maintaining everything else can be put off (and often is) for production at any cost. A 'run till broke' philosophy means more than broken machinery — it can exacerbate financial issues and affect worker morale, too. Then, in the rush to patch things together, maintenance workers are tempted to take shortcuts and work around established procedures, exposing them to greater potential for injury [4].

A common injury for cleaning labourers is a muscle or back strain. The Occupational Safety & Health Administration (OSHA) Safety Pays Calculator puts the direct cost of a muscle strain at \$33,000 and the indirect costs at \$36,000 — for a total cost of a single incident at \$69,000. That's a lot of managed service hours and replacement parts!

Every minute of downtime for cleaner maintenance counts. A managed belt cleaner service program can cut the downtime to a minimum because they have the knowledge, the right tools and parts and are aware of the safety issues involved.

When calculating the return on investment for professionally installing and maintaining belt cleaners, the analysis

should be done over the life of the belt cleaner assembly using a net present value calculation. Many spreadsheet apps have a net present value function in Formulas. For example, if: the cost of capital is 10%, the initial investment is \$5,000, cleaning labor savings is \$6,000 per year and service & parts are \$2,000 per year, the NPV of the cash flow (discounted by the cost of capital) is \$15,163. Subtracting the initial investment and the managed service cost, this example generated over \$10,000 in free cash flow over the life of the equipment without considering all the other potential savings. The spreadsheet makes it easy to change the inputs and compare different equipment and savings scenarios.

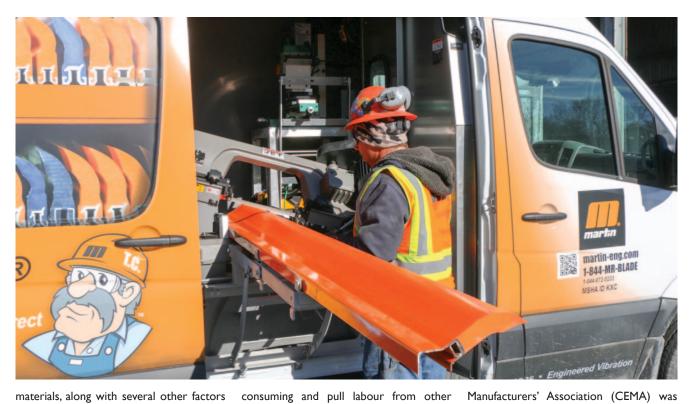
The following example is based on simply reducing cleanup labor by 2,000 hours per year at \$15 per hour. Other benefits should also be factored in — although not estimated in the example below — such as the savings from avoiding injury, increased equipment availability, improved equipment life or reductions in citations and fines. Facility managers often find that the cash flow values are surprisingly large over the life of the equipment and service relationship.

A typical belt cleaner assembly should last five years with minimal frame or tensioner repairs. Inspections should be done regularly and any problems addressed immediately. Some manufacturers with factory-direct service offer free replacement and upgrades of frames and tensioners as part of their managed service offerings.

Blade wear will vary based on the blade material and abrasiveness of the bulk

DCi





materials, along with several other factors such as correct cleaning pressure. Belt wear from the cleaner is typically in the neighbourhood of just 2% per cleaner, so concerns over blade type and cover wear are usually unfounded. The cost of safety is minimized by reducing the frequency and hours of manual cleaning and therefore the exposure to injuries.

A NPV analysis will often show such a large free cash flow that worrying over the cost of service or replacement blades is a misplaced concern. Similarly, a NPV analysis done when designing a new conveyor will often show there is no reason to skimp on the details or costs that improve belt cleaner performance and access for service.

CONCLUSION

Allowing the blade to wear past its limits, having the wrong tension or installing a cleaner system that is hard to access creates hazards for workers and can lead to excessive downtime. Automated tensioning and monitoring equipment mitigates some of the issues with blade wear and provides data and alerts when blades need servicing. This can help lower labor costs and improve safety due to fewer inspections and proactive maintenance.

Belt cleaner maintenance can be time-

[4] Swinderman, Todd; Marti, Andrew; Marshall,

Daniel: Foundations: The Practical Resource for

Cleaner, Safer, More Productive Dust & Material Control, Fourth Edition. Martin Engineering; Worzalla

https://www.martin-eng.com/content/page/552/

foundations-conveyor-systems-book

Publishing Company; Stevens Point, Wisconsin 2009.

service technicians who know the equipment and safety procedures and can respond quickly to customer needs. Considering a managed service program can make safety and productivity sense and improve profitability with additional positive cash flow. **ABOUT THE AUTHORS** ALAN HIGHTON/NATIONAL SALES MANAGER/

essential tasks, so it's important to choose

a supplier with trained and experienced

MARTIN ENGINEERING

Alan Highton began his career as a qualified millwright, after receiving his N6 National Certificate in mechanical engineering in South Africa. Highton joined Martin Engineering in 1996 as a service technician and was promoted to a sales position in 1999. He was named the RSA sales manager in 2006 and in 2012 was promoted to North American sales manager. He currently serves as the North American sales manager for Martin Engineering's Wear Components division.

R. TODD SWINDERMAN, PRESIDENT EMERITUS/ MARTIN ENGINEERING

R. Todd Swinderman earned his B.S. from the University of Illinois, joining Martin Engineering's Conveyor Products division in 1979 and subsequently serving as V.P. and General Manager, President, CEO and Chief Technology Officer. Swinderman has authored dozens of articles and papers, presenting at conferences and customer facilities around the world and holding more than 140 active patents. He served as President of the Conveyor Equipment Manufacturers' Association (CEMA) was the editor of CEMA's 6th and 7th editions of Belt Conveyors for Bulk Materials, The Design Guide for Belt Conveyors. Swinderman is active on several CEMA committees including Chair of the Bulk Safety Committee and is a member of the ASME B20 committee on conveyor safety which set US conveyor safety standards. Swinderman retired from Martin Engineering to establish his own engineering firm, currently serving the company as an independent consultant.

ABOUT MARTIN ENGINEERING

Martin Engineering has been a global innovator in the bulk material handling industry for more than 80 years, 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 22,000 print copies in circulation around the world. The 500+ page reference books are available in several languages and have been downloaded thousands of times as free PDFs from the Martin website. Martin Engineering products, sales, service and training are available from 17 factoryowned facilities worldwide, with whollyowned business units in Australia, Brazil, China, Colombia, France, Germany, India, Indonesia, Italy, Malaysia, Mexico, Peru, Spain, South Africa, Turkey, the USA and UK. The firm employs more than 1,000 people, approximately 400 of whom hold advanced degrees.





EP/EPC/EPCM "TURNKEY" PLANTS

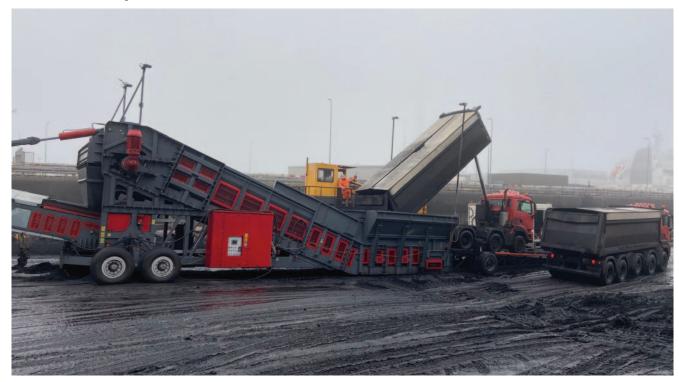
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Telestack installs a new Titan W800 truck unloader for dry bulk storage and transshipment



Telestack, in collaboration with its long-term partner Van der Spek Vianen (VDS), has successfully installed and commissioned a brand-new, 70-tonne mobile Titan W800 truck unloader at Lansers Trio in the Netherlands.

The Titan W800 is a versatile, wheel-mounted mobile truck unloader designed to facilitate direct unloading from trucks. It features a robust heavy duty apron chain feeder that allows 50-tonne road dump trucks and wheel loaders to unload material directly into the rear of the unit.

The Titan series of truck unloaders is ideal for eliminating the need for double handling of materials, ensuring a seamless and efficient 'direct' discharge from the

truck. Prior to the installation of the Telestack W800 at Lanser Trio, the operator was required to dump materials onto the ground and then handle them again using wheel loaders, which significantly increased costs per tonne and led to material degradation due to fuel spillage. The new system streamlines the unloading process, reduces operational costs, and preserves the quality of the materials.

The Telestack Titan W800 wheel-mobile was meticulously designed through a collaborative effort involving Lansers Trio (the customer), VDS (the Telestack dealer), and Telestack Ltd. This close partnership ensured that the Titan W800 would fully

meet the customer's diverse application requirements. The project exemplifies how Telestack and VDS, leveraging their custom design capabilities, push the boundaries of innovation to satisfy the demands of even the most challenging applications.

FEATURES OF THE TELESTACK TITAN W800 TRUCK UNLOADER

The W800 is a versatile piece of equipment specifically designed as a wheel-mounted truck unloader, featuring an integrated tow hitch for easy mobility across the site. This design element is crucial, as it allows the truck unloader to be easily repositioned as needed, enhancing its multi-functional capabilities. The W800 can be effectively used for various tasks such as reclaiming materials, feeding auxiliary equipment, and supplying material to shiploaders. This flexibility makes it an essential component in streamlining site operations.

The W800 truck unloader for Lanser Trio was engineered to handle a diverse range of materials, including cokes, coal, and slag. The truck unloader is capable of efficiently managing materials with varying properties, ensuring seamless operation when unloading from 50-tonne trucks. It is designed to process between 600/700 tonnes per hour meeting the demanding requirements of the operation.

This is an all-electric driven unit as requested by Lanser Trio for higher efficiency and lower global footprint. It







- Rugged and dependable magnetic
- coupler for dusty environments



- Corrosion-resistant, long-life rollers; precision sealed bearings
- Systems customized for the application
- Preassembled option, for easy installation



- Allow infinite rotation
- · Combined power, control and media (water, air, oil, vacuum, other)
- Available with ATEX and SIL 3 certification

Rugged Energy & Data **Transmission Systems**

Conductix-Wampfler has one critical mission: To keep your bulk material handling operations running 24 / 7 / 365. You need proven, worryfree energy solutions - and Conductix-Wampfler has them. Our systems provide reliable electric power and water to stacker/reclaimers, barge and ship loaders/unloaders, bulk conveyors, tripper systems, and gantry cranes. Conductix-Wampfler systems are rugged, low maintenance, and timetested in tough, dusty environments. All products are backed by the largest sales and service network worldwide!

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features a 'plug and play' system that seamlessly integrates onsite solar power with the main electrical grid, allowing for optimal use of renewable energy. Key electrical features include a blocked chute switch on feeder discharge point, radio remote control for all features on the truck unloader, LED lights and stainless-steel control panel engineered for durability in demanding environments. This is all enclosed with an IP 66 high grade control panel which is essential for protecting the control panel from dust and moisture infiltration, ensuring reliable operation even in harsh conditions.

