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■ Cement Handling & Storage

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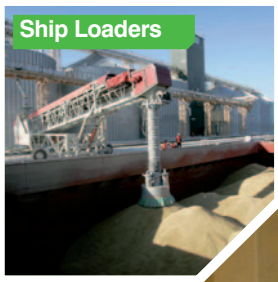
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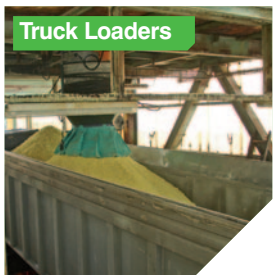
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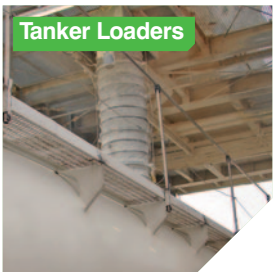
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Obstacles to coal trade's progress

During recent weeks signs of adverse influences already affecting or likely to affect commodity imports have become more prominent. Consequently estimates of world seaborne dry bulk trade in 2025 have been revised downwards to show little or no growth, with a possibility of a reduction.

The outlook for world economic activity has deteriorated, amid trade policy changes with widespread impacts in many countries. In its latest assessment the International Monetary Fund observes that "the global economy enters a new era" amid trade tensions and high policy uncertainty which, if sustained, has the potential to slow economic growth significantly. Forecast 2025 global GDP growth has been lowered by half a percentage point to 2.8%, after last year's 3.3% increase.

COAL

One especially visible puzzle, albeit for separate reasons, is prospects for coal trade after substantial enlargement over the past two years. Current indications point to limited potential for this upwards trend to continue, and a more likely outcome is that the 2025 total volume will be below the level seen in the previous twelve months. Reduced steam coal import demand is foreseeable.

Among individual importing countries where changes may be envisaged, China's purchases are particularly difficult to predict. Growth in world seaborne coal trade in the past two

years has been largely a result of greatly expanded purchases by Chinese buyers. In the first quarter of 2025 the country's coal imports (including some overland movements) were down by 1% to 114.8 million tonnes, reinforcing other signs of a possible downturn in the annual volume

IRON ORE

Steel production in many raw materials importing countries could be negatively impacted by a weakening of global economic activity in the twelve months ahead. Output in numerous steel-using manufacturing industries, as well as in construction, may be restrained by slacker consumer and corporate spending patterns.

While providing only limited indications of the ongoing trend, World Steel Association data for crude steel production in the first quarter of 2025 showed some contrasting outcomes. Reductions, compared with the same period a year earlier were seen in the European Union (down by 2.5% at 32.4mt), South Korea (down by 3.6% at 15.5mt) and Japan (4.9% lower at 20.4mt). By contrast China's volume was 0.6% higher at 259.3mt.

GRAIN & SOYA

Prospects for world trade in wheat plus corn and other coarse grains suggest that a much lower total is foreseeable in the current 2024/25 trade year ending third quarter 2025. For the period further ahead expectations are still tentative, awaiting further clarification of northern

hemisphere summer harvests in importing countries which will affect import requirements.

Updated estimates published by the US Department of Agriculture last month showed world wheat and coarse grains trade falling by 49mt or 10% in 2024/25, to 416mt. These volumes are mostly seaborne movements. Continued downwards revisions of China's imports are the main contributory influence, with these now forecast to fall by 36mt (59%) to 25mt, amid abundant supplies of grain available in the Chinese domestic market.

MINOR BULKS

The 'agricultural bulks' sub-category of the minor bulks segment comprises various oilseeds and meals, rice, sugar and other commodities, totalling over 275mt in 2024. After an upwards trend in recent years, some signs point to a flat or lower outcome this year.

BULK CARRIER FLEET

Almost two-fifths of the world fleet of bulk carriers consists of 'Capesize' vessels, statistically defined as bulk carriers of 100,000 deadweight tonnes and over, including Newcastlemaxes and very large ore carriers. In the past year this category grew by under 2%, as shown in table 2, to 401m dwt at end-2024.

Signs suggest a similar outcome during 2025, reflecting stable newbuilding deliveries, although there is potential for increased scrapping to occur and reduce the fleet growth rate.

TABLE 1: STEAM COAL IMPORTS IN KEY ASIAN COUNTRIES (MILLION TONNES)

	2019	2020	2021	2022	2023	2024*
Japan	125.8	118.5	124.3	126.8	113.2	116.5
South Korea	111.9	96.1	97.6	97.5	92.6	86.0
Taiwan	58.1	54.6	56.3	51.0	46.9	46.0
China	216.0	193.4	241.2	197.5	313.8	359.0
India	192.3	167.5	136.2	173.0	188.8	175.5
Total of above	704.1	630.1	655.6	645.8	755.3	783.0

source: various & BSA estimates *BSA estimate

TABLE 2: CAPE SIZE (100,000DWT & OVER) BULK CARRIER FLEET (MILLION DEADWEIGHT TONNES)

	2019	2020	2021	2022	2023	2024*
Newbuilding deliveries	19.0	25.1	19.0	10.3	10.7	7.7
Scrapping (sales)	5.9	11.4	3.4	2.9	1.0	0.8
Losses	0.0	0.5	0.0	0.0	0.0	0.0
Plus/minus adjustments	0.0	0.0	0.0	0.1	0.0	-0.1
Fleet at end of year	348.1	361.3	376.9	384.4	394.1	400.9
% change from previous year-end	+3.9	+3.8	+4.3	+2.0	+2.5	+1.8

source: Clarksons (historical data) & BSA estimates *BSA estimates

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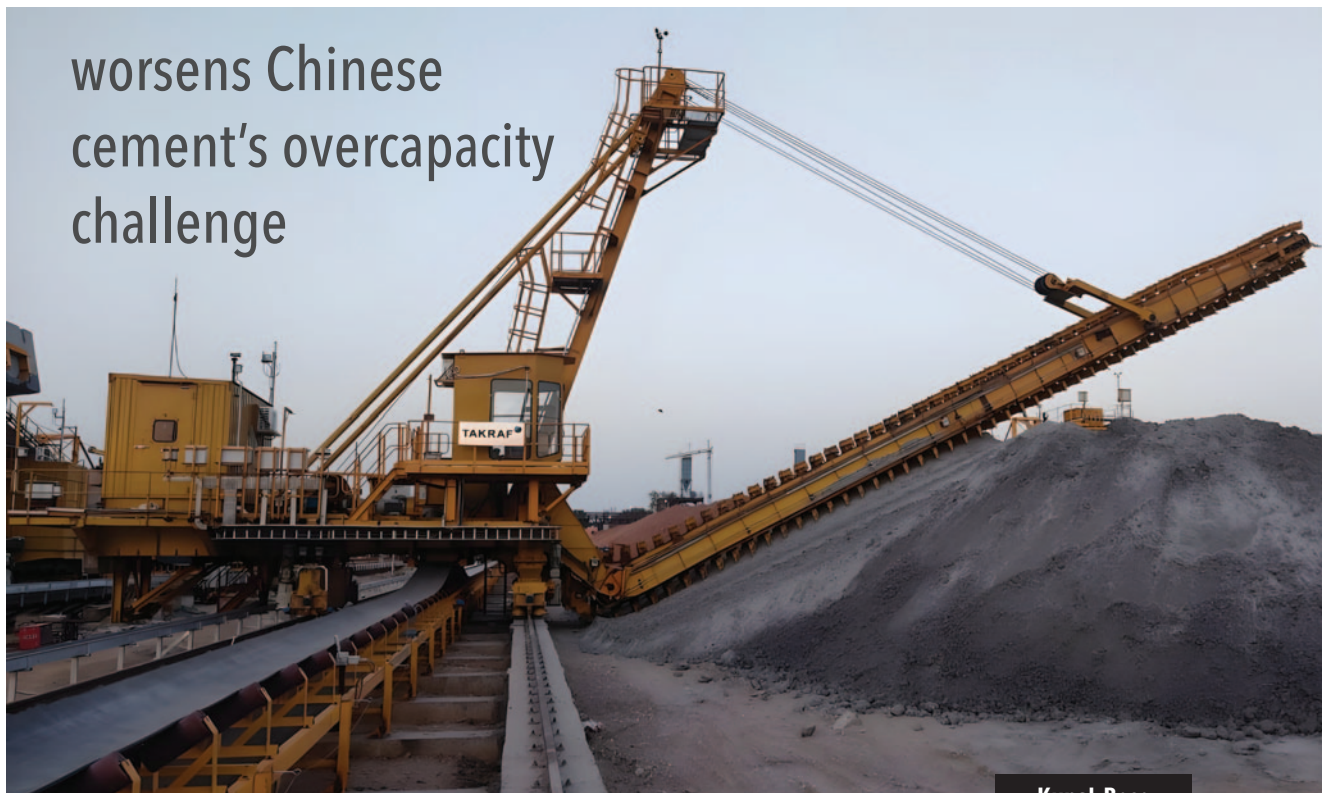
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Shrinking demand

worsens Chinese cement's overcapacity challenge



Kunal Bose

The Chinese cement industry, which is by far the world's largest, is seeing yearly decline in capacity use and a growing pressure on margins. In contrast MENA region, India and Vietnam are building new clinker and grinding capacity in anticipation of domestic cement demand growth.

The world's two leading cement producing countries, China and India, had a few common negative experiences last year resulting principally from falling demand from the infrastructure sector. At all times, at what rate highways to sea ports to airports will be built remains a government decision in the two countries to fund new projects. Beijing's past policy has resulted in the country, the world's second-largest economy after the US, already having a fairly robust infrastructure. As a result, the materials that go into building infrastructure from cement to steel to aluminium have all started feeling the impact of demand saturation. To add to the distress of cement makers, China's property market remains mired in a crisis, resulting from overspeculation by the likes of Evergrande, Country Garden and Sunac

defaulting in repayment of borrowings.