The W800 is equipped with a variable speed drive, allowing for precise control of belt speed to efficiently handle a variety of To further enhance its performance, the unit has been upgraded with dust suppression covers, significantly reducing airborne dust during operation. Additionally, this mobile truck unloader can be optionally fitted with a radial trimming Telechute. This attachment is specifically designed for managing other types of dusty materials and facilitates direct loading onto barges and coastal vessels, making the W800 a versatile solution for a range of material handling needs. A large ramp was fitted with the W800 by Telestack to provide easy access for the dump trucks to reverse to the rear of the unit. This setup is crucial for optimizing the loading process, ensuring that tonnage rates are maximized and that the operator can meet the capacity goals efficiently. This benefits



both the operator and the customers by maintaining optimal productivity.

A fundamental aspect of the Telestack ethos is that each unit is fully constructed and operational before it is dispatched. This process involves a comprehensive factory acceptance visit with the customer and operators. During this visit, Telestack ensures that all parties are satisfied and that the scope of supply is clearly defined. Additional testing is conducted, and any necessary training is provided to the operators. This thorough preparation is crucial for a smooth installation and commissioning process, which in turn allows for quick and easy set-up times on site. The assembly and commissioning of this unit for Lanser Trio was done by the highly efficient technical service at VDS.

Lansers Trio is a leading expert in the storage, transfer, screening, and processing of dry bulk materials. Whether handling coal, ores, waste streams, or recyclable products, it provides tailored solutions for every application, utilizing the most suitable machinery and skilled personnel. The recent addition of the Telestack Titan W800 truck-unloader to its extensive equipment fleet, in collaboration with VDS, further enhances its capability to meet the diverse needs of their clients efficiently.

Telestack is renowned throughout the globe for its personalized service. The team of engineering and sales specialists work very closely with customers throughout each stage of the process from pre-sales and pre-engineering to ensure that the equipment is specific to your project. The company's product portfolio is vast as is its application knowledge. Experienced sales personnel will happily discuss projects with customers, and the company has a range of global reference sites in multiple applications.



Robust ultrasonic sensor meets the demands of mobile machinery

The increasing demand for efficient and safe automated systems and machinery is acknowledged by today's engineers and specifiers and applies to just about every industry sector. This includes some of the most demanding mobile machinery applications operating in construction, agriculture, materials handling and logistics applications - and also, of course, bulk handling stockyards. To meet these demands sensor specialist BAUMER continues to develop its range of high-tech smart sensors including options that withstand harsh outdoor conditions and are resilient to chemicals, dust, extreme temperatures and wet environments.

The latest addition to the Baumer range of award winning sensors is the UF401V an impressive, high-performing ultrasonic sensor with proven impermeability exceeding IP68/IP69K which Baumer claims is unique for an ultrasonic sensor. Another indication of the robustness and quality of the UF401V is that it is compliant to industry standards such as; ISO14982, EN13309, ISO13766, ISO5003 and EN60947-5-2/-5-7.

This innovative sensor is ideally suited



to the demands of machinery operating in harsh outdoor conditions, for example; agricultural, construction, bulk stockyards and other similar industries where working platforms and mobile machinery is essential. The non-contact ultrasonic sensing principle minimizes any wear and tear issues to ensure reliable operation at temperatures ranging from -25° to 70°C.

This easily integrated sensor provides reliable positioning and presence monitoring data, such as distance to ground, target position and distance and object detection. Most importantly the

option of the smart UF401F is capable of suppressing the transient effect of plants between itself and the targeted measurement data. This eliminates the concerns about potential interruptions in data collection whilst easing integration at control level.

The performance of the new UF401V sensor has been recognized by a respected European journal *OEM Off-Highway* which selected the sensor for a Top New Products Award, stating that it "represents innovation and ingenuity in product design and development."





sales@schadelagertechnik.com www.schadelagertechnik.com



SCHADE AUMUNDGROUP

ScrapeTec introduces its advanced dust suppression systems at MINExpo



ScrapeTec — in conjunction with distributors, BLT WORLD Inc — participated at the recent MINExpo, held recently in Las Vagas.

"This prestigious mining event — the world's largest mining show — is the perfect platform for players in the mining sector to network, showcase new products and share the latest technologies and trends in the industry," explains Thortsen Koth, ScrapeTec — manufacturers of advanced equipment, designed for the efficient control of dust and material spills during conveyor handling. "The ScrapeTec and BLT WORLD team was proud to participate at this interactive event and to introduce our advanced dust suppression equipment to mining specialists.

"Companies across the globe are continually looking for more efficient, dependable systems to alleviate problems associated with dust generation and belt spillage, caused by misalignment of conveyor belts. Common difficulties include dust, spills and contamination at the transfer points of conveyor systems. Misalignment, abrasion and subsequent belt damage are other problems industry faces.

"ScrapeTec dust suppression systems

have been developed to mitigate these dust-related issues and to reduce material spills, achieving significant cost savings, reduced energy consumption, improved environmental protection and a safer workplace. In addition to substantial operational efficiency, there is no longer the need for conventional dust collectors that demand high energy consumption.

"Apart from the benefit of cost savings and minimal energy consumption, DustScrape and AirScrape dust suppression systems are highly effective in minimizing exposure of workers to environmental pollution, which is a major problem caused by fugitive dust in dry bulk handling.

"ScrapeTec systems will go a long way to assist operators in the mining industry who need to prepare for the US Department of Labor Mine Safety and Health Administration's (MSHA) new silica dust regulations. The new silica rules will require aggregates, sand and gravel mine operators to conduct exposure monitoring for crystalline silica, dust sampling and medical surveillance.

"Although the compliance date for the rule is only in April 2026, we believe it is critical that operators begin preparations

now, so they are fully compliant when the new regulations become effective. Our highly experienced specialists offer dependable solutions for specific problems at the transfer points of conveyor systems in many industries, where dust and material spillage are concerns."

ADDITIONAL INFORMATION

ScrapeTec's AirScrape and TailScrape conveyor components control dust formation and stop material spill, which enables material control and minimizes the risk of explosion at transfer points along the conveyor route. The PrimeTracker belt tracking systems controls misalignment, thereby reducing abrasion and belt damage.

According to specialists, conventional dust control measures — which include side seals, covers, shrouds or enclosures around a dust source — do help to suppress dust generation and dispersal in the short-term, but many of these measures quickly wear-out as a result of friction and can damage the belt of the conveyor during extended periods of use.

There are substantial benefits when combining ScrapeTec's AirScrape, TailScrape

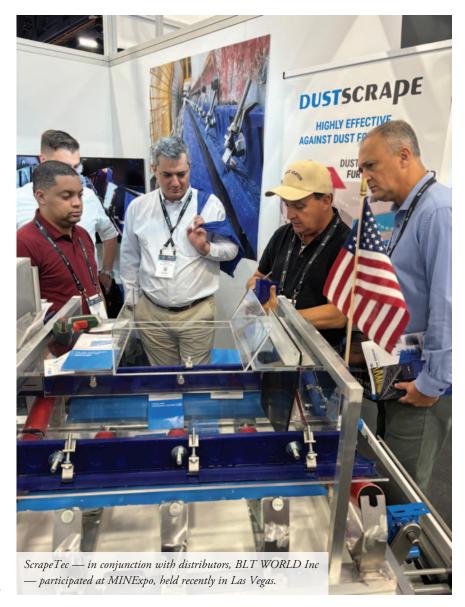
and PrimeTracker belt tracker on a conveyor system. The PrimeTracker ensures the belt is constantly in the correct position during operation, thus eliminating problems with belt mistracking, while the AirScrape and TailScrape efficiently control dust, prevent material spill and minimize explosion risks.

The contact-free AirScrape conveyor belt skirting system is an effective side seal that lies over the conveyor belt, without contact and creates negative pressure on the belt, due to its specially-designed blade structure. Because this system hovers freely above the conveyor belt, skirt friction and belt damage are eliminated and service life of every component of the conveyor is extended.

The AirScrape system encompasses inward facing, hardened-steel diagonal blades and operates according to a new principle where it hovers I–2mm, on the left and right side above the conveyor belt.

These blades deflect larger particles inwards, while using the air-flow of the conveyor belt and conveyed material to create an inward suction, forcing any dust and fine particles back into the product flow. Through these diagonally fitted plates and the speed of the running belt, air is drawn from the outside inwards. As a result, neither the dust nor material can escape.

Conventional skirting is pressed against a conveyor belt to keep dust and material in the middle of the belt, but after a period, wear of the skirting and belt can be so severe, that material and dust escapes. Material spillage at transfer points needs to be removed and regular maintenance of belt



skirting and transfer points is necessary.

With the AirScrape dust-free and contact-free, side-sealing system for belt

conveyors, there is no skirt contact and therefore no belt wear or damage. Motor power requirements are reduced, as there is no belt-skirt friction and because there is continuous skirting with no gaps, product loss is minimal.

The durable ScrapeTec system consists of non-flammable and anti-static polyurethane materials and blades made from Stainless Steel. This system is available in different grades of materials that are able to withstand operation in various temperature ranges, depending on the application. Options include standard, FRAS (Fire Retardant Anti-Static), FDA (Food and Drug Administration approved), CR (Chemical Resistance) and HT (High Temperature –135°C).

ScrapeTec specialists and the BLT WORLD team work closely to develop advanced solutions for conveyor systems used in the handling of all bulk materials, including grains, fertilizer, gypsum, cement and mineral ores. A technical advisory and support service enhances performance of every ScrapeTec system.



Stockyard systems from SAMMI around the globe

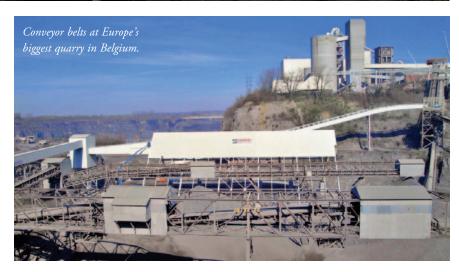


SAMMI s.r.l. specializes in the design and manufacturing of machines for bulk materials handling, providing complete systems and solutions in different fields, including bulk handling stockyards. SAMMI has shared some of its recent stockyard-related products with *Dry Cargo International*.

STOCKPILE POWER SUPPLY & QUARRY RAISING

Year: 2009–2011 Location: Belgium

Description: Solution for bulk materials, stockyard, belt conveyors, tripper cars: feasibility study, supply, erection and





commissioning for conveyor belts from the biggest quarry in Europe with a capacity of 2,500tph (tonnes per hour) of limestone of size up to 300mm and stock-pile capacity 50,000m³ feeding line.

Customer: C.C.B. Italcementi Group **End-user:** SA Compagnie Des Ciments

Belges C.C.B.

250TPH CONVEYOR SYSTEM TO FEED CEMENT CRUSHING MILL

Year: 2011-2012 Location: France

Description: Solution for bulk materials, stockyard, belt conveyors, spillage chain, hoppers, extractors: design, supply, erection, start up and commissioning of feeding system for coal mill. The aim of the project is to create storage areas for different products and extend the storage capacity up to 12,000m³. This installation meets the requirements of the Atex directives reducing dust emissions.

Customer: Ciments Calcia

End-user: Ciments Calcia — Usine de

Couvrot

RADIAL STACKER FOR MUCK/SPOIL REMOVAL STORAGE ON OPEN AREA AND BARGE LOADING SYSTEM

Year: 2014

Location: Hong Kong

Description: Radial stacker for muck/spoil



removal storage on open area and barge loading system: design and supply of one RS1400 x 26.75 tunneling muck radial stacker for stockpile and barge loading,

slurry muck conveyor with a capacity of 1,800tph, able to withstand typhoon wind limit 250km/h (storm-locked)

Customer: Marti Technics Ltd.





Efficiency in dry bulk handling: the role of conveyor belts in modern ports

Handling dry bulk cargo in ports is one of the most significant logistical challenges in the global supply chain. Every year, millions of tonnes of products such as coal, minerals, and grain pass through ports, requiring highly efficient and reliable systems to ensure a continuous flow of materials. In this context, storage yards play a crucial role as the collection and distribution point for cargo before it is transferred or dispatched. The solutions offered by GBS Colombia SAS, a major player in conveyor belt manufacturing, are essential for optimizing the operation of these yards, ensuring greater efficiency and profitability for ports.

One of the main challenges in bulk cargo handling is operational agility. The speed at which vessels are loaded and unloaded is critical, as each minute a ship remains in port incurs high costs and delays in the global logistics chain. GBS Colombia SAS specializes in designing and manufacturing conveyor belts capable of moving more than 30,000 tonnes of cargo per hour, which allows for faster vessel turnaround, significantly improving port efficiency. With their advanced technology, these conveyor belts not only speed up the loading and unloading process but also reduce downtime, resulting in higher revenues for ports and a more streamlined logistics chain.

In addition to capacity, another key factor is the reliability of the equipment. Conveyor belt failures during port operations can cause major disruptions, negatively impacting profitability. GBS belts are designed to operate under extreme conditions, both in terms of load and environmental factors, minimizing the risk of failures and ensuring continuous operation. This is particularly relevant in storage yards, where material flow must be constant to keep port operations running smoothly.

INNOVATION IN BULK CARGO HANDLING TECHNOLOGY

GBS Colombia SAS excels not only in the capacity of its equipment but also in its ability to innovate and adapt to the changing needs of the market. A notable example of this is the company's participation in a recent project in Africa, where it designed and helped structure a comprehensive system for the modernization and expansion of a bulk cargo port. This project included over 500 metres of conveyor belts, along with telestackers and feeders, optimized to handle cargo at more than 2,000 tonnes per hour. In addition, GBS designed an open-air storage system using silos and specialized conveyors, increasing the port's efficiency and improving its cargo-handling capacity.

One of the key innovations that GBS has implemented in its projects is the use of steel-cord conveyor belts and scanning systems that monitor the real-time condition of the belts. technology enables operators to identify potential issues before they develop major failures,

enhancing the durability of the equipment and minimizing downtime. Additionally, GBS conveyors feature sensors to measure temperature, humidity, and cargo weight, providing precise, real-time data to optimize port operations.

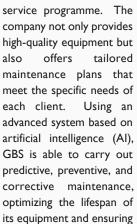
COMMITMENT TO SUSTAINABILITY

Sustainability is an increasingly important aspect of the cargo handling industry, and GBS Colombia SAS has taken a proactive role in this area. The disposal of used conveyor belts, which are mostly made from vulcanized rubber, poses a significant environmental challenge. To address this issue, GBS has developed strategies for recycling and reusing its thereby minimizing environmental impact of its products. Moreover, the company has adopted the use of eco-friendly adhesives in belt manufacturing. reducing the environmental footprint its production processes.

This approach to sustainability not only meets regulatory and market demands but also reflects GBS's commitment to developing technological solutions that are both efficient and environmentally friendly. This commitment is reinforced by its collaboration with CI Global Traders, a company within the group dedicated to the research and development of technologies aimed at reducing the carbon footprint of port operations.

HIGH-TECH MAINTENANCE AND AFTER- SALES SERVICE

Another key factor in GBS's success is its robust maintenance and after-sales



continuous operation in ports. The use of methodologies such as RCM (Reliability-Centred Maintenance) allows for maximizing operational efficiency and minimizing unplanned disruptions.

INTERNATIONAL EXPANSION

GBS Colombia SAS is undergoing significant international expansion, with the creation of Global Belting Solutions LLC in the United States, enabling it to take on global projects with greater capacity and flexibility. This expansion is complemented by ongoing technological innovation and the development of new sustainability solutions, positioning GBS as a leader in bulk cargo handling not only in Latin America but also globally.

In conclusion, the conveyor belts manufactured by GBS Colombia SAS are a key component in the operation of modern ports, improving efficiency in bulk cargo storage yards and ensuring reliable operations. With a focus on technological innovation, sustainability, and international expansion, GBS is well-positioned to retain its position in the bulk cargo handling market in the years to come

Innovative Weba transfer point solutions reduce costs and enhance safety

In the bulk material handling applications transfer points are critical locations where materials are moved between different conveyor belts or from conveyors to storage areas. The efficiency of these transfer points plays a pivotal role in maintaining a steady flow of materials, reducing downtime and minimizing operational costs. As these applications evolve, several significant trends are shaping the design and functionality of transfer points, reflecting a focus on reducing spillage, optimizing material flow and enhancing safety.

Weba Chute Systems has been at the forefront of addressing these evolving trends with its innovative approach to transfer point technology. The company's chutes are custom-engineered to ensure smooth material flow, reducing impact angles and directing materials in a controlled manner.

Mark Baller, CEO of Weba Chute Systems, explains that this design philosophy pioneered by his father, the late Werner Baller, minimizes wear and tear on both the chutes and downstream conveyor systems, significantly lowering downtime and maintenance costs.

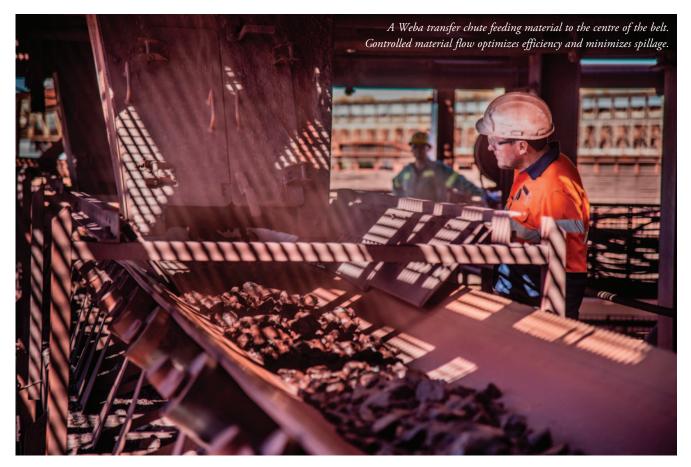
Reducing material spillage is a challenge that has driven innovation in transfer point technology. Spillage not only results in material loss but also increases maintenance and poses safety risks.

"We also incorporated advanced dust and spillage control features into our designs, and specifically the controlled flow









achieved by Weba chutes reduces turbulence and material scatter help to contain dust and minimize environmental and health risks," he says.

Safety is another critical area where Weba Chute Systems excels, with chute designs that provide easy access for

maintenance and robust safety barriers to protect workers. The integration of new technologies, such as sensors and remote monitoring systems, enables real-time data collection on chute performance, allowing operators to anticipate maintenance needs and avoid unexpected downtime.

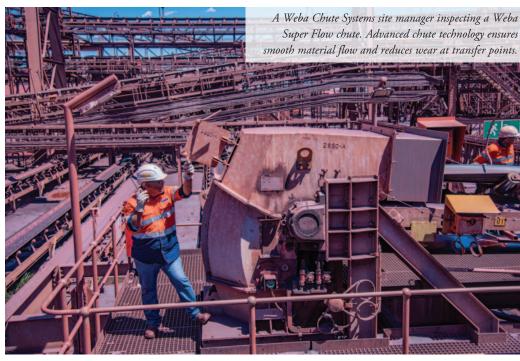
Baller explains that the use of advanced computational fluid dynamics (CFD) modelling, something which the company has been doing for many years, allows the company's engineers to simulate and analyse material flow at transfer points with great precision.



"By understanding how materials behave as they through these junctures, our engineers can identify potential problem areas, such as blockages or high wear zones, and adjust the design to ensure smoother, more controlled flow. This approach helps to reduce impact and abrasion, extending the lifespan of the equipment and minimizing maintenance requirements," Baller continues.

Material choice is also a critical factor, with a growing emphasis on wear resistant materials that can withstand the harsh

conditions typical of bulk material handling environments. High quality abrasion resistant steel, ceramic liners and composite materials are increasingly being used to line chutes and other components exposed to high impact or abrasive materials. These materials not only



enhance the durability of the equipment but also reduce downtime due to less frequent repairs or replacements.

As the demand for more efficient, durable and safe transfer point solutions continues to grow, companies like Weba Chute Systems are well-positioned to meet these evolving requirements. By continuing to set new standards for performance and longevity, Weba Chute Systems is ensuring that material handling operations run smoothly and efficiently, maximizing productivity and reducing costs for bulk materials handling operations.

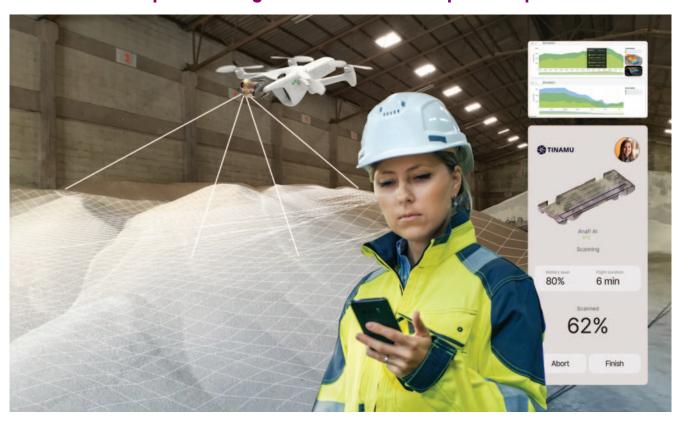
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Tinamu AI stockpile offering continues to develop and expand



In the world of ports and terminal operations, Tinamu is making waves as an innovative player, pioneering the realm of robotics and Al-powered stockpile volumetric measurements.

A spin-off from the Swiss Federal Institute of Technology (ETH), Tinamu has introduced a ground-breaking automation workflow that is changing how industries monitor stockpile inventory.