The debt-financed oversupplied building market is seeing falling demand from buyers unsure of the fate of their investment. With infrastructure and building construction being the two principal cement user sectors, shrinking demand there could only result in fall in capacity utilization, margin erosion and adverse working of cement groups. This has been much in evidence with the Chinese cement industry coinciding with the country settling down to a low rate of GDP (gross domestic product) growth. An industry carrying the load of a huge surplus capacity in the face of the economy seeking stimulus from the government, the China Cement Association (CCA) describes the situation as a "continuous decline in demand, low price fluctuations and continuous losses in the industry."

Referring to the falling production graph of cement, inevitable in the difficult economic situation, the country's National Bureau of Statistics says, output of the binding building material fell from 2.36bn tonnes in 2021 to 2.13bn tonnes in 2022

and then further to 2.02bn tonnes in 2023. Besides the property market crisis, which is not compensated by any upsurge in infrastructure investment, a falling population and squeezed middle class continued to weigh on the cement industry in 2024 when production stepped back by 9.8% to 1.825bn tonnes. This meant capacity use last year was down to 50% from the year before's 56%. The last few years' performance shows a significant fall from the peak production of 2.5 trillion tonnes between 2002 and 2014 when infrastructure and real estate development claimed high investments. In a big country like China or India, cement capacity is regionally dispersed to avoid cost of transportation over long distances by either road or rail. Last year, significant declines in cement production happened in China's northeast, northwest and central and south regions.

WORSENING CHINA CEMENT SCENE

The deteriorating Chinese scene has prompted *International Cement Review* to forecast: "Production at large plants is likely

to continue to be substantially reduced while strong domestic competition and decarbonization targets will add pressure to unsustainable operations, resulting in more closures in 2025.” Rating agencies such as Fitch have had occasions to downgrade leading Chinese cement groups in the face of falling margins, negative free cash flow and increasingly higher leverage. There is a consensus among experts and also in the government that the industry is now paying the price for building of overcapacity over the past many years and not all of that energy efficient and environment friendly.

The move by some industry constituents to go on building capacity abroad, including in African countries despite setbacks in working in their core domestic market has invited frowns from rating agencies. Though exact figures are difficult to come by, China observers believe that the industry is sending some locally produced cement for use in Beijing sponsored overseas construction projects. In pursuit of expanding its spheres of influence across the globe — the 2013 launched belt and road initiative, also known as the new silk road focusing on infra building in countries in all the continents speaks most loudly of Chinese political ambition — Beijing comes under pressure particularly from poor but resources rich countries to build factories there for local value addition.

Besides compulsions to invest in faraway African countries, richly endowed with limestone, clay and marl, the Chinese cement groups must also have considered that an overseas production foothold would spare them the challenge to organize shipments of the bulk cargo, which is susceptible to moisture and quality deterioration over time in specially built carriers. In spite of logistical challenges to move cement by waterways and the cost involved, the seaborne trade in the material is around 180mt (million tonnes) out of seaborne movement for all items at 12.3bn tonnes in 2024. This includes a historic milestone of 5.6bn tonnes of dry bulk cargo.

Besides the negative impact on cement demand linked to reduced sectoral investment in infrastructure and housebuilding, the industry has to contend with progressive transformation from cement concrete to steel building structures. A study shows China is now using annually over 100mt of the metal steel structures. That is a significant progress from around 50mt some six to seven years ago. The trend of growing

percentage of steel used in construction vis-à-vis cement will continue in China with advancement in technology. For instance, in developed economies, steel to cement consumption is significantly higher than either in China or India, often reaching 1.5 or even higher.

Even though plagued by falling demand and capacity use, China with cement production of close to 1.9bn tonnes had by far the largest share of the world 2024 output of around 4bn tonnes. India comes second with production of 450mt in the global pegging order, but trailing China by a big margin. After providing for production downslide in recent years, China is found responsible for close to 75% global growth in cement production since 1990 and as a natural corollary, the industry's carbon footprint rose to government and also

global concern.

Studies show China cement-related emissions peaked in 2018 at 1.073bn tonnes of CO₂ and these have remained high since. In a two-step move to curb emissions and make cement making progressively environmentally sustainable, Beijing has plans to cap the clinker capacity at 1.8bn tonnes by 2026. At the same time, the message has gone loud and clear to the industry to go on improving energy efficiency in operating clinker production lines, to quickly make at least 30% capacity operate at above the national energy efficiency benchmark level.

OTHER CEMENTITIOUS MATERIALS

The industry also remains under pressure to use growing volumes of renewable energy and alternative fuels. Clinker use is



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also sought to be curbed by the industry using growing quantities of other cementitious materials like blast furnace slag and fly ash, thereby giving a boost to recycling. Like with steel and aluminium, China is allowing building of new clinker plants only as capacity replacement.

At the same time, in a cleaning-up operation launched at the behest of government, the industry continues to disband energy inefficient and disturbingly polluting capacity. Cement has an 8% share of China's total CO₂ emissions. But under growing pressure from the government and

environmentalists, Chinese cement makers are applying carbon capture technologies. The industry is credited with commissioning a very large-scale oxy-fuel combustion cement plant at Qingzhou in Shandong province. The largest of its kind in the world cement industry, the Qingzhou unit is capable of capturing 200,000 tonnes of CO₂ a year.

In the meantime, cement along with some other big polluting industries is being included in the national emissions trading system (ETS). A leading Indian cement producer says: "We are closely watching

carbon capturing work by our counterpart in China and other pollution mitigating work done there. The common goal for the world's two largest cement makers is to progressively reduce the industry's carbon footprint."

Pressured to comply with environmental regulations in an unfavourable industry outlook marked by falling cement prices telling on margins, the industry consolidation gains in momentum. Simultaneously, there will be further phasing out of inefficient, smaller sized producers unable to ride out the prolonged



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loss-making phase.

Industry consolidation began in a meaningful way coinciding with the country's 13th five-year plan (2016–20) and by now well over 60% of clinker capacity is owned by ten largest cement groups. But China will still have to do a lot of catch up to come to the consolidation level found in Europe and the US, there still being in operation a large number of independent small cement companies in the world's second-largest economy.

Incidentally, China hosts the world's two largest cement groups in CNBN with capacity of 530mt and Anhui Conch with capacity of 353mt. Both the companies have overseas production centres. Holcim of Switzerland is the world's third largest cement group with capacity of 253.6mt. The Swiss company, which in pursuance of 'NextGen Growth 2030' strategy is expanding the portfolio of high-value building solutions such as building systems and high-performance concrete to ensure half the net sales come from building solutions.

In the meantime, Holcim has been engaged in streamlining operations that saw it exiting bulk cement business in Indonesia, India and Nigeria (to be divested in favour of China's Huaxin Cement) to step up presence in high-growth regions and in solutions instead of commodity cement. Germany based multinational Heidelberg Materials, which besides offering solutions makes cement, aggregates and ready-mix concrete, is the global industry's fourth largest.

CONTRASTING INDIA SCENE

In India and other emerging and developing

economies cement will be needed in growing quantities to support infrastructure building and urban and rural housing. In contrast, China, which already has a fairly robust urban infrastructure, developed over the years, will continue to experience cement demand fall, calling for sectoral reforms by way of another far-reaching round of capacity consolidation. In any case, small and medium Chinese cement groups having conceded pricing initiative to industry giants and experiencing growing pressure on margins will not demur selling out. The US and Europe have highly developed infrastructure and cement will be needed there for infrastructure renewal and maintenance. At the same time, the US, the UK and some other European countries are in need of new houses to accommodate growing population, including immigrants creating demand for cement.

The world's fourth-largest producer, the US, saw a marginal fall in production to 86mt in 2024 and total shipments contracted by 6% year-over-year to 103mt. Economic slowdown and high interest rates impacting residential construction restricted cement consumption to 110mt. While new house starts outlook remains subdued what with Trump-Powell differences over interest rates, expected rises in infrastructure investment will generate cement demand. Europe, which is increasingly geared to make green cement to support sustainable and eco-friendly construction, had a cement market for 315.8mt in 2024 with Germany leading the pack followed by Spain and Poland. European cement demand will be driven by

“renovation, remodelling and reconstruction of infrastructure projects and filling the gaps in housing.”

The three years preceding 2024–25 (April to March) Indian cement makers had the benefit of strong demand growth, fuelled by good showing of infrastructure, housing and industrial and commercial segments. But thanks to holding of general elections when workers en masse returned home to participate in the dance of democracy, an extended monsoon well spread across the country affecting construction work, weak government spending in the first half and a slow real estate market moderated cement demand growth last fiscal to “4.5 to 5.5%,” says Crisil Intelligence. Demand improvement seen since the second half of 2024–25, continues to gain pace in the current year when consumption is to rise in the range of 6.5-7.5%, according to Crisil. The main two triggers for demand growth are the “10% rise in budgetary allocation for core infrastructure ministries and on expectation that an above normal monsoon will boost agricultural profitability, in turn lifting rural housing demand.”

Infrastructure and rural housing, both prioritized by New Delhi for funding have more than 30% share each of the country's cement use. In the meantime, a good tide for cement demand is urban housing benefiting from interest rates falling. Another rating agency ICRA has forecast a healthy Indian cement volume growth of 6% to 7% fuelled by improvement in demand from housing and infrastructure sectors.

Encouragingly too, Indian cement prices have started improving after a 10% fall in average realization in last year's first half. In spite of some demand blip in 2024 under the weight of some adverse, but temporary in nature, developments, the Indian industry continues to create new capacity along with continuing progress in consolidation of capacity.

NEW INDIAN CAPACITY

ICRA official Abishek Lahoti says: “Backed by healthy demand, we foresee capacity addition of 43–45mt in 2026 financial year. This follows estimated capacity addition of 32–35mt last year. Large cement groups operating at optimal utilization levels are principal movers in fresh capacity building in order to maintain their market share.” He further says, the industry's capacity utilization in the current year will remain “stable at 70% on an expanded base.”