Traditionally, stockpile volume measurement was a painstaking and errorprone manual task that often struggled to keep up with the fast-paced dynamics of the industry. The intricate process of handling cargo in ports and terminals necessitates numerous stages, from sampling and preparation to weighing and final verification — all prone to inaccuracies and inefficiencies.

Keeping accurate and up-to-date inventory records of dry bulk is a daily challenge. Weighbridges, conveyor scales, draught surveys, and the rest of the existing solutions have their limitations and rarely deal effectively with the dynamics of ports, terminals, and warehouse operations. Inspections cannot be done multiple times a week, nor can regular human-piloted drones, as both have a high incurred cost and long turnaround to provide results. As a result, recency and confidence about the inventory are low and lead to logistic and operational inefficiencies. And the lack of visibility leaves room for fraud.

Tinamu's game-changing solution is an Al-powered autonomous drone system that captures high-resolution images of

stockpiles, analyses the data, and delivers precise volumetric measurements in a matter of hours. This creates a much-







needed breath of fresh air in ports and terminals, especially where fraud detection and rapid, accurate inventory management are paramount.

Tinamu's technology combines autonomous drone navigation, cloud-based and Al-driven data processing, and a user-friendly platform to deliver periodic volume measurements of stockpiles with below-centimetre precision. As the drones gather data, it is uploaded to the cloud, processed with Al, and then returned to the user within a few hours via a web interface and visualized in easily digestible dashboards.

These interfaces enable tracking of changes in material distribution, analysis of inventory trends over time, and provision of detailed inventory data for each stockpile that's been surveyed, enhancing monitoring and logistics planning and maximizing warehouse utilization.

This innovative solution expands the limitations of traditional bulk inventory technology, like weighbridges and conveyor belts, and resolves issues associated with fixed sensors, including fine dust and blind spots. And critical for ports and terminals, this technology also amplifies fraud detection capabilities, enabling early identification and resolution of discrepancies.

Where traditional methods take days, Tinamu's system reduces this to mere hours. The platform ensures that from the moment the drones take flight, the collected data is swiftly processed and delivered to the client, maximizing efficiency and reducing waiting time.

Marco Rodzynek, the founder of NOAH

Conference, praises Tinamu's fully automated solution as "more flexible and up to 90% more cost-efficient than traditional methods." The company claims the ease of use, fast data turnaround, and increased accuracy of Tinamu's automated processes provide improved 24/7 visibility for end-to-end automated monitoring and control over warehouse inventories, offering reliable and precise measurements at the push of a button without the need for a pilot.

Already validated by leading players in the mining industry, Tinamu's technology is also making significant inroads across various other sectors — including chemicals, construction, and agriculture that handle dry cargo, thus transforming the landscape of port and terminal operations. For instance, companies dealing with various bulk goods can leverage Tinamu's solution to streamline their inventory management, enhance logistics planning, and increase operational efficiency. And financed cargo under a collateral management agreement in remote areas can benefit from secure, trusted measurements for early fraud detection and operational verification.

A case in point is KIBAG, a large Swiss building materials group. KIBAG is highly dependent on reliable stock levels and needs to constantly monitor how much free space it has and how much inventory is available for sale. But like many in the industry, it was estimating these stockpile volumes visually, and the reporting was done in Excel. Because of the lack of accuracy, there were issues in planning and

co-ordination that made the system totally unreliable.

Incorporating Tinamu's solutions into its operations led to a radical improvement in stockpile measurements and a significant boost in operational efficiency that built trust back into the system with technology. "We push a button, the drone automatically flies indoors, outdoors and we get real-time stock data," says Urs Ficher, Site Manager at KIBAG. "Now that we use Tinamu's solution, I can't imagine our operations without it."

Not only does Tinamu's technology deliver efficiency and accuracy, but it also contributes to a more sustainable world. By automating the process, human error, waste, and carbon emissions are significantly reduced, leading to better utilization of resources and safer inspection methods.

In 2023, Tinamu entered a technological partnership with globally recognized European drone manufacturer Parrot. The synergistic partnership provides a software layer to transform Parrot's hardware into autonomous, self-navigating drones capable of operating in challenging indoor environments and has further amplified the scope and impact of Tinamu's solutions.

The ANAFI Ai's robust features such as 4G connectivity, reliable indoor mission execution, and obstacle avoidance fit perfectly with Tinamu's needs. However, intensive testing of Analfi or the first Al versions has revealed that the units are not yet sufficiently able to cope in the rough and dusty industrial environments in which Tinamu works. Nonetheless, Tinamu is still

working with the Parrot Bebop 2 platform from 2012, while it is constantly getting access and assessing any of Parrot's latest platforms before they are even announced to the markets. This all unlocks new possibilities for service delivery.

Tinamu's proficiency in indoor autonomous flight sets it apart from the competition, and Tinamu's automation workflow now enables Parrot's drones to provide reliable and precise measurements at the push of a button without the need for a pilot.

Tinamu anticipates improvement in service delivery, enhancing safety, speed, and accuracy, which will substantially improve their customers' experience. Chris Roberts, VP and Chief Sales & Marketing Officer of Parrot, also echoes these sentiments, marking the automation of drones as the future for scaling professional drone usage.

Another crucial aspect of this partnership is its adherence to the highest cybersecurity standards. The ANAFI Ai drone is compliant with the European Union General Data Protection Regulation (GDPR), includes a Secure Element to protect the embedded software, provides for strong authentication, and supplies a digital image signature. This strong focus on data privacy makes it an optimal choice for Tinamu, especially considering the sensitive nature of warehouse inventory data.

RECENT DEVELOPMENTS

- Tinamu has won and just onboarded a global leading copper producer in Germany, doubling its recurring service fee for data as a service. Tinamu offers recurring inventory monitoring on several warehouses and sites.
- Tinamu has established its data as single source of truth with a new standard inventory procedure, starting with its data and only doing manually inspections where necessary to clarify gaps to internal data.
- Tinamu has been able to reconcile exact densities, showing substantial differences from effective to the ones measured by standardized sampling and laboratory tests.
- Tinamu has also now initiated discussions to roll out its solution to more warehouses and sites — the name of the client remains confidential at this stage.
- In late October, Tinamu won the first Commodities Technology Innovation Award from Bilan and Ampersand World recognizing its transformative





- impact on the commodities sector.
- Tinamu has also been officially certified by InnoSuisse as ready for scalable growth as successful finish of the core coaching.
- Tinamu has onboarded a new customer producing graphite and carbon in Switzerland, where it does recurring monthly inventory spot inspection. Already at the first

inspection, Tinamu identified up to 50% error on internal data.

- In corporate terms, the company has been reset to get ready for scale. Thomas Götschmann joined Tinamu on I May as the new CEO, to lead scale-up together with Tobias Nägeli, now in charge of Product and Technology.
- Tinamu initiated growth to serve its customers globally, currently planning pilots in Mozambique, Australia and Chile/Latin America.
- Tinamu is expanding its services to offer more insight beyond accurate volumes towards production excellence support (full material flow transparency, enabling planning

certainty and lean logistics).

PLANS FOR THE FUTURE

With an operational footprint in several European countries, including Switzerland, Belgium, France and Germany, Tinamu is rapidly expanding its reach. The company is continually enhancing its platform, keeping it ready for technological advancements and adapting to the industry's changing needs.

It plans to continue its journey to breakeven and to reach the crucial, emotional CHF I million annual recurring revenue milestone, assuring successful sales traction, by the end of 2025

Tinamu is successfully funded until Q3 2025 and is preparing for a growth

acceleration series-A in 2026. It is searching for a strategic investor to lead global acceleration and the expansion of its vision to build a platform of flexible sensors.

Tinamu's future plans include adding additional sensors to its platform, such as thermal imaging, further adding value to indoor inventory monitoring. By having drones fly autonomously and repeatedly monitor the temperature of stockpiles, Tinamu should be able to provide early detection of moisture in grains and self-combustion in coal.

By creating a new way of doing periodic stockpile monitoring, Tinamu is reinventing the standard for innovation in ports, terminals, and beyond.



Thank you

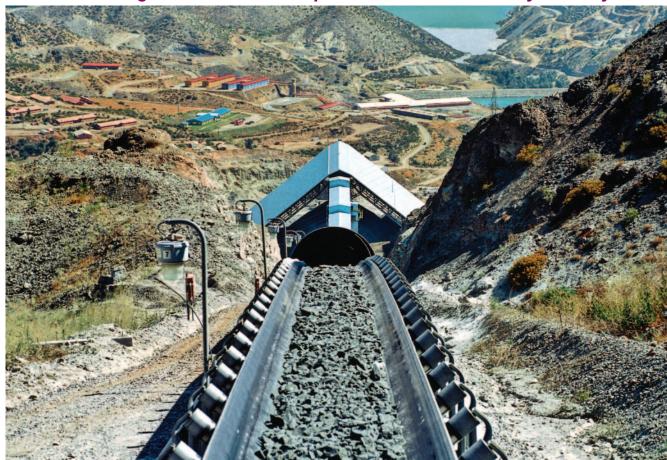
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Innomotics' DigiMine Yardmaster proves its worth in today's stockyards



Stockyard equipment is just one aspect of the many products made by Innomotics. The company manufactures and supplies a wide range of products, services and solutions for many industries, including oil & gas, water, mining, cement and carmaking.

With regards to dry bulk stockyards, Innomotics' electric motors and large drive systems are deployed in conveyor systems, mine winders, transportation infrastructure and bulk material handling machines.

Additionally, Innomotics supplies leading solutions in Digitalization, Automation and Electrification which allow companies to operate their existing assets as efficiently and sustainably as possible.

These include the DigiMine YardMaster, Innomotics' stockyard management solution. Yardmaster is designed to provide operators and planners with extensive knowledge about their stockyard inventory in real-time so that they can make the best decisions possible.

DigiMine Yardmaster also incorporates the Advanced Stockyard Planning (ASP) application which uses algorithms and realtime data integration to advice planners on how to schedule and optimize the movement of bulk materials in order to achieve defined production targets.

The DigiMine Yardmaster solution is

configured to handle any kind of dry bulk material, including copper concentrates, iron ore, coal and lime stone.

The DigiMine Yardmaster is the result of two decades of experience in developing automated stockyards. Innomotics designed the world's first driverless material handling system at the Bexbach power plant in Saarland, Germany.

So far, Innomotics has automated around 60 machines across Europe, Africa, and Asia with its Yardmaster solution. Over the last decades, it has deployed the technology at steel plants in China and Italy, phosphate mines in Morocco and a coal mine in South Africa.

Innomotics is redefining reliable motion for a better tomorrow, which will help it to remain competitive in a tight market. The company's solutions are highly efficient, dependable, low-maintenance, sustainable and digital.

Furthermore, excellent service is a top priority for Innomotics.

That is why Innomotics works very closely with its customers to conceive, design and implement solutions that meet their needs as closely as possible in a way that impacts their bottom line and the environmental profile of their operations.