Besides India, a star performer is Vietnam



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where the cement market is expected to record a CAGR (compound annual growth rate) of 7.98% between 2025 and 2033. Growing demand for urban housing as high levels of migration from rural centres to cities happen, commercial buildings and infrastructure will support building of new cement capacity at an accelerated rate. Government support by way of investment incentives and streamlining of regulatory processes continues to encourage investment in the sector. Expanding

domestic use led to a 3.5% rise in production to 184.2mt. Vietnam is also a regular exporter of cement, overseas shipments being 20.29mt in 2024.

MENA (Middle East and North Africa) region holds encouraging prospects for cement. The market for the bulk commodity in the region is driven by construction of industrial projects and office and residential buildings. Rapid urbanization and people from outside coming to MENA to work and as tourists

are prompting major investment in building infrastructure, resulting in demand generation for cement. A market survey says the region that attained a production volume of 756.12mt in 2024 is forecast to record a CAGR of 5.5% to reach nearly 1,224.23mt by 2034. Meanwhile, Egypt, Saudi Arabia and UAE are among the major producers and users of cement in MENA, foreign groups such as CEMEX, Heidelberg and CNBM have cut major production profile there.

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Rhenus barges into India

Through the Memorandum of Understanding (MoU), leading global logistics service provider, the Rhenus Group, will operate barge services in various national waterways in India. In the first phase, Rhenus will introduce push boats and 20 flat bottom barges from Germany with a capacity of 400 tonnes, which can be combined to transport up to 1,200 tonnes per trip. As demand grows, Rhenus India will scale its fleet to 100 barges and expand its corridors across the Indian subcontinent. The partnership with IWAI aims to contribute towards building a resilient multi-modal logistics ecosystem in India, with the eventual goal of carrying over a million tonnes of cargo per year by 2025.

Rhenus signed the MoU with IWAI on 6 May 2025 to align with the government's commitment on strengthening inland waterways as a key pillar of India's logistics ecosystem. Rhenus is proud to support India's Maritime Amrit Kaal Vision 2047 and lead the way in shaping the future of sustainable logistics and contribute to India's logistics transformation.

With over 14,500 kilometres of navigable waterways, including 111 National Waterways, India's Inland Water Transport (IWT) sector, which is governed by IWAI, has seen significant growth. Cargo volumes have increased from 30mmtpa (million metric tonnes per annum) in 2014 to 133mmtpa in 2024.

Rhenus India will introduce its inland waterways transport solutions: barge scheduled services that will facilitate cargo transport on two Indian rivers, the Ganga River and the Brahmaputra River. These sustainable and cost-effective logistics solutions will allow for seamless cargo movements across India and beyond. In this venture, Rhenus is expanding its existing



expertise for port operation and inland navigation from Europe to India.

To start, Rhenus India intends to operate barge services on National Waterways NW-1, NW-2, NW-16 and the Indo-Bangladesh Protocol route (IBP), with plans to gradually scale up to include other national waterways in the country. A combination of pushers and barges, to suit low-draught navigation in the waterways, will be used to transport both bulk and breakbulk cargo across north and east India, North-East India, and subsequently neighbouring countries. With 1,000 vessels in operations daily on all navigable waterways in Europe, Rhenus will now tap into its Port Logistics experience, in particular in European inland navigation, as well as resources from its European Waterways fleet to further support India's IWT sector.

In Europe, Rhenus has been active in the inland navigation sector since its foundation year 1912. With barge shipping as its core competency, the Rhenus Group built its company and service portfolio around its logistics activities along the Rhine River and diversified them to include air and ocean

freight, warehousing, road freight as well as rail, over time, becoming a worldwide logistics solutions provider.

Vivek Arya, CEO of Rhenus Logistics India & Global CEO of Rhenus Warehousing Solutions Intercontinental, said, "With over 100 years of dedicated expertise in inland waterway operations across Europe, Rhenus is excited to partner with IWAI in this transformative journey to create a smarter, greener and more economical logistics network. Recognizing the immense potential of India's inland waterways, we are committed to adapt our best practices to suit the Indian environment and contribute towards seamless waterway movement through our innovative solutions."

Michael de Reese, Division Head of Rhenus Port Logistics, added, "Inland navigation is the backbone of the producing economy in Germany as well as in Europe. With our expertise and our broad experience in mastering challenges such as infrastructure construction, varying water levels and the training of a reliable expert workforce, we can support the growing Indian economy together with the IWAI."

The Ganga (Ganges) River in India.



ABOUT RHENUS

The Rhenus Group is one of the leading logistics specialists with global business operations and annual turnover amounting to €8.2 billion. 41,000 employees work at 1,330 business sites in more than 70 countries and develop innovative solutions along the complete supply chain. Whether providing transport, warehousing, customs clearance or value-added services, the family-owned business pools its operations in various business units where the needs of customers are the major focus at all times.

Lloyd's Register grants industry first full antifouling approval to Jotun's Hull Skating Solutions

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Lloyd's Register (LR) has awarded the world's first Recognised Enhanced Antifouling Type Approval to Jotun's SeaQuantum Skate antifouling coating, alongside type approval certification for the HullSkater hull cleaning equipment.

The approval, announced at Nor-Shipping 2025, covers both the HullSkater robotic cleaning device and the SeaQuantum Skate coating, making it the first fully integrated hull cleaning and coating solution to be certified by a classification society.

Jotun's HullSkater is a remotely operated robotic cleaner designed to remove early-stage biofouling without damaging antifouling coatings. It is always paired with the SeaQuantum Skate coating, and together it forms a fully compatible cleaning and coating regime.

The Recognised Enhanced Type Approval is the highest level of certification under LR's Antifouling Coatings programme. The Recognised approval status, now achieved by Jotun, is based on extensive in-service performance data from at least three vessels. This includes inspection reports before and after cleaning, time-to-refoul measurements, coating condition assessments, and third-party water quality testing conducted during the cleaning process. Recognized approvals are valid for five years and can be renewed with continued performance evidence.

Type approval of the HullSkater cleaning equipment is based on the cleaning performance, electrical and mechanical equipment fit-for purpose and data from water sample analysis in the vicinity of operation versus background samples.

The LR approval provides verified operational guidance to ship operators, specifying appropriate cleaning heads, optimal pressures, recommended cleaning cycles, and maximum allowable fouling levels before intervention becomes necessary. The certification identifies unsuitable cleaning methods, protecting both coating integrity and performance.

LR developed the Enhanced Antifouling Type Approval to bridge the regulatory and scientific gap in hull cleaning practices, ensuring that ship operators have access to objective, evidence-based guidance. It also enables vessels to qualify for LR's Clean Hull (CH) notation under the ECO class, which requires an Enhanced Antifouling Type Approval for any applied coating.

Heather Hughes, Principal Specialist at Lloyd's Register, said: "Ship operators are approaching LR seeking authoritative guidance on which coatings can be effectively used as part of their comprehensive hull management planning. We provide independent verification of antifouling coating performance both before and after cleaning, ensuring operators can make informed decisions with confidence."

Morten Fon, CEO of Jotun, said: "This approval validates the long-term performance of the HullSkater and SeaQuantum Skate. We're proud to set the standard for integrated solutions that protect both vessels and the oceans they operate in."



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Maritime industry needs decisive action on cyber risk says ABS Consulting cyber expert

"Between expanding attack surfaces and increasingly sophisticated threats, the stakes have never been higher. It is essential for the maritime industry to not only understand its cyber risk but also translate that knowledge to decisive action that protects lives, operations and assets."

That was the message to the industry from Michael DeVold, Director of Maritime Cybersecurity at ABS Consulting, speaking at the 2025 Maritime Cybersecurity Summit hosted by the Maritime Transportation System (MTS) Information Sharing and Analysis Center (ISAC).

DeVold, a retired United States Coast Guard (USCG) officer with more than 20 years of experience, spoke on two panels: Global Maritime Cyber Threat Landscape and Regulatory Compliance and Standards. Speaking alongside industry leaders representing organizations such as The Port Authority of New York & New Jersey, USCG and the Cybersecurity and Infrastructure Security Agency (CISA), he emphasized that cyber preparedness was more critical today than ever.

"The importance of a robust cybersecurity approach cannot be overstated," said DeVold. "Cybercriminals are constantly evolving their tactics to

exploit vulnerabilities within port and maritime systems and networks. It is vital that the industry responds in kind."

As a key collaborator with industry, government and organizations like MTS-ISAC, ABS Consulting provides critical operational direction to help businesses manage cybersecurity. One of the topics discussed at this year's Summit included the latest cybersecurity requirements issued by the USCG for US-flagged vessels, Outer Continental Shelf (OCS) structures and other facilities subject to the Maritime Transportation Security Act (MTSA). These expansive regulations are reshaping how the industry responds to and manages cyber risks.

Shawn Whiteside, Executive Director of MTS-ISAC, echoed DeVold's sentiments, emphasizing the importance of adopting a rigorous approach to building a resilient maritime cybersecurity ecosystem. "The maritime industry plays a critical role in global trade, making it an attractive target for cyber threats. By fostering greater collaboration and knowledge sharing across the sector, MTS-ISAC and its partners help to strengthen our collective resilience."

With deep practical expertise in maritime operations and cybersecurity, ABS Consulting is eminently equipped to

support MTSA-regulated stakeholders in their journey to compliance. DeVold's previously published paper, *Managing Maritime Cyber Risk – Rising to USCG's New Maritime Security Directive*, examines the effects of the mandatory cybersecurity measures on US-flagged vessels and facilities, providing critical analysis for industry stakeholders in navigating these regulations.

ABOUT ABS CONSULTING

ABSG Consulting Inc. (ABS Consulting) is part of ABS Group of Companies, Inc., a global expert in safety and risk management for critical infrastructure worldwide and a subsidiary of ABS, one of the world's major marine and offshore classification societies. With over 50 years of risk management and safety experience, ABS Consulting provides engineering, data science and management consulting services globally to help its clients manage their safety, security and operational risks. Headquartered in Spring, Texas, ABS Consulting operates with more than 700 professionals across the globe serving the marine and offshore, oil, gas and chemical, government, power and energy, and industrial sectors.

New vessel operation management platform to overcome legacy corporate culture

Kawasaki Kisen Kaisha, Ltd. ("K" LINE) has introduced the operation management platform Veson IMOS Platform (IMOS, provided by Veson Nautical) as part of its digital transformation (DX).

IMOS is an integrated platform that optimizes operation management tasks such as charter contracts, cargo contracts, fuel, and accounting. It is equipped with advanced functionalities that support data utilization and decision-making, helping to optimize operational efficiency by making use of operational data.

"K" LINE has previously been using multiple systems dedicated to specific tasks, such as charter contracts and accounting, but IMOS has now been introduced with the goal of unifying and

standardizing work processes. In addition to simply replacing previous systems, the introduction of IMOS will foster the ability to quickly adapt to

changes in the business environment, while at the same time allowing "K" LINE to overcome legacy corporate culture and to offer customers more value.

"K" LINE's Medium-Term Management Plan frames DX as a business foundation that is of key importance to the company's management strategy, along with safety, vessel quality control, and environmental and technological sophistication. Centring on "K" LINE's Group-wide DX promotion, the aim is to build a solid business foundation and achieve a sustainable improvement in corporate value by utilizing data and digital technology to address issues related to safety and quality improvements while cutting CO₂ emissions.



Tarragona offering raft of new dry bulk concessions

Tarragona Port Authority has issued a tender seeking an investor willing to construct and operate a new conveyor belt system on Castilla-Sur Quay.

This brand new installation, which will cover a maximum area of 2,400.62m², will mainly transport dry bulk commodities. Investment should be within the region of €2 million, with a concession available of up to 40 years.

Bidders must have an annual turnover of at least €10 million and three to five years experience of handling 400,000 tonnes of dry bulk at ports.

This is one of six new concessions that the port authority is offering on various parts of the Aragón, Castilla and Navarra quays, additionally including dry bulk handling, transporting and storage, with an overall investment of €38.493 million.

Barry Cross



20
YEARS
LEADING GREEN

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New southern Peru port project taking shape

Consorcio Portuario e Inversiones Tuzel has put forward a \$500 million investment proposal to build the Almirante Miguel Grau Port Terminal in Tacna, Peru. Essentially, this would involve construction of an entirely new port, which would serve southern Peru, and is already being reviewed by Tacna's Regional Government. The initial proposal encompasses land acquisition, technical studies, construction

and work oversight.

Significantly, the project is being backed by China's Tianji International, whose involvement it is hoped will guarantee the viability of the project. In addition, the US-based company ANU Global Green Energy Holdings has indicated a strong interest in also being part of the port development, and already manages a portfolio of investments in the US, Brazil and Africa.

To further strengthen the case for the new port, the Regional Government has asked the Ministry of Transport and Communications to include the project in its Multi-Annual Public-Private Partnership (PPP) Investment Report, which would ensure the proposed port terminal was to be considered of national interest, which would help its next step forward as a public-private partnership. *Barry Cross*

Vale automates stacker-reclaimers at TIG

In Brazil, Vale has completed the automation of the three stacker-reclaimers it operates at its Guaíba Island Terminal (TIG), which is located at Mangaratiba, in Rio de Janeiro state. Upgrades, which cost \$10 million, allow the equipment to operate completely autonomously, without the requirement

of on-board personnel. The company claims that this enables it to remove operatives from potentially dangerous working areas, and has already resulted in a 12.3% improvement in ore recovery rates compared to the previous manual operation.

At TIG, stacker-reclaimers handle iron

ore in the stockpile area, loading it onto a conveyor-based system to make up shipments for export by maritime vessel.

To date, Vale has trained 70 personnel to work in the new automated environment, essentially overseeing operations undertaken by the upgraded stacker-reclaimers. *Barry Cross*

Tender opens for new dry bulk port at Sagunto



Valencia Port Authority has issued a tender for a concession to build and operate a dry bulk terminal at the Port of Sagunto, which it also oversees in addition to the main port at Valencia itself.

In addition to the loading and unloading of vessels, the concession will also cover on shore storage of commodities.

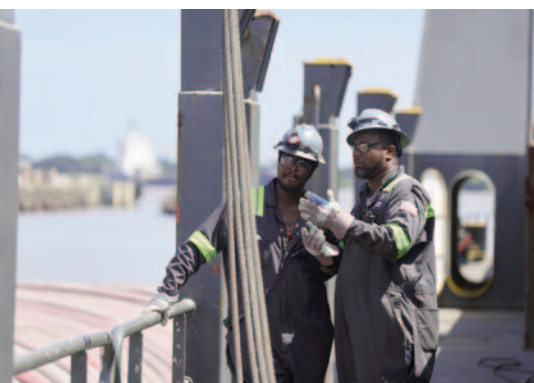
The concession, which is for a period of 35 years, encompasses an area of approximately 51,500m² located between South Quay 1 and North Quay 2 at Sagunto Port.

Furthermore, a paved area will also be available to the concessionaire, which connects to North Quay 2 road.

Bids must be received no later than midday on July 14.

Barry Cross

A quick note of “Thank you” to our Global Partners.



We appreciate the opportunity to work with you.

Our strengths are our people and our innovative technologies, allowing us to move cargos safer and more efficiently than ever before. Our team strives every day to meet our customers' waterborne transportation needs while also being leaders in safety and environmental stewardship. Waterborne commerce never stops, and neither do we.

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**ASSOCIATED
TERMINALS**

St. Bernard Port celebrates dedication of Chalmette Slip Rehabilitation Project



The St. Bernard Port, Harbor and Terminal District, in partnership with Associated Terminals, hosted the dedication ceremony for the Chalmette Slip Rehabilitation Project on May 14, marking a historic milestone in the restoration of one of the Mississippi River's most strategic maritime assets.

Originally constructed in 1907, the Chalmette Slip has been a cornerstone of maritime commerce in St. Bernard Parish for over a century. For the first time in 40 years, the slip is now fully operational, with all berths in active use thanks to the completion of the rehabilitation of sections A and F. This achievement represents the culmination of more than two decades of planning, beginning with the first rehabilitation efforts in 1997.

The project was made possible through the combined efforts of the St. Bernard Port, Volkert, Inc., Associated Terminals, and Boh Bros Construction. These partners worked tirelessly to bring the vision of a revitalized slip to life, enhancing the region's cargo-handling capabilities and supporting future growth.

The Chalmette Slip is a vital deepwater facility along the Mississippi River, one of the world's busiest and most economically significant waterways. Its central location within the Gulf South makes it a critical hub for domestic and international trade.

The only slip on the lowest Mississippi River, the Chalmette Slip plays a key role in the movement of general cargo, project cargo, and bulk commodities, reinforcing the region's strength as a logistics and industrial corridor.

Support from government leaders at both the state and federal levels was instrumental. Majority Leader Steve Scalise, in his role as Majority Whip, helped secure critical federal funding, alongside continued advocacy from Senator Bill Cassidy. The State of Louisiana invested \$15 million in Port Priority Program funding, demonstrating a strong commitment to maritime infrastructure and job creation.

"This project was a perfect example of the power of long-term vision and strong public-private partnerships," said Drew Heaphy, Executive Director of the St. Bernard Port. "The Chalmette Slip is not only a piece of our history — it's essential to our region's economic future and the broader Mississippi River system."

As the exclusive operator at the St. Bernard Port, Associated Terminals plays a critical role in managing the cargo-handling operations that drive the port's success. With a long-standing commitment to safety, innovation, and efficiency, Associated Terminals ensures that the Chalmette Slip and other port assets operate at the highest standards.

Gary Poirrier, Chairman of Associated

Terminals, noted: "We were honoured to work with the St. Bernard Port to bring the Chalmette Slip back to life. Its full restoration enhances not only our operations but also Louisiana's competitiveness in the global marketplace. We are proud to be the exclusive operator at this exceptional facility and look forward to continued growth alongside the port."

ABOUT THE ST. BERNARD PORT, HARBOR AND TERMINAL DISTRICT

The St. Bernard Port, Harbor and Terminal District is a vital link in the Lower Mississippi River's maritime network, serving as a gateway for cargo movement across the US and the globe. With deepwater access and commitment to economic development, the Port supports thousands of jobs and billions in trade activity throughout Southeast Louisiana.

ABOUT ASSOCIATED TERMINALS

Associated Terminals is one of the largest midstream stevedoring companies in the United States and serves as the exclusive operator at the Port of St. Bernard. The company provides cargo handling, logistics, and terminal services throughout the Gulf South and beyond. Associated Terminals is known for its operational excellence, safety culture, and dedication to workforce and community advancement.

Sennebogen launches timber handlers

pick-and-carry
724 G & 726 G
unveiled at
LIGNA



At the heart of the completely redesigned Maxcab comfort cab with new interior design is the new SENcon control system, which is highly customizable and allows quick access to all machine functions.

Just in time for LIGNA, the renowned trade fair for tools, machines and equipment for woodworking and processing in Hanover, SENNEBOGEN launched two new pick-and-carry timber handlers: the 724 G with 29t and the 726 G with 31t operating weight. The mobile timber handlers offer a tailor-made, state-of-the-art solution, especially for efficient log handling in medium-sized timber businesses and sawmills.

The reliable pick-and-carry timber handlers from SENNEBOGEN have been proving themselves in demanding practical use for decades.

Now, not only has the 723 E been relaunched in the new, 6th machine generation as the 724 G, but the product range has also been supplemented by the slightly larger 726 G. With an operating weight of 31t, this closes the existing gap to the 34-tonne 730 E.

PROVEN PICK-AND-CARRY CONCEPT TRANSFERRED: SAFE AND EFFICIENT

With a stacking height of up to 9m and load capacities of up to 3.7t at 10.5m radius for the 724 G and 4.6 t for the 726 G, the new mobile material handlers can not only stack high, but can also reload and sort quickly and safely.