Innomotics is constantly developing and refining its solutions, and keeps up with the latest developments in technology. solutions in Digitization and Automation offer major efficiency improvements in the handling of bulk materials.

Additionally, electrified and gearless direct-drive systems can significantly reduce maintenance costs and downtime as well as CO₂ emissions.

ABOUT INNOMOTICS

Innomotics GmbH is a globally renowned provider of electric motors and large drive systems that combines deep technical expertise and leading innovation in electrical solutions across industries and

With its more than 150 years of experience in developing electric motors, the company is the backbone for reliable drive technology in industry and infrastructure worldwide.

Innomotics is a thought leader in the areas of industrial efficiency, electrification, sustainability, and digitalization. company is headquartered in Nuremberg (Germany) and employs around 15,000 people worldwide. Annual revenue exceeds €3 billion. With 17 production sites and a comprehensive sales and service network in 49 countries, Innomotics has a balanced global presence in a growing market.

Italian pedigree gives Meccanica Center the edge in machining



Meccanica Center (MC), based in Italy, offers a range of on-demand machine services and products, many of which are in use in today's bulk handling stockyards.

All products are 100% tailor made in Italy. The range includes a wide range of crane components: wheels, pulleys, drums, guide rollers, hook blocks, bogies and gearboxes. As a part of the Tonoli Group, MC boasts a history spanning three generations, during which the Tonoli family has played an active role in the Italian industrial community. In business for 45 years, MC has had many successes, and has shown commitment and an ability to overcome challenges; this approach has made Tonoli the esteemed company it is today. MC is a modern organization guided by principles and values. It is a strategic partner in the steel, ports and railways sectors, as well as in crane manufacturers one.

The company's flagship product, its 'FIRMA' wheel, is a tangible example of MC's key principles: "Quality, Technology, Efficiency". Years of research, dedication and improvement have been dedicated to creating the ideal component for the main which applications translate maximum efficiency, safety, appreciable savings in maintenance and plant downtime. DCi



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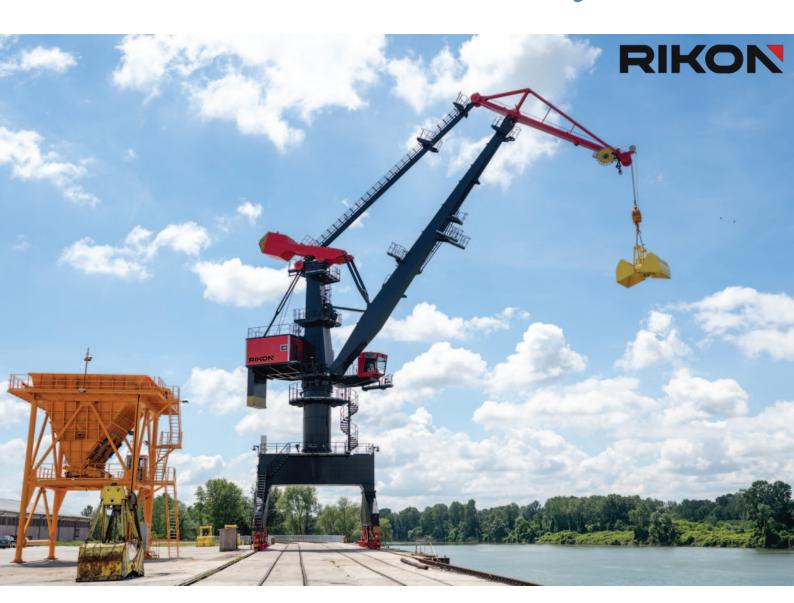
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E: susanky@chs5e.com W: www.ckic.net

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Polígono Industrial El Sotillo S/N La Puebla de Cazalla 41540 Spain Contact: Mr Álvaro Páez Job Title: Purchasing and

Marketing Department T: + 34 695 402 000 E: alvaro@espirales.es W: https://espirales.es/

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Hilden 40721 Germany Contact: Mr Ronald Salzmann T: +49 21 03 951 882 F: +49 21 03 951 839 E: info@coal-control.de
W: http://www.coal-control.com

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KZN
4023
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Dalian
Liaoning
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Contact: Mr Wenliang Lan Job Title: Deputy General Manager T: + 86 1355915570 F: + 86 13555915570

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De Regt Conveyor Systems

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Riervliet

Zeeland
4521 GX
The Netherlands
Contact: Mr Peter De Regt
Job Title: Director
T: + 31 115 456 200
F: + 31 115 481 234
E: peter@deregt.com
W: www.deregt.com
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Kirchen-Wehbach
RLP
57548
Germany
Job Title: Marketing
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E: kateryna.prykhodko@
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Malvern
Pennsylvania
19355
USA
Contact: Mr Matt Delpizzo
Job Title: VP
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W: www.demagcranes.com DEMARCO INDUSTRIAL VACUUM CORPORATION

PO Box 1138 Crystal Lake IL 60039-1138 USA Contact: Mr Th

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Contact: Mr Thomas DeMarco
Job Title: President
T: + 1 815 344 2222
E: Sales@DeMarcoVacuums.com
W: www.DeMarcoVacuums.com
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Contact: Mr Paul van de Vyver Job Title: General Manager T: + 27 11 608 4355 F: + 27 11 608 4251 E: info@DemcoTECH.com W: www.DemcoTECH.com DemcoTECH, a multi disciplinary Engineering and ulscipiniary 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.

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Christiaan Huygensweg 2 Hellevoetsluis Zuid Holland 3225 I D The Netherlands Contact: Mr J.A.A. den Bakker Job Title: CEO T: + 31 181 399 632 E: j.d.bakker@denbakker.nl W: www.dbdglobal.com 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 Dustdruster is an oetter frain 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.

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Marieneher Strasse 17 MV18069 Germany
Contact: Mr Andreas Wiedenhoeft

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DISAB VACUUM TECHNOLOGY AB

Åkermans väg 24 Box 170 Eslöv 241 23 Contact: Mr Hampus Patronen Job Title: Marketing Coordinator T: + 46 413 55 43 14 E: hampus.patronen@disab.com **W**: www.disab.com DISAB is on the forefront when it comes to vacuum technology and how to apply it in various industrial settings to keep dust, dirt, and spillages away.

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Idaho Falls ID 83401 USA Contact: Miss Rebecca Pyper Job Title: Marketing Director T: + 1 208 569 8557 E: rebecca.pvper@ 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.

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Doncaster **DN3 10R** UK Contact: Mr Roger Allen Job Title: Managing Director T: + 44 1302 881188 F: + 44 1302 881000 E: sales@donvalleyeng.com W: www.donvalleyeng.com

DONALDSON EUROPE

Interleuvenlaan 1 Leuven B-3001 Belgium Contact: Mr Michel Reichert Job Title: Head of Marketing -Industrial Solutions EMEA

Research Park Building No. 1303

T: +32 16 38 38 11 E: Michel.Reichert@ Donaldson.com

W: www.donaldson.com/en-be/

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E: dfmh@durofelguera.com OR angel.pelegry@durofelguera.com anget-pelegy/gountelgueta.com/en/
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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 masterplanning, Construction planning and Engineering and consulting, environmental studies, project management.

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Via Tondelli n°10 Bagnolo in Piano (RE) Italy
Contact: Mrs Valentina Magnani Job Title: Marketing T: + 39 0522 956001

EMG AUTOMATION GMBH

F: + 39 0522 951851

elettrotekkabel.com

E: valentina.magnani@

W: www.elettrotekkabel.com/

Industriestraße 1 Wenden D-57482 Germany
Contact: Mr Uwe Wurster Job Title: Head of Business Unit Drive Solutions T: + 49 27 62/6 12 322 F: + 49 27 62/6 12 237 E: Uwe.wurster@ emg-automation.com W: https://www.emg-automation.com/en/

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Contact: Ms Monika Zipperle Job Title: Marketing Manager T: + 39 0471 089 100 F: + 39 0471 089 110 E: Monika.Zipperle@ emicontrols.com W: https://www.emicontrols.com/

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Ontario K8N 4Z2 Canada Contact: Mr Kyle Sorensen Job Title: Director, Business Development, Marine System Sales T: + 1 613 966 6611 F: + 1 613 966 6710

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ENBL (Kunshan) Machinery Co. Ltd No. 235 Weijing Road

Qiandeng Town Suzhou Kunshan City Jiangsu 215343 China Contact: Mr Lewis Xu **Job Title:** Sales Manger **T:** + 86158 5029 9769 E: sales@enbl-grabs.com W: https://www.enbl-grabs.com/ w: https://www.enub-graus.com/ ENBL (established in November 2013) is located in the Yangtze River Economic Friendly Frontier - Kunshan along the Shanghai industry. It is the biggest professional grab manufacturer in China. Through resource integration and professionals in the field, the company has a manufacturing advantage and offers services such as design, manufacture, sales and technical support

ENDURIDE

1880 Provinciale Street, Quebec G1N 4A2 Canada Contact: Mr Roberto Patino
Job Title: Chief Executive Officer T: + 1 418 266 7777 E: sales@enduride.com W: https://www.enduride.com/

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ENGINEERING SERVICES HAMBURG

Brünschentwiete 58 c Hamburg 22559 Germany Contact: Mr Mario Rämmele Job Title: CFO T: + 49 172 414 38 36 E: rm@engservhamburg.com W: www.engservhamburg.com

Engineering System SOLUTIONS, ES2

4943 N 29th E Idaho Falls ID 83401 USA Contact: Mr Adam Aagard Job Title: Project Manager T: + 1 208 552 9874 E: adam.aagard@es2eng.com W: https://www.es2eng.com

EPN SOLUTIONS Karl Grankvist 1C Piteå SE-941 52 Sweden
Contact: Mr Mattias Öman Job Title: Managing Director T: + 46 70 371 15 30 E: mattias.oman@epnsolutions.se
W: http://epnsolutions.se/

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P.O.Box: 64624 DEIRA Dubai 64624 UAE Contact: Mr Dharmaraiu Sundaram

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ESI Eurosilo BV

Newtonstraat 26-28 Purmerend 1446 VR 1440 VK
The Netherlands
Contact: Mr Richard Spaargaren
Job Title: Commercial Director
T: + 31 299 630 730 F: + 31 299 630 737 E: sales@eurosilo.com W: www.eurosilo.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

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Contact: Mr Michael Hellmers Job Title: Chief Sales Strategist T: + 1 951 739 7000 E: info@eslpwr.com W: https://eslpwr.com/

EUROMEC S.R.L.

Via Visano 78/80 Isorella 25010 Italy Contact: Mr Alessandro Gervasio Job Title: Head of Sales and Coowner T: + 39 3911297003

E: gervasio@euromecsrl.it
W: https://euromecsrl.it/

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Spacelab 47 D Amersfoort 3824MR The Netherlands Contact: Mr Hans Plekkenpol T: + 31 33 4567033 F: + 31 33 4558149 E: sales@tramco-europe.com W: www.tramcoinc.com
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FAIRPORT ENGINEERING

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ul. Fabryczna 5 Kluczbork PL 46-200 Poland Contact: Mr Robert Rulkiewicz
Job Title: Chairman of the board
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F: + 48 77 418 15 45 E: famak@famak.com.pl W: www.famak.pl Over 60 years experience as manufacturers of transportmanufacturers of transport-hoisting equipment. Highly qualified technical engineering staff have interdisciplinary knowledge and experience and design-development base, implementing the highest technical level of offered products. Products designed according to individual needs and installed on-site. Full service after installation. service after installation.

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Oliemolenstraat 2 PO Box 14 Drachten

9200 AA The Netherlands Contact: Mr Andries Smilda Job Title: Sales & Marketing Director

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FENNER DUNLOP **AMERICAS**

200 Corporate Center Drive Suite 220 Coraopolis PA 15108 USA Contact: Mr Chris King Job Title: National Sales Director T: + 1 307 670 3361

E: chris.king@fennerdunlop.com W: www.fennerdunlopamericas.com

FENNER DUNLOP Conveyor Belting **EUROPE**

Hull Yorkshire HU9 5RA UK

Contact: Mr Jim Jones Job Title: Managing Director T: + 44 1482 785450 F: + 44 1482 785438 E: jim.jones@fennerdunlop.com E: jm.jones@tennerdunlop.com W: www.fennerdunlop.com Fire-resistant, solid-woven conveyor belting, with rubber or PVC covers, is manufactured to all major national safety standards. Supplied to all major underground materials handling and extraction industries and to other coal handling onergings other coal handling operations where safety and economy are major criteria.

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FLENDER GMBH Alfred Flender Strasse 77

FLE ST&MK

Bocholt D- 46395 Germany Contact: Mr Hans-Jürgen Thebert Job Title: Marketing T: + 49 172 5886250 / + 49 2871 920 E: hans-juergen.thebert@ flender.com W: www.flender.com

2525 Wisconsin Avenue Downers Grove 60515-4200 USA Contact: Ms Kelly Clancy Job Title: Public Relations Specialist T: + 1 630 971 0150 F: + 1 630 971 1180 E: kclancy@flexco.com W: www.flexco.com Flexco, a manufacturer of

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FLEXCO EUROPE GMBH

Maybachstraße 9 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

18020-8006 Contact: Mr Dan Canwell Job Title: Senior Advertising Specialist T: + 1 610 814 2400 x10611

F: + 1 610 814 0600 E: sales@flexicon.com

W: https://www.flexicon.com/

FLEXOVEYOR CONVEYOR 3795 Paris St., Unit D

Denver Colorado USA Contact: Mr Bill Priday T: + 1 303 375 0200 F: + 1 303 373 5149 E: billpriday@flexoveyor.com
W: www.flexoveyor.com

FOGCO SYSTEMS, INC.

600 South 56th Street Chandler ΑZ 85226 USA Contact: Mr Dana Pack Job Title: Vice President Sales T: + 1 800 607 6478 E: danap@fogco.com W: https://fogco.com/

FRIGATE TEKNOLOGIES PRIVATE LIMITED

A-1550, 2nd Floor Green Field Colony Faridabad Harvana 121 003 India

Contact: Mr Ajay Hooda T: + 91 129 2511662 F: + 91 1166173981 W: www.frigate.in

FWS GROUP

275 Commerce Winnipeg Manitoba R3P1R3 Canada Contact: Mr Martin Bima Job Title: Engineer T: + 1 204 223 8542 E: mbima@fwsgroup.com W: fwsgroup.com

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
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Via del Brennero, 316 Trento Trento 38121 Italy

Contact: Mr Davide Gambarotta

Job Title: CEO T: + 39 0461 920 403 T: + 39 0461 920 403
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W: https://www.gambarotta.it
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Vadász utca 47. Tatabánya 2800 Hungary Contact: Mr Attila Sasvari Job Title: Senior Naval Architect T: +36 70 528 8751

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Geo - Chem House 294 Shahid Bhagat Singh Road, Mumbai Maharastra 400 001 India Contact: Mr Subhashis

Chakraborty

Job Title: Director Minerals &

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W: www.gruponavec.com

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Gurtecstrasse 3 Schöppenstedt Germany Contact: Mr Peter Abromeit Job Title: Sales Manager International T: + 49 151 15446300 E: Peter.Abromeit@Gurtec.com W: https://gurtec.com/

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Alfredstraße 28 Nordrhein-Westfalen 45130 Germany Contact: Mr Matthias Goeing
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Eichwiesenring 11 Stuttgart 70567 Germany Contact: Mr David Sasko Job Title: CEO T: + 49 711 725 89-0 F: + 49 711 725 89-50 E: david.sasko@hauk-sasko.de

W: http://www.hauk-sasko.de/en/

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Kruisweg 643 Hoofddorp 2132 NC The Netherlands Contact: Mr Mattijs Faber Job Title: Business Development Manager T: +31 20 6556385 T: +31 20 6556385
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Vogelweiherstr. 1 – 15 Nuremberg 90441 Contact: Ms Julia Ebenberger Job Title: Communications T: + 49 911 958 0 E: julia.ebenberger@ innomotics.com
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W: www.doubrava.at

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Mülheim an der Ruhr

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QianQiao Street

HuiShan District

Wuxi City JiangSu China Contact: Miss Alice Chen
Job Title: Sales Department Manager T: + 86 510 8321 2288 E: marketing@qshi-china.com

W: https://www.gshi-cn.com/

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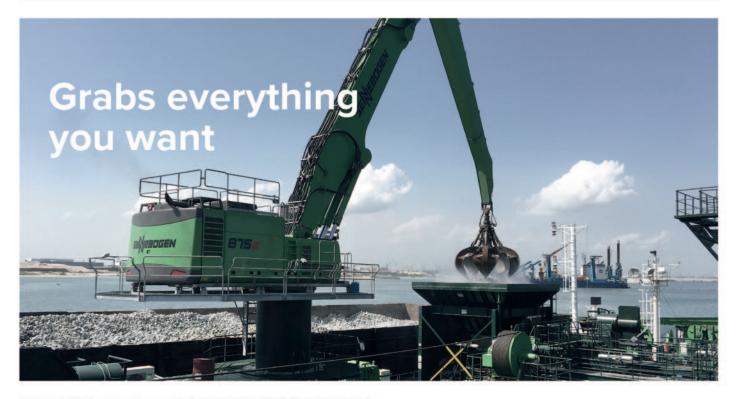
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Contact: Ms Morgan Murphy Job Title: Marketing Manager T: + 1 330 456 3121 F: + 1 330 456 3247

E: Morgan.Murphy@ midwestind.com

W: www.midwestind.com
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Contact: Mr Walter Pair
Job Title: President and CEO T: + 1 231 547 4000 F: + 1 231 547 9453

E: sales@

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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 SERVICES PTY LTD

631 Uhlmann Rd Burpengary QLD 4505 Australia
Contact: Mr Steve Valpreda

Job Title: Business Development Manager T: + 61 1300 665 409

E: steve.v@ mobileconveyors.com.au

W: www.mobileconveyors.com.au

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2nd Floor 93 Southwark Street London SE1 0HX

Contact: Ms Karen Levy Job Title: Business Development

Management T: + 44 1252 516 398 E: klevy@moffattnichol.com W: www.moffattnichol.com

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27815 State Route 7

Marietta Ohio 45750 USA Contact: Mr Michael Bailey
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10 Sangiorgio Court

Perth WA 6017 Australia
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Newtonstraat 17 Heerhugowaard 1704 SB The Netherlands Contact: Mr Steven Beukers Job Title: Marketing & Communication

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Houston 77240-0563 USA Contact: Ms Ann Hutchinson T: + 1 832 467 3636 F: + 1 832 467 3800 E: ben@navco.us

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Voorhavenlaan 14B Ghent B-9000 Belgium Contact: Mr. Josie Peiffer **Job Title:** Head of Supervision **T**: + 32 9 345 89 77 W: https://navonus.be/

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Castelfranco Emilia Modena 41013 Italy
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W: www.noellchina.com

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Co., LTD. No.16 Kaifa Road Shenyang Economic & Technological Dvpt Zone Shenyang 110141 China Contact: Mr John Lee Job Title: Marketing Director E: project@nhisales.com W: https://nhisales.com/

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6163 Australia Contact: Mr Gerry McGuigan Job Title: Sales Manager Sales Manager T: +61405819035

E: gerry@opsaust.com.au W: https://opsaust.com.au/

ORTHOS PROJECTS

Fernie Road Market Harborough Leicestershire LE16 7PH UK Contact: Mr Nick Hall

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W: www.overlandconveyor.com/

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Pulogadung Trade Centre, Block Jl. Raya Bekasi Km 21 Kawasan Industri Jakarta 13930

Indonesia Contact: Ms Mina Hermina Job Title: Marketing Manager T: + 62 21 4680 1210 F: + 62 21 4680 0716 E: mina@mitrask.com
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Linker Kreuthweg 9 Affing-Mühlhausen D-86444 Germany Contact: Ms Susanne Geller-Dürr Job Title: Marketing and Sales Manager T: + 49 82 07 9 58 99 28 I: + 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

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Franse Akker 1 Breda 4824 AL The Netherlands Contact: Mrs Monique Kuijer-Job Title: Communication &

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Indonesia Contact: Mr Frans Martin Hasiholan Job Title: Manager T: + 62 817 609 8883 F: + 62 21 2525 928 E: frans.hasiholan@

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W: www.ark-transshipment.com

PT Asian Bulk LOGISTICS

Menara Karya 20th floor Unit D JL HR Rasuna Said Block X-5 Kav 1-2 Jakarta 12050 Indonesia Contact: Mr Anant Bahl Job Title: General Manager

T: + 62 21 5785 1960 F: + 62 21 5785 1959

W: https://abl.co.id/

PT BOMA BISMA INDRA JL. KHM Mansyur No. 229

Surabaya

East iava 60162 Indonesia Contact: Mr Sandy Gitu Loh Job Title: Engineer T: + 62 89637776242

E: sandygituloh22@gmail.com

W: www.ptbbi.co.id

PT BUKAKA TEKNIK Jl. Raya Bekasi Narogong 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

PT CARSURIN

E: bdv@bukaka.com

W: www.bukaka.com

Neo Soho Capital Lt. 28 JI Letien S. Parman Kay 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

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Wisma JPC Jl. Mampang Prapatan Raya No. 20 Jakarta 12760 Contact: Mr Tony Haryono Job Title: Branch Manager T: + 62 21 8794 4010 E: tonydio@jpc.co.id

W: www.jpc.co.id

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Gedung Menara Karya JI HR Řasuna Said Jakarta South Jakarta 12950 Indonesia
Contact: Mr Immanuel Sinulingga Job Title: GM Commercial T: + 62 811800685 E: corporate.communication@ mbss.co.id W: www.mbss.co.id