In direct comparison to wheel loaders and high-lifter solutions, the proven SENNEBOGEN pick-and-carry concept,

which has now been used for the first time in this machine size, not only ensures even more safety in the log yard, but also enables optimum use of the available space thanks to its high manoeuvrability.

The pick-and-carry machine concept means that the boom linkage is positioned behind the centre of the machine.

This ensures that the centre of gravity of the material handler is close to the centre of the slewing ring. The weight of the machines is ideally distributed and a small rear ballast is sufficient to compensate, making the machine more compact and manoeuvrable. This allows fast handling in narrow pile aisles and shorter travel distances without time-consuming maneuvering — for efficient processes in the sawmill.

Added to this is the resulting increase in safety, which is not only due to the elimination of complex maneuvering, but above all due to the clear view from the cab. This is because the rear-hinged boom arm gives the driver a clear view to all sides. The rigid cab elevation also ensures optimum visibility from the cab — even when working on high piles and when unloading trucks.

STRONG AND STABLE WHEN MANOEUVRING AND LOADING

The 724 G is powered by a 123kW and the 726 G by a 129kW Cummins Stage V diesel engine, which can also run on HVO fuel. Thanks to the stepless all-wheel drive, the robust machines can travel quickly at speeds of up to 20km/h and, with their extra strong special axles, can also pull heavy, hydraulically braked trailers of up to 25t with ease. The new pick-and-carry material handlers are therefore ideally



The new 726 G pick and carry timber handler with 31t operating weight and 9m stacking height offers a tailor-made solution for efficient timber handling in medium-sized timber businesses and sawmills.

equipped for use on inclines and difficult ground. The eight tyres and optional stabilizing plates offer additional stability when loading heavy loads.

UPDATE TO THE G SERIES: INCREASED EFFICIENCY AND USER-FRIENDLINESS

As material handlers of the 6th generation, the SENNEBOGEN G series, the new pick-and-carry material handlers impress with maximum efficiency in use. This is achieved not only by the increased efficiency of the new two-circuit hydraulics, but also by the fuel-saving engine technology.

The redesigned Maxcab comfort cab offers outstanding driver comfort and, with its new interior design, meets all requirements for ergonomic and comfortable working. The new SENcon control system, which is based on a completely new technology platform, is at the heart of the cab redesign. It can be operated via a ten-inch touch display and allows quick access

to all machine functions. These can be individually configured and saved as part of driver profiles. This makes it possible to personalize the machine to the highest degree for the respective operator or application. The operator is also supported by intelligent assistance and diagnostic systems, ensuring safe and performance-optimized handling of the machine.

The service concept for the machines has also been further optimized and made particularly user-friendly. Clear and simplified access to all maintenance and service points makes regular maintenance work easier. The machines can also be conveniently refueled from the ground.

DOUBLE AT WORLD PREMIÈRE AT LIGNA 2025

Both new pick-and-carry material handlers, the 724 G and the 726 G, were presented to the public for the first time at LIGNA 2025 in Hanover.



Thanks to the SENNEBOGEN pick-and-carry concept used for the first time in this machine size, the 724 G timber material handler is particularly compact and manoeuvrable in operation.

Length x width x height

Bagging equipment & FIBCs

Tamtron's big bag filling solutions.



Jay Venter

Customized big bag weighing and filling solutions for modern bulk material handling

In the dry bulk industry, efficient and accurate material handling is paramount, writes *Tamtron Group*. Whether it's fertilizers, metal concentrates, pellets, or cereal products, packaging and weighing need to be seamless, precise, and adapted to the specific requirements of both the material and the production process. Tamtron, a Finnish weighing technology specialist with a long track record across various industrial sectors, designs and manufactures tailor-made big bag weighing and filling solutions for commercial and non-commercial applications.

A TAILORED APPROACH FOR EVERY INDUSTRY

Tamtron's big bagging solutions are trusted across the food, chemical, construction,

and metallurgical industries. The company has delivered hundreds of systems across Europe for bagging all types of dry, free-flowing materials — from sugar, cereal flakes, and fertilizers to metal concentrates like copper, cobalt, and nickel. Tamtron's flexible design approach enables each system to be adapted precisely to the customer's needs and operational environment.

Whether the material is coarse or powdery, abrasive or sensitive to dust, Tamtron's solutions ensure smooth, clean, and controlled transfer into big bags. A detailed customer needs assessment precedes every project, ensuring the system design fits both the material's properties and the requirements for accuracy, traceability, ergonomics, and safety.

FROM DESIGN TO OPERATION: A COMPLETE SOLUTION

Tamtron provides an end-to-end service that covers everything from initial design to installation, modernization, and maintenance. Each bagging or unloading station is designed for optimal workflow and dust-free operation, using enclosed structures, integrated dedusting equipment, and easily changeable connection heads for big bags of varying sizes.

Work ergonomics and safety play a significant role in Tamtron's engineering approach. Bagging and unloading stations are developed to minimize manual effort, reduce spillage, and protect operators from dust or material exposure.

BIG BAG FILLING STATIONS

Big bag filling stations are used for packing intermediate or final products. Sometimes, weighing is not required if the filling level is monitored by other means. However, when precision is essential, such as in commercial trade, Tamtron equips stations with certified weighing sensors and automation for exact dosing and compliance with commercial standards.

Filling systems can be equipped with dosing devices, top buffer tanks, conveyors, fluidization components, and automatic bag transfer systems for added control.

BIG BAG UNLOADING STATIONS

Unloading systems, often installed at the front end of the production line, enable smooth discharge of materials from big bags into process lines. Tamtron offers unloading solutions, including pneumatic bag massagers, lump crushers, and buffer tanks, which are especially useful for poorly flowing or compacted materials. Options include integrated weighing heads and data transfer to process control systems, ensuring full traceability and automation

compatibility. Each unloading head is designed for fast changeovers and universal compatibility with different bag types and sizes. Sealing and containment are core priorities in the design to ensure a dust-free and safe working environment.

LEGAL-FOR-TRADE WEIGHING — WHEN ACCURACY HAS A COMMERCIAL IMPACT

Tamtron also supplies CE-marked big bag scales for legal-for-trade use, where the weighing data directly determines the value of the goods. These certified scales comply with the EU-type examination certificate and relevant metrological standards. The distinction between commercial and non-commercial weighing is essential:

- ❖ **Commercial weighing:** produces receipts that serve as billing documentation. High precision is required (e.g., ± 50 g at 1,000 kg).
- ❖ **Non-commercial weighing:** used for internal control or process monitoring but unsuitable for billing.

Designing and certifying commercial-grade scales requires in-depth knowledge of legal requirements, automation

integration, and safety standards. Tamtron ensures that all its commercial weighing systems meet the applicable EU directives and local metrology regulations.

MODERNIZATION AND COMPLIANCE

Tamtron also offers modernization services for facilities operating with outdated or manual systems. Old big bagging stations can be upgraded to fully automated systems that meet current safety and certification requirements. This includes replacing outdated sensors with certified alternatives, updating control systems, and bringing the whole setup up to standard.

CONCLUSION

As industries demand more precise, safe, and automated material handling, Tamtron's customized big bag weighing and filling solutions deliver reliability, compliance, and operational efficiency. Whether you're looking to modernize existing equipment or design a new fully automated station from scratch, Tamtron's expertise ensures optimal results for any dry bulk environment.

Bag & Bulk Handling –supplying Africa with quality bagging/blending machines

South African company, Bag & Bulk Handling (PTY) Ltd. (BBH), brings specialists knowledge in handling hard-to-handle commodities, ensuring safe, efficient, precise packaging and weighing solutions. Operating from as early as 1999, and celebrating its 25th year anniversary in June 2025, BBH

specializes in the design, fabrication and supply of high-quality bagging/blending machines throughout Africa.

BBH'S EXPERTISE INCLUDES:

- ❖ **Material flow and handling solutions:** BBH designs systems that

accommodate challenging materials such as fine powders, corrosive chemicals or aerated substances, preventing blockage and product loss.

- ❖ **Customizable weighing & bagging technologies:** BBH's adaptive software and specialized feeding

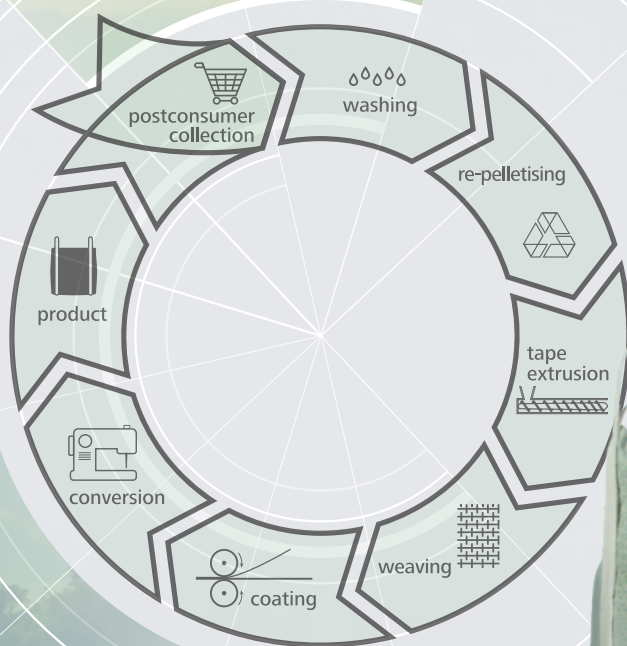


BBH Fabrication facility in South Africa

Fertilizer dual weighing system — Namibia



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- Save costs by replacing virgin material with recycled PP
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- Closed loop system ensures top quality

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mechanism (eg, augers fillers, vibratory feeders) ensure accurate weighing and consistent flow for materials with poor flow characteristics.