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Menara Karya 12th Floor JI H R Rasuna Said Block X-5 Kav 1-2 Kuningan Jakarta 12950 Indonesia Contact: Mr Yogi Saputra

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W: www.thiess.co.id

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Sidoarjo Fast Java 6135 Indonesia Contact: Mr Mochamad Robby

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gmail.com
W: www.lelangon.com

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F: + 86 532 8251 9238
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21, Center Point
Indira Gandhi Road
Jamnagar
Gujarat
361008
India
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W: https://suprememfg.net/

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3609 North 16th Street Parsons Kansas KS 67357 USA Contact: Mr Gino Gebelin Job Title: Marketing Supervisor

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Job Title: Sales & Marketing
Manager
T: + 61 3 9541 8699
E: paul.gaskett@
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UK
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F: + 45 56314925
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W: www.techNaero.dk
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Unit 5 16 Rob Place Vineyard NSW 2765 Australia Contact: Mr Patrick Cooper



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Imperial Conveying Systems	V						V	V	V	V	V	V		V		V		V			V					V	V		V	
Impro Solutions Inc																														
Incolab Services BV indurad - The Industrial Radar	Com	nanv	,					,	,					_	V	,		V	~	,	V V	V			_		.,	V	,	
indurad GmbH	COIII	party	-			V				~	V	V	V	V	V	V	V	V	V	V	V			V		V	V		V	
Inenco SAC																														
Innomotics GmbH INOCON Industrial Plants						1								~																
Instral B.V.																							V							
Intermodal Solutions Group Intermodal Solutions Pty Ltd																												~		V
International Crane Factory																														
iSAM AG Gesellschaft fuer angewandte Kybernetik	~	~	~	~	~	~	~	~			~	~	~							~	~			~		~	~		~	
ISKAR Mühendislik Ltd	V	V	V	V						V	V			V		V	V												V	
Isomonte SA	V	V			~						~																			
Italgru S.r.l J & B Grijpers b.v.					V																									
Jacobs	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V						V	V	V	V	V		V	
James A. Redding Company Jansen & Heuning																														
Jenike & Johanson Inc.	V	V			V						V	V		V		V	V	V	V	V			V		V		V	V	V	V
JFE Engineering Corporation Jiangsu QunShuo Heavy																														
Industry Equipment Co																														
Jiangsu Rainbow Heavy																														
Industries Co., Ltd. Jiangsu ZDPM																														
Manufacturer Co.,Ltd																														
Jimway Enterprise Co., Ltd Johannes Hübner Fabrik	V	~	~	~		~	~	V	V	~	~	~	~	~			~	V								~	~			
Elektrischer Maschinen GmbH	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V		V	
Joy Global Inc																														
Kalenborn Kalprotect GmbH & Co. KG	V	V				V			V	V	V		V	V		V		V	V							V	V		V	V
KenzFigee Group B.V.	V	V	V	V			V	V								V							V				V			V
Kiepe Electric GmbH Kilic Engineering														V										V						V
Kinder Australia Pty Ltd														V									V						V	V
Kingfisher Industrial Ltd KINSHOFER GmbH	V	V			V	~			V					~		~	V	V	V					V		~	V			V
Kiruna Wagon AB																											•			
Kleemann GmbH														V				V									V			
Knight Industrial Equipment KOCH Solutions GmbH	V	V		V		V	V	V		V	V	V	V	V		V		V	V	V	V		V	V	V	V	V			
Komatsu Mining Corp. Group										~	~	V	V	V	V	~		V												
Konecranes (France) Konecranes Finland	~	~	~	~			~	~			V	~	~		~		~												~	V
Corporation		V	V	V				V																V						
Konecranes Port Solutions - Konecranes GmbH	V	1	1	V			1	V									V				V									1
Kotta Container Company Ltd		•																												
Krech Ojard & Associates Kröger Greifertechnik																														
GmbH & Co. KG					~																									
Kumera Corporation																														
Kumera Getriebe GmbH Kumera Getriebe GmbH																														
LA STEPHANOISE																														
Laidig Systems Inc Laing O'Rourke	~	,										~		V		V													V	V V
Larsen & Toubro Limited																														
Lassing Dibben Consulting Engineers Ltd	~						,	V	,	~	V	V	V	V		V		V	V				,		V	,	,		V	
Lawrence Industries, Inc.														V		V														
LD Ports & Logistics																														V
LDPL Middle East Shipping LLC																														
Leon Overseas Pte. Ltd																														
Liebherr-Hydraulikbagger GmbH					V												V													1
Liebherr-MCCtec																														
Rostock GmbH Lion Bulk Handling b.v.	~	~	~	~			~	~																						
Listenow GmbH & Co.	V	V					~	~						V									V				V			V
Loibl Förderanlagen GmbH	V	V									~	~	~	V		V	~	~	V	~	~	~	V	V	V		V	V	~	V
Lorbrand Lybover	V	V			V	V	V	V			V	V	V	V		V		V	V				V						V	V
Lycopodium																														
Macawber Engineering, Inc MacGregor Sweden AB			,	_					_	~				7		,												_		
Mack Manufacturing Inc					V																									
Magaldi Power S.p.A. MAJOR																														
MAJOR Mantsinen Group Ltd Oy	V	V	V	~	V		V	~											V											V
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Marco – A Terex Brand	V	V					V	V		V	V			V		V	V										V			
Marine Inspection LLC																														
Martin Engineering Martin Engineering GmbH										~				V								~	7				~		7	V
Maschinen und Mühlenbau																													i	
Erhard Muhr GmbH	~						V	V		~				V						V							V			
Maschinen-und Industriebau Feld GmbH	1				1		V			1				~		V														
Matrix PDM Engineering										·																			V	
Maze MH Ltd	V	~		V	V					V	V	V	V	V	V	~	V		V		V					V		~	V	
McCreath Laboratories MegaDome® Buildings																						~								
by Harnois																									V					V
MegaRoller Africa								_						~	V		_												V	V
Mentor Dynamics Merit Technologies	V							V	\						V	V	<i>V</i>		~											V
India Pvt Ltd							V			V				V		V	V				V	V	V	~			~			
Merrick Industries Metalkarma Engineering														V						~	~									
Technologies pvt ltd																														
Metso Minerals Industries, Inc.	V		V	V	V	V	V	V			V	V	V	V											V		V			V
Metso Outotec Corporation MGB & Company	,												7	V		V		7	V											
MHM Mobile Heavy Machinery																														
Mideco Jia Pty Ltd																V							V							
Midwest Industrial Supply Inc Midwest International																							V							
Standard Products, Inc.	1	V																					V				V			V
Mineral Processing Solutions	V		V	V	V		V			V	V		V	V		V	V	V	V	V							V			
Mist-Air Dust Suppression Limited																														
Mitsubishi Chemical																														
Advanced Materials Inc.	V	V				V	V	V						V		V													V	V
Mitsui Miike																														
Machinery Co., Ltd. Mobile Conveying																														
Services Pty Ltd																														
Moffatt & Nichol Mole Master																													~	
Services Corporation™																V									V					V
Monolithic Constructors, Inc.																									V					
Motherwell Automation Motridal SpA	_					~	V	~		_	V	~		_		V		~	V	~	_		_	V	_				7	
MRS Greifer GmbH		V	V	V	V																									
MTECK																														
N.M. Heilig B.V. Nantong Rainbow Heavy	~	V					V			~	V	~	V	~	V	~	~	V	V	~	V	~	V	V	V	~	~		~	V
Machineries Co.,Ltd.	V	V	V	V		V				V						V	V													
Nantong UP Machinery																														
Engineering Co., Ltd Natural Grabs					~																									
NAVCO (National																														
Air Vibrator Co)																														
Navonus NV Negrini Srl					V																									
Nemag BV			V	V	V		V	V									V													V
Neuero Industrietechnik GmbH	V					V	V	V				Ļ																		
NILOS GmbH & Co KG NK Tehnologija SIA	V					V	V		\	V	\	~	~	V		V	V		~				V	~		~	\		V V	V
NKM Noell Special Cranes	•																•													V
NMH s.r.o																														
Noell Crane Systems (China) Ltd																														1
Northern Heavy																														
Industries Group Co., Ltd.																														
NSL Engineering Pte Ltd o.z. HENNLICH ENGINEERING	V						V																V							
OPS Crushing & Screening																														
Orthos Projects Ltd. ORTS GmbH Maschinenfabrik				V	~									V		V		V	~	V	V		V	V					V	~
Oucons Oy					-																									
Overland Conveyor Company																														
P.T. Mitra S.K. Analisa testama PAGE MACRAE																						~								
ENGINEERING					V											V	V						V							V
Pakiet																														V
Parker Hannifin Manufacturing Ltd.														V								~	V	V						,
Parker Plant Ltd	V									V				V				V	V				V							
PEBCO® Inc	V	V				V	V	V	V	V		V	V	V	V	V	V						V	V			V			V
Peinemann Cranes PEINER SMAG Lifting																														
Technologies GmbH					V																									~
Penkert GmbH	V																						V							
Peterson Nederland BV																						~								

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Pfister Waagen Bilanciai GmbH																					V									
PHB Weserhütte, S.A.	V	V	V	V	V		V	V	V	V	V	V	V	V		~				V				V	V	V	V		V	
PHOENIX Conveyor Belt Systems GmbH										1				1																
PLM Cranes B.V.			V	~			V	V	V	•				~																
Pneumat Systems Inc																V											V			V
Polymer Industries - Ultrapoly Division																														~
Portasilo Ltd														V		V				V					V					
Port-Trade AS	V	V	V	V	V					V						V	V			Ť										
Powerscreen														V				V	V											V
PRDW Consulting Port and Coastal Engineers																													V	
Precia-Molen Nederland BV														V		V					V									
Premier Tech Chronos b.v.																														
Procon Engineering Limited ProStack																				~	~					~				
PSB Inspection																		V	V	V	V	V								
PT Armada Rock																														
Karunia Transshipment PT Asian Bulk Logistics																	~													~
PT Boma Bisma Indra																														
PT Bukaka Teknik Utama																														V
PT Carsurin PT Geoservices																						7							~	
PT Jakarta Prima Cranes																														V
PT MBSS																														
PT Mitra Bahtera Segarasejati PT Pamapersada Nusantara																														
PT Pelayaran Sinar																														
Shipping Indonesia																														
PT SpanSet Indonesia PT Thiess																														V
Contractors Indonesia																														
PT. Bando Indonesia														V																
PT. Hardjadinata Pratama																														
Internasional PT. Lelangon																														
PT. Thermialindo Sarana																														
Labortoria	V	V	V	V		V	V	V		V	V	V	V	V		V						7	V	V	V	V	V	V	V	
QCA Systems Ltd. Qingdao Haixi Heavy-Duty	•			•			•	•			•	•				•						•	•		•	•	•	•	•	
Machinery Co.Ltd																														
Qingdao Huaxia Rubber Industry Co. Ltd.	.,					1					.,	.,	.,	.,			V	.,	V							.,				
QML Services	V	~				•				~	V	~	~	V			V	~	V							~				V
Quality Handling																														
Systems Pty Ltd Quanergy																						V								
Quarry Mining LLC							V	V						V		V		V	V				V							
Qube Ports & Bulk																														
R & S Srl / Roncuzzi - WAM Group	V		1	V			1	1	1	1	V	V	V	V	V	V					V	V	V	V		V	.,		1	1
RAM Lifting Technologies	~	7	1	~	V		V	•	•		•	•			•		V				•	•	1		V	•	1		•	
Rapat Corporation																														
Rapidpack RBL REI																														
RBL-REI France										V	V	V		V		V				V	V					~				
RC Inspection B.V																						V								
Real Time Instruments REEL Möller GmbH	V													V			~			~	~	~	V		V		V		V	V V
Reel S.A.S.	~	V												~																
Reel S.A.S.	V	V												V																
REMA TIP TOP AG RENK Aktiengesellschaft	V	V				~	V	~	V	V	~	V	~	~		~	~	V	~	~		~	V			~	~	~	V	
Werk Augsburg																														
REPA Conveyor Equipment B.	V.	V	V	V		V	V			V	V	V	V	V	V		V				V									V
RHC Deutschland GmbH	V	V	V	V	V	V	V	V	~	V	V	V	V	V		~					V		V			V	V		V	
Richmond Engineering Works Richwood Industries, Inc.	\	~	~	~		~	~	~			V	V	>	V			V							V		~	V		V	V
RIKON A/S	V	V	V	V	V		V	V									V							V						~
RINA Consulting S.p.A.	~	V	V	V	V	V	V	V	V	V				~		V													V	
Ringspann GmbH Rocktree Logistics Pte. Ltd.	V	V			V	V	V	V	V	V				V		V			V	V	V	V	V	V	V				V	V
Ronin System Solutions													V		V						V	~		V	~	V				~
Rossi S.p.A.	~	V	V	V	V	~	V	V	V	V	V	V	~	~		V	V	V	~	V						V	V	V		
Rotobec Roxon Oy	V						V			V	V	V		V		V	V									V				V
Royal Haskoning DHV	V	V	V	V	V	V	V	V		V	~	V	~	~	V	~		V	V	V	V	~	V	V	V	~	V		V	
Rubb Buildings Ltd																							V		V					
Rud Chains RULMECA HOLDING S.P.A.																														V
SABS Mining & Minerals																						V								
SAMMI S.r.I. (an Integra Holding S.r.I. company)	V	V				V	V			V	V	V	~	V		V		V			V	V	V	V	V	V	V		V	V

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Sampling Associates																														
International SAMSON Materials																						V								
Handling Ltd (AUMUND Group)	1	V					V			~						•	~						V				V			
Sandvik Mining and Rock Solutions																														
SANY Europe GmbH SAS Global Corp			~	V	V		V	V			V				V		~											V		
SBEC (Pty) Ltd																														
Scantech International SCHADE Lagertechnik																				~		V	~							~
GmbH (AUMUND Group)											V	V	V							V					V	V	V			
Schrage Rohrkettensystem GmbH Conveying Systems																														
Schulte Strathaus																														
GmbH & Co. KG Scorpio Engineering														V																
BMH Pvt. Ltd	~	V	~	V		V	V	V	V	V				V		V	V			V	V		V		~			V	V	
ScrapeTec Trading GmbH Seabulk Inc	~								V					V									~						V	,
Sempertrans Conveyor																														
Belt Solutions GmbH Sempertrans France														V																
Belting Technology																														1
SENNEBOGEN Maschinenfabrik GmbH	.,	.,	.,	1			.,	.,									V													
Sensor Technology Ltd	~	V	V	"			V	V									<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>				V			V						
SERAM SA	~		~	V			V	V								~													V	
SESCOTRANS For Developed Logistics (SAE)	~	V	1	V	~	V	~	V	V	1	V	V	V	~	V	V	1	V	1	v	V			V	~	V			V	1
SEW-EURODRIVE																														
GmbH & Co KG SGS (Nederland) BV																						V		V						
SGS Canada Inc																				V	~	V			~				V	
SGS Minerals Services Shandong Kaiyuan																						V								
Heavy Machinery Co., Ltd.																														
Shanghai Global Machinery Co Ltd																														1
Shanghai Guanbo																														
Machinery Equipment Co.,Ltd Shanghai Janus Grab Co., Ltd.			~	~	V											~														
Shanghai Qifan Co., Ltd.		V			V																									
Shanghai Yo-Pi Port Machinery Co. LTD																														1
Shanthi International	V	~	V	V	V	V	V	V		V																				
Shi.E.L.D. Services srl SIA Graviti	~		V	V	V		V		>	V				V	V	> >	~			~		V	V					V	7	
SIBRE - Siegerland																														
Bremsen GmbH SIDERAR / TERNIUM	V	V				V								V										V		V			V	V
Siebtechnik GmbH																		V	V			V								
Siebtechnik Tema Siebtechnik Tema BV																		~	V			V								~
Siemens AG																								V						~
Siemens AG Siemens Nederland NV																								V						
Siethom Group																														
SIG - Società Italiana Gomma Spa	1	1				V				1	V	V	V	V			1	V								V				
Simplicity Projects Pvt Ltd		V				V	V			V	V	V	V	V		V	V	V	V			V	V		V	V		V		
Sly LLC SMB International GmbH	V	V					V	~		V	V	V	V	V									~						V	
Smiley Monroe Ltd							,							V				~	V				V				,		~	
Sobemai Crane Services by Solitec Engineering Ltd	~				~		V	V						V		V											V			
Sotecma	V	V							V	V	V	V	V	V			V	V	V	V	~		V		V	V	V		V	
Spohn + Burkhardt Sicherheitstechnik GmbH														V										V						
Spraystream										. 4													V							
STAG AG Standard Industrie	~	~								V				V			~	~	~	~			V		V	V	V	~	V	V
Stantec	V	V				V				V	V	V	V	V		V	V	V	V	V	V	V	V	V	V	V	V	V	V	
Stemm Equipos Industriales, S.L.			1	~	V		~	~									~												V	
STM Industriale srl	V						V			V	V			V		V	V	V	V							V				
STM SpA Stokman BV		V					V	V						V										V		V				~
Strudes Inc	V	V			V	V	V			V	V	V	V			V		V	V	V	V	V	V		V	V	V		V	
STUDIO TECNICO MALNATI SAS										1				V				1	V		V	V		1					1	1
Sucofindo																														
Sumitomo Heavy Industries Material Handling Systems																														
Co., Ltd.	V	V		V		V	•	V			1	v	V	1											V	V				
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Superior Industries Superior Industries, Inc.	V	V					V	V		V	V	V	V	V		V											V			
Supreme Manufacturing, Inc. Synergy Engineering Ltd	~	~				V	~	V		~	~	~	V	~		V	~	V	~				V	V			~	V	V	
Tamtron Group																		•												
Tank Connection TAPC - Total Air																									~					
Pollution Control TBA Group																								V						V
TBK Group by TD Micronic	V									V	V	V	V	V				~	V		V		V							
techNaero aps												•		V									V							
Tecpro Australia TEHNOROS	~		V	V	V	V					V	V	V				V			V			~				V		V	V V
Tele Radio Tele Radio i Lysekil AB	_	V	,	_	,	_	V	_		_	V	,	V	V	V		~	~					V	V	V	V	V	_		
Telestack Limited Tenova S.p.A.	V	V		7		,	V	V		V	V	V	V	V		V	V			V			V	V	7	V	V		V	V
Terex																														
Terex Deutschland GmbH Teufelberger Seil Ges.m.b.H	~	V		V	V		V	V	V	V				V			V						V				V			V
The Grab Specialist b.v. The Hilliard Corporation					V																									
The Raring Corporation																							V							
THIELE GmbH & Co KG Thor Global Enterprises Ltd.	V						V	V	V	V	V	V		~		V	V												V	V
Thorwesten Vent Tidfore Heavy Industry																														
Manufacturing Co., Ltd																														
Tinamu Labs AG TMEIC																														
TMSA Tecnologia em Movimentação S/A	,	1	,	1	1	1	V	,		1	V	1	V	,		V			1	1	V	V	V			V	1			V
Tobu Jukogyo Co, Ltd. Topcon Technology Ltd					V											V					V									
TPI Engineered Systems																														
Trans-Global Solutions, Inc. Trans-Global Solutions, Inc.														V																
Transship LTD TRF Limited (TATA)	,	,	,	~			V	,		,	7	,	V	,	~	,		,	,	,			V				,			V
Triodetic	·	Ĺ	·	Ů						·		Ť	·	·	Ť	·			·	·			V		V		Ĺ			
Tru-Trac Rollers (Pty) Ltd TSP Korea																														
Tsubaki Kabelschlepp GmbH Tsubakimoto Bulk	V	V	V	~		V	V	V	V		V	V	V											~		V	V			
Systems Corp. TTS (Transportation														V																
Technology Systems) LLC	V	V					V	V		V	V	V	V	V		V	V									V	V		V	
UAB "PATIKIMA LINIJA" ULMA Conveyor Components																														
Veenstra Machinefabriek B.V. Ventyx	~																						V							V
Verachtert Nederland B.V. Verstegen Grijpers BV					V																									V
Vibco Inc		,			Ĺ	ļ								~		V							V				V			
Vibrafloor Virta Inc.	V	V				V		V		V	V	V	V	V		V	V	V	V	V			V	V	V	V	V	V	V	V
VIVO consult s.r.o. Vollert Anlagenbau GmbH																											V			V
Vortex Global Limited VSR Industrietechnik GmbH	V	V	V				V				V	V	V	V									V				V			V
Wajax												·		Ť																
WAMGROUP S.p.A. WeatherSolve Structures																							V							
Weba Chutes WEG																													V	V
Weightron Bilanciai Ltd Weir Motion Metrics																														
Wirtech AG														V																
Wolf Material Handling Systems	~	V					V	V	V	~	>	V	V	V		V	~										V			
Wolf Point Engineers & Contractors	1		V	1			1	~		V	V	1	V	~		V		V	V	V	V	V	V	V	V	V	1		~	
Wölfer by WiCHMANN E GmbH																								~						
World Domes - A Domtec																														
International Company Worley Parsons Canada																									~					V
(Westmar) Wuvio International	V	V												V		V							V				V		V	
Yernaux-Pasage																					V									
ZAO SMM (CJSC SMM) ZPMC - Shanghai Zhenhua																														
Heavy Industries Company Limited	~	V	,	V			V	~			~	1	V	,										,					V	
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320 T MATERIAL HANDLER FOR DEMANDING PORT HANDLING

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- Several power options: Diesel / Electric / Electric with Powerpack for independent maneuverability
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Robert Aumüller

SENNEBOGEN

Maschinenfabrik GmbH

94315 Straubing, Germany
robert.aumueller@sennebogen.de





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