- ❖ **Compliance & safety standards:** the company provides solutions that meet industry-specific regulations for handling sensitive materials, including food-grade, pharmaceutical and chemical safety requirements.
- ❖ **End-to-end support & consultation:** BBH works closely with customers to assess material properties, recommend the best handling techniques and optimize packaging processes for safety and efficiency.

INDUSTRIES

BBH's multi-purpose packaging machinery is engineered to meet the diverse packaging needs of the fertilizer, breweries, animal feed, sugar, maize, pulses and many more industries.

Offering efficiency, precision, and flexibility, this advanced packaging system is a reliable solution for businesses that are seeking high-quality packaging for their products.

"We operate in a competitive industry with several companies offering bagging and weighing solutions," says Neale Rampono, Founder and Systems Consultant at BBH. "While there are other providers in the market, we differentiate ourselves through precision, efficient and exceptional customer support. Our focus on customized solutions, reliability and long-term partnerships allows us to stand out and deliver greater value to our clients."

BAGGING AND WEIGHING UNITS

According to Rampono, "BBH currently has two very good sellers, namely our Gross weigher and Net weigher. Both these weighers are known for their accuracy, reliability and repeatability — meaning each bag weighs the same. Customers opt for these lines due to its speed, user-friendliness, durability and cost saving. Both these units can weigh from 10kg to 1 metric tonne on the same line."

Additionally BBH's entry-level bagging machines are compact, user-friendly packaging solutions designed for small to medium-scale businesses that require efficient and consistent bagging of products. These machines automate the process of weighing, filling and sealing various types of products into bags, optimizing production while minimizing labour and packaging costs. They are ideal for startups, local businesses, and companies looking to upgrade from manual packaging methods.



Batch blending system - Mozambique

BATCH & CONTINUOUS PLANTS

Whether a customer requires a batch packaging system for smaller runs, or continuous for high volumes, BBH is able to supply them with the right system that will ensure quality, repeatability and accuracy, and enable them to meet their company goals. BBH has also designed and fabricated a system that does both Batch and Continuous blending on the same line — refer to image 1.

BATCH BLENDING SYSTEMS

Batch blending machinery is a type of equipment or system used in various industries to mix and blend multiple components or ingredients together in discrete, controlled batches. It is commonly used in processes where precise proportions and thorough mixing of ingredients are crucial for producing high-quality products. BBH's batch blending systems are equipped with advanced loadcells and controllers that ensure precise quantities of each ingredient that is added to the mixing vessel, guaranteeing consistency in the final blend.

CONTINUOUS BLENDING SYSTEMS

The company's systems are designed to support continuous production lines, providing efficiency and speed for high volume packaging requirements. This machinery excels in delivering consistent packaging results in continuous manufacturing processes.

PACKAGING CONTROLLER

BBH's packaging controller, with advanced features like reporting, wireless communication and customized software is designed to optimize packaging processes in various industries. It combines technology and tailored solutions to enhance efficiency and customer satisfaction.

NW6300 — NEW RANGE OF AFFORDABLE & EFFICIENT CONTROLLERS

This controller's user-friendly interface empowers customers to:

- ❖ Effortlessly manage and monitor all aspects of their bagging operations.
- ❖ Quickly alter settings for weight, bag size, and more with a few simple taps.
- ❖ Easily calibrate and reset equipment for optimal performance.
- ❖ Gain valuable insights into production data and identify areas for improvement.

Read more about the new NW6300 controller on page 62 of the March 2025 issue of *Dry Cargo International*.

MAINTAINING EXCELLENCE

"We maintain high standards," explains Rampono, "through a combination of ongoing training, quality monitoring and continuous improvement." The company's approach includes:

- ❖ **Comprehensive staff training** — "Our team undergoes regular training in machine operations, maintenance and safety protocols to ensure they stay up to date with industry advancements," says Rampono.
- ❖ **Quality control & testing** — each unit undergoes rigorous testing before delivery, to ensure accuracy, reliability and compliance with performance standards.
- ❖ **On-site and remote support** — "We provide training sessions for operators to maximize efficiency and troubleshoot issues quickly," elaborates Rampono. Remote assistance is also available via a phone call for real time guidance.
- ❖ **Customer feedback and continuous Improvement** — BBH actively collects customer feedback to refine its products and services, ensuring it continuously enhances performance and user experience.
- ❖ **Compliance with Industry standards** — BBH's equipment is designed to meet regulatory and safety requirements, ensuring reliable operation in various industries, including food, chemicals and construction.

Premier Tech Systems and Automation unveils latest innovative air valve bag filling machine



Premier Tech Systems and Automation announced its most recent launch of its VPF Series air valve bag filling machine, now re-engineered for enhanced performance.

This fully automatic equipment has been redesigned to enhance productivity and ensure precise handling of various materials, making it ideal for the food and chemical industries.

Premier Tech Systems and Automation's latest innovation features 60% fewer moving parts and less spare parts needs, reducing maintenance cost and downtime.

"We are proud to present a product that embodies three years of intensive research and development. This is just the beginning of our commitment to continuous innovation and enhancement. As the first in a series, this product is designed to secure a strong future in valve bagging, offering exceptional value to our clients while positioning ourselves as a key player in the market," says Simon Roy, president and chief operating officer of Premier Tech Systems and Automation.

This cutting-edge machine boosts operational efficiency and reduces maintenance efforts, offering a quick return on investment (ROI). Its intuitive design requires minimal training and offers easy access for cleaning, ensuring a seamless operator experience. The re-engineered VPF-3000 features a new bag opener, a robotic bag applicator, and on-spout sealing

with a real time seal detection system, ensuring top operational consistency and product integrity.

The VPF-3000 handles a wide range of products, including powdered ingredients, flour, spices, grains, pellets, and chemical materials such as fine chemicals and fertilizers. Its high-speed air packer ensures clean, dust-free operation, ideal for high-volume manufacturers.

For long-lasting durability, the air valve packer's rugged design ensures efficient performance and long-term reliability. Premier Tech proudly meets the highest standards for the powder industry with the VPF Series, delivering exceptional performance.

The company's machines are designed to minimize downtime, ensure cost savings, and deliver consistent product quality. They also require less maintenance and reduce long-term costs.

"We are proud to manufacture the VPF in Salt Lake City, Utah," says Dale J. Tortorich, site director and business development lead, Salt Lake City at Premier Tech Systems and Automation. He continues, "Our plant is now focused on increasing production capacity to meet the diverse needs of businesses nationwide, ensuring we can be part of the solution for companies seeking to buy locally."

This aligns with Premier Tech Systems and Automation's strategic plan to establish

a strong presence in the USA, with over \$50 million dedicated since 2009 to enhancing its facilities across the country. Premier Tech Systems and Automation continues to support the local American economy by creating quality jobs and ensuring compliance with American safety, quality, and regulatory standards.

ABOUT PREMIER TECH SYSTEMS AND AUTOMATION

As a world leader in packaging and processing equipment manufacturing, Premier Tech Systems and Automation harnesses the full potential of robotics and automation, helping manufacturers optimize their operations while prioritizing the safety of their teams.

With over 100 years of expertise and know-how in the automation industry, supported by flagships brands CHRONOS™, KOCKUMS™, SLOOTWEG™ and PRAIRIE™, the Systems and Automation business group of Premier Tech always goes above and beyond to exceed client expectations in weighing, feeding, bagging, palletizing and load securing, while also offering design and agricultural engineering services.

Driven by a commitment to enhancing client experience and fostering growth, Premier Tech team members offer services such as training, field service, spare parts, upgrades, and 24/7 technical support.

Polimak's Mobile Big Bag Discharge and Loading Systems

In various industrial plants, bulk solids in powder and pellet form are stored and transported in big bags. Typically, these materials are moved using bulk tanker trucks, ensuring an efficient and dust-free transportation process. However, the process of loading and discharging bulk solids can be challenging, mainly due to the logistical or equipment limitations that make transferring materials from big bags to silos at the destination difficult, leading to inefficiencies and delays. This issue, along with challenges such as transportation via ships and trains and intermediate storage, emphasizes the need for effective equipment to streamline these processes.

Polimak's Mobile Big Bag Discharge and Loading System provide a solution to these logistical obstacles by ensuring smooth, dust-free handling of bulk materials. Designed to be mobile and versatile, our systems offer a sustainable, safe, efficient, and cost-effective way to discharge big bags and load bulk tanker trucks, especially in situations where traditional methods are not practical. By improving the material handling process and reducing downtime, our mobile solutions help industries optimize their operations, enhance productivity, and simplify the complexities of bulk solids transportation.

ADVANTAGES OF THE MOBILE BIG BAG DISCHARGE AND LOADING SYSTEM

- ❖ **Ideal for big bags:** specifically designed for handling dry bulk materials stored in FIBCs, enabling efficient discharge and loading operations with minimal effort.
- ❖ **Low dust emission:** ensures minimal dust release during loading and unloading, enabling a cleaner and safer workspace.
- ❖ **Efficient operation:** engineered for

optimal performance across a wide range of industrial applications, ensuring consistent, reliable results and maximum operational efficiency.

- ❖ **High protection standards:** delivers superior protection for dry bulk materials, the industrial plant, and operators, ensuring a safe and secure environment throughout the operation.
- ❖ **Economical:** cost-effective design that reduces operational costs by increasing efficiency and minimizing material loss.
- ❖ **Robust construction:** built with durable materials to withstand demanding conditions, providing long-lasting performance and reliability in industrial environments.

COMPONENTS OF THE SYSTEM

BIG BAG DISCHARGE HOPPER

Used to discharge big bags and transfer material to the screw conveyor. Available options include a cutting knife for quickly opening the big bags, fluidizing air jets to assist with material flow inside the hopper, and a vibrating engine to ensure smooth product flow.

SCREW CONVEYOR

Facilitates the transfer of material from the cyclone to the tanker loading bellow. The conveyor can be repositioned when the system is moved to another location. It is powered by an electric motor with a gearbox, and the elevation is adjusted with screw jacks.

SCREW JACKS

The screw conveyor and telescopic chute can be raised and lowered according to the configuration's requirements. During on-site setup, the screw jacks elevate the

screw conveyor. After loading is completed, the screw jacks are used to lower the conveyor back to its original position.

LOADING BELLOW

The telescopic chute or loading bellow is used for safe, dust-free loading of bulk tanker trucks. It is driven by an electric motor with a gearbox.

DUST COLLECTION SYSTEM

Captures the dust generated during the tanker truck loading process. The dust-laden air is filtered, and clean air is released, while the dust is collected in the filter and transferred to the screw conveyor.

AIR COMPRESSOR

Provides the pressurized air required to operate the dust collector. It has a maximum pressure of 6 bars.

ELECTRICAL CONTROL PANEL

Controls all components of the system. It can be operated using a wired or wireless remote control, with the option to manage all functions from the electrical panel.

MOBILE CHASSIS

The entire Mobile Big Bag Discharge and Loading System is mounted on a mobile chassis, making it transportable to different locations using a towbar, forklift, or vehicle. The chassis is equipped with four wheels and swivel jacks to provide stability during truck loading.

ADDITIONAL OPTIONS

- ❖ **Air jets:** to aid material flow within the hopper.
- ❖ **Vibrator:** to ensure fast and complete material flow.



WORKING PRINCIPLE OF THE PORTABLE BULK HANDLING SYSTEM

SYSTEM SETUP

- ❖ The Mobile Big Bag Discharge and Loading System is positioned near the bulk truck to be loaded.
- ❖ The screw conveyor is elevated to the required height using screw jacks, ensuring the loading bellow connects to the tanker's inlet port.

BIG BAG HANDLING

- ❖ The big bags are transported to the loading site using a forklift, towbar, or vehicle.
- ❖ The big bags with flat bases are placed on the discharge hopper, which is equipped with an inbuilt knife.
- ❖ The big bag cutting knives cut an opening below the bag for material release, or in the case of bags with emptying spouts, the operator unties the spout to release the material.

MATERIAL TRANSFER

- ❖ The bulk material is transferred from the hopper to the screw conveyor.
- ❖ The screw conveyor conveys the material to the loading, which then fills the bulk truck.

LOADING BELLWS OPERATION

- ❖ The loading bellows are lowered at the start of the loading process.
- ❖ The bellows automatically stop when it reaches the tanker's inlet, and a polyurethane-coated discharge cone seals the vessel inlet to prevent dust emissions.
- ❖ Material flows freely through the inner side of the bellows into the tanker.

DUST COLLECTION

- ❖ Dust emitted during loading is captured by the dust collection system, which is connected to both the loading bellows and the big bag discharge hopper.
- ❖ The filter units inside the system trap floating dust, which is then returned to the hopper by means of pulse jet valves.

MONITORING OF THE LOADING PROCESS

- ❖ The level sensor at the outlet of the loading bellows monitors the material level inside the bulk tanker.
- ❖ The system automatically stops loading when the tanker is full, and the loading bellows retract.

POST-LOADING PROCESS

- ❖ Once loading is complete, the operator uses the control panel to lower the screw conveyor back to its original position using the screw jacks.
- ❖ The system is designed to ensure safe and dust-free loading at all times.

POLIMAK: RELIABLE AND INNOVATIVE PORTABLE BULK HANDLING SOLUTIONS FOR DIVERSE INDUSTRIES

Polimak's portable bulk handling solutions are engineered to efficiently discharge big bags and enable dust-free loading of bulk tanker trucks, serving the needs of various industries. The system is easily transportable, whether towed by a forklift or towbar, ensuring safe and convenient relocation.

With 45 years of experience and technical expertise, Polimak provides sustainable, durable, high-performance, safe, and cost-effective solutions for a wide range of industries, including food, chemicals, mining, plastics, and cement. The company's extensive product range offers customized solutions to overcome the challenges posed by portable bulk handling.

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Cement and building product industries benefit from new market approach with The Portland Company's rotating PANTHERA-PACKER PVT®

The Portland Company, offering the world's first Assemble to Order (ATO) packing equipment product line in partnership with Haver & Boecker, offers the PANTHERA-PACKER PVT® packer*. This predefined rotary packing machine provides a standardized approach to filling industrial bulk materials in valve bags that range from 25kg to 50kg in size. Designed with robust and proven slide gate dosing technology, the PANTHERA-PACKER PVT is a high-quality, yet quick and very cost-effective bag filling solution, designed with state-of-the-art components for the cement and building materials industries. The Portland Company's ATO approach is ideal for plants that require quick installation without additional customizations.

"The Portland Company was developed to provide customers with high-quality and reliable packing solutions in a more price-and-speed-sensitive, preconfigured machine," Francesco Ferrandico said, The Portland Company's managing partner. "We are combining German engineering with Italian design to form a packing line that offers customers quality they can rely on while cutting down on lead times."

The PANTHERA-PACKER PVT is available in configurations of 8, 12 or 16 spouts in a simplified design that is easy to operate and maintain. The 8-spout model has the capacity to fill up to 3,000 bags per hour depending on the bag size and material to be bagged. Dedusting at the spout expels contaminants and a well-proven dosing sliding gate ensures accurate dosing of material and a clean filling process. A specially designed three-position cylinder provides the precision at the heart of the filling system. The PVT's weighing system is the MEC® 4.0, provided by Haver & Boecker. It maintains accurate package fill amounts to optimize profitability. The PANTHERA-PACKER PVT is a preconfigured machine for quick and economical installation without sacrificing quality. The equipment is manufactured in Oelde, Germany



and contains original Haver & Boecker components for all primary functions. The PVT can be easily upgraded for a simple pathway to growth.

The Portland Company places a high degree of focus and importance on service and attention to the customers' full operational needs. The signature PROcheck approach centres on keeping customers' operations running at peak performance. PROcheck can identify systems that will help automate the packing process, oversee equipment currently in use and offer solutions to configure the line for improved efficiency and reduced labour. In this way, the PANTHERA-PACKER PVT fits within a larger packing triangle of products, bags and machine to give the customer a comprehensive experience with the packing process and ensure a steady, reliable and efficient material flow. The Portland Company's testing centre in Oelde, Germany, complements this flow triangle by testing bags to ensure the right machine settings for each bag or help to recommend the right bag.

ABOUT THE PORTLAND COMPANY

The Portland Company (TPC) offers a product line created by the partnership between Haver & Boecker and Francesco Ferrandico. TPC combines more than 135 years of Haver & Boecker's industry experience with Italian design to form a new, unique ATO approach to packing. For producers in the cement and building products industries, ATO means they can configure predefined machines and accessories according to output requirements to align with their specific project requirements. With ATO, The Portland Company targets delivery and installation timelines of just three months at very competitive prices. All of The Portland Company's products are manufactured using the same supply chain as Haver & Boecker main products in Germany. Additionally, the parts and service are provided by the same service structure, ensuring that neither quality nor performance is compromised.

Dinnissen introduces its own stainless steel lift for pallets, IBCs, and FIBCs

This innovative stainless steel lift saves space, accelerates work processes, and minimizes safety risks through automated, safe vertical movement of raw materials and goods.

Designed to meet strict hygienic standards and made entirely of stainless steel, the lift guarantees full reliability.

A PROJECT THAT LAID THE FOUNDATION FOR THIS INNOVATION

The idea for the stainless steel lift emerged during a project in the United States. Dinnissen built two mixing lines there for a major multinational in dietary supplements (collagen powder). During this project, Dinnissen specialists Frans Bakker and Melvin van Hilst noticed that the design was not sufficiently safe. Pallets with raw materials had to be placed on a platform at a height of eight metres, which involved significant risks. Back in the Netherlands, they decided to develop a safer solution together: a lift to safely elevate the pallets with raw materials.

The idea was immediately well received by the client. They searched for a supplier capable of delivering fully stainless steel lifts without hydraulics, due to stringent hygienic requirements.

However, the search brought no outcome. When it became clear that no suitable supplier could be found, Dinnissen decided to design and build the lifts themselves, fully tailored to the client's needs.

EFFICIENT AND SAFE TRANSPORTATION OF RAW MATERIALS

The stainless steel lift for pallets, IBCs, and FIBCs provides an efficient and safe way to move raw materials and products within a hygienic production environment. This innovative system meets the strict hygiene standards of the food industry, saves space, ensures safety, and accelerates work processes.

The lift's design is fully aligned with the highest safety and hygiene standards, with stainless steel as the primary material. Stainless steel is not only corrosion-resistant but also easy to clean, minimizing the risk of contamination. Moreover, the stainless steel lift is highly versatile: it can easily handle various product types, including pallets, drums, big bags, and sack goods.

NO HYDRAULICS, BUT RELIABLE MECHANICAL BELT DRIVE

Dinnissen has further enhanced the lift's



Dinnissen's new stainless steel lift for pallets, IBCs, and FIBCs provides an efficient and safe way to move raw materials and products within a hygienic production environment.

safety by opting for a mechanical belt drive instead of hydraulics. This not only improves hygiene but also makes the system more reliable and durable.

Additionally, the lifts comply with safety standards, such as CE certification, thanks to collaboration with the Liftinstituut in The Netherlands. This partnership ensures compliance and safe operation in industrial environments.

The fully stainless steel lift features its own control system, including LOTO provisions and fall protection, to ensure maximum safety. Everything is fully compliant with the EN 81-30:2010 regulations.

CUSTOM SOLUTIONS FOR EVERY STAINLESS STEEL LIFT

Dinnissen designs the stainless steel lift entirely according to the specific requirements of the customer. This includes considerations such as height, capacity, or the specific configuration of input and output routes. Dinnissen ensures that the lift seamlessly integrates into the production process.

The lifts can be built in various heights and have a lifting capacity ranging from 500 to 2,000 kilograms.

Dinnissen has already built several stainless steel lifts and is currently producing multiple units for various customers.



Revolutionizing sulphur handling with Siwertell technology: an Indian success story

The transformation of bulk sulphur handling at Paradeep in India, is testament to the impact of adopting innovative solutions; with each new installation, Siwertell ship-unloading technology is not just handling sulphur, it is handling a sustainable future

As the sun rises over India's bustling ports, a quiet revolution is taking place in how operators handle one of the world's most critical, but challenging, commodities: sulphur. Vital for the production of fertilizers that sustain India's agricultural heartlands, along with numerous other essential industrial processes, the efficient, environment-friendly, and safe handling of sulphur is paramount to sustainable growth.

Enter enclosed, screw-type Siwertell ship unloading technology, a name synonymous with innovation and reliability in dry bulk handling, including its capability to transform a port from an environmental, safety and efficiency perspective.

One of its most evident impacts is on the global import of bulk sulphur. Highlighting a notable success story, is the revolutionized sulphur import operations of Paradeep Phosphates Limited (PPL), part of the K K Birla Group and the OCP Group of Morocco.

PPL is one of India's leading private-sector stakeholders in phosphatic fertilizers. It currently has a total capacity of three million metric tons, of which 2.60 million metric tonnes are phosphates, with urea as the balance. The company has two large manufacturing units at Paradeep, Odisha and at Zuarinagar, Goa.

PPL's Paradeep terminal is in the Mahanadi River delta. Here, it takes deliveries of sulphur, muriate of potash (MOP) and rock phosphate, constituents of high-performing fertilizers. Key materials for boosting productivity in India's enormous centres of food production, which provide direct and indirect support for 70% of its population, according to the World Bank.



a solution that would not only enhance efficiency, but would also mitigate the risks associated with sulphur handling. Its journey led the company to Bruks Siwertell, and a customer partnership that would lead to the total transformation of one of India's major ports, Paradeep.

PPL did its homework. It visited a Siwertell sulphur-handling installation in Fremantle, Australia, where an operator had successfully been using a Siwertell ST 640-D ship unloader for discharging vessels of up to Panamax size.

The system is fully enclosed, submerging the counter-rotating inlet feeder beneath the level of the cargo, and enabling it to discharge entire shipments of sulphur without spillage, or dust clouds from avalanches within the ship's hold. Transfer points within the conveyor are also sealed to prevent fugitive sulphur dust.

BENEFIT HARD TO IGNORE

PPL saw the benefits of the use stainless-steel components throughout the dry bulk handling equipment to prevent corrosion and formation of ferrous oxide within the unloader. Furthermore, critical to all sulphur handling Siwertell ship-unloaders, is the Siwertell Sulphur Safety System (4S); developed by Bruks Siwertell from decades of proven industry installations.

The 4S system aims to minimize the risk of explosions during sulphur unloading. If an explosion does occur, it ensures the safety of operating personnel and the integrity of the machine by mitigating any potential damage.

The 4S comprises various safety functions such as fire prevention, detection, suppression, and extinguishment. It reduces the occurrence of an explosive atmosphere by minimizing dust generation. Also, sensors within the unloader stop its operation if hot and/or glowing material is

Like many, India is a country with growing agricultural needs, heavily reliant on these materials, and with consumption expected to rise significantly, efficient fertilizer import and handling processes are critical.

THE NEED FOR CHANGE

Traditional methods of sulphur handling, often involving grab cranes and bucket chains, have numerous drawbacks, including exposure to the elements, potential for environmental contamination, pollution and health hazards from the inhalation of sulphur dust.

The corrosive impact of sulphur on dry bulk handling equipment can also be hugely problematic, along with its volatility and explosive tendencies once confined. In response to these challenges, PPL embarked on a research project to identify

detected within the conveying line. A suppression system relieves any pressure in the conveyors and at the same time, a fire-extinguishing system activates to put out any fire.

PPL also decided that a rail-mounted ST 640-D unloader would be the right tool for the job, and in 2005, took delivery of its own, installed on the quayside at Paradeep.

What followed was the elimination of pollution both to air and sea, yielding a marked transformation for workers at the terminal, and a new era of port operations, consigning the clouds of yellow dust to the past.

The screw-type ship-unloader is able to seamlessly switch between its three essential dry bulk cargoes, handling sulphur at a continuous rated capacity of 1,600tph (tonnes per hour), rock phosphates at 1,300tph, and MOP at 1,000tph, without requiring any additional measures to be taken between shipments.

Not long after PPL's initial order, neighbouring terminal, the Indian Farmers Fertilizer Co-operative Limited (IFFCO) took note, and put in an order for a Siwertell ship unloader. Commissioned in 2011, it has replaced a grab crane previously used at the terminal, and now imports sulphur using its own ST 790-D unloader. This larger model handles bulk sulphur at a rate of 1,800tph, and rock phosphate at a rate of up to 2,100tph. Dust collectors at the unloader's transfer points further prevents the emission of dust to the surrounding environment.

A SUSTAINABLE FUTURE

The successful transformation of the port does not end there. In 2021, responding to yet further increases in demand, Paradeep became home to a third Siwertell ship-unloader when PPL placed its second order for a Siwertell ST 640-D. This was commissioned in 2023 and now, PPL has

the ability to unload sulphur at a rate of some 2,900tph, enough to empty a 60,000dwt bulk carrier in less than a day.

With the third endorsement of Siwertell unloading technology in Paradeep within the space of a decade, thanks to the state-of-the-art cargo handling technology, Paradeep and PPL can now meet its safety and environmental requirements, while leveraging ample additional capacity to support not only India's continuing role as an agricultural powerhouse, but its exciting future growth prospects.

The transformation at Paradeep is a testament to the impact of adopting innovative solutions. For port operators across India and beyond, following PPL's lead with Siwertell technology is a step towards a safer, more efficient, and environmentally sustainable dry bulk handling. With each new installation, Siwertell technology does not just handle sulphur; it is handling the future of dry bulk operations.

Siwertell ship-unloader ordered for high-capacity salt handling in India

Bruks Siwertell has secured an order from Reliance Industries Limited, India, for a high-capacity Siwertell 640 M-type continuous screw ship-unloader. The unit will be installed at Dahej in Gujarat and will offer efficient, environment-friendly salt handling for India's largest integrated petrochemical producer.

"Reliance is a new customer for us, and has extremely high expectations not only for the technology, but for what it will deliver to its Dahej operations," says Jan Karlsson, Sales Director, Bruks Siwertell.

Salt is a critical raw material in the production of chlorine, a key ingredient in plastics such as polyvinyl chloride (PVC), polycarbonates, polyurethanes, and epoxy resins. However, handling salt presents unique challenges due to its corrosive nature and tendency for compaction in the ship's hold. This typically results in additional wear-and-tear to dry bulk material handling, transportation and storage systems.

"We have extensive experience in salt handling and have developed our Siwertell technology to overcome these challenges," Karlsson explains. "For example, salt handling Siwertell ship-



unloaders are fitted with an optimized inlet feeder able to manage the corrosive properties of salt, and the significant digging forces needed to discharge it from the hold at high capacities."

The low weight and compact footprint of the new high-capacity Siwertell 640 M-type ship-unloader means that it can be easily accommodated onto the operator's existing jetty. Furthermore, its high capacity ensures the rapid discharge of salt from barges.

"We are used to meeting specific operational needs," Karlsson notes. "The Siwertell 640 M-type model can comfortably handle the annual salt intake volumes and accommodate high tidal fluctuations with an efficient through-ship operation. It is also very reliable, and has a totally enclosed screw-conveyor system, which minimizes any environmental impact from spillage or dust emissions."

The Siwertell unloader is planned as a break bulk delivery and will be assembled and commissioned onsite.

Sicilian port operator adds strongest Konecranes Gottwald ESP.9 mobile harbour crane to its fleet



The Fratelli Fazio Group has ordered a Konecranes Gottwald ESP.9 mobile harbour crane which is the first Generation 6 crane with 200 tonnes of lifting capacity delivered to Italy. The order was placed around half a year ago and the crane will be delivered to Sicily's Port of Augusta in Q3 2025.

Located on Sicily's east coast, the Port of Augusta is a key entry point into the EU's TEN-T core network of strategic transport corridors. It has a deep harbour accommodating vessels of all sizes.

For many decades, Fratelli Fazio Group has operated earlier-generation Konecranes Gottwald mobile harbour cranes at the port. This new 200-tonne capacity crane — the heaviest lifter in Konecranes' mobile harbour crane portfolio — will now increase its handling capacity of heavy general cargo, including project loads and wind power generators, as well its container handling.

The crane is equipped with external power supply to be electrified once the local infrastructure is set up. Two onboard diesel generator sets allow for full unplugged operation and redundancy. The crane comes with Konecranes TRUCONNECT® for remote monitoring, giving the Fratelli Fazio Group real-time data to support operations and predictive

maintenance. Compliance with Italy's latest standards for sustainability and digitalization makes the investment eligible for government incentives.

With its heavy lifting capacity and strong digital capabilities, the new crane supports high performance daily operations and long-term development. The investment reflects Fratelli Fazio Group's ambition to expand its port operations with equipment trusted by terminal operators around the world.

"This will be our first Generation 6 Konecranes Gottwald mobile harbour crane. It's a very important addition to our existing fleet. The investment strengthens our long-standing relationship with Konecranes, giving us the capability to handle even the most challenging cargo with confidence," said Gabriele Fazio, Procurement Manager, Fratelli Fazio Group.

"We're very happy that the Fratelli Fazio Group has decided to go ahead with this order, which builds on our long and collaborative relationship with the Augusta terminal. The deal also further confirms the strength of Konecranes across the broader Mediterranean region," says Gino Gherri, Regional Sales Manager, Konecranes Port Solutions.

This contract is part of Ecolifting, Konecranes' vision to increase its handprint

— meaning the beneficial environmental impact that can be achieved with its product and service portfolio — while reducing customers' carbon footprints. From eco-optimizing diesel drives, to hybridization and fully-electrified fleets, Konecranes will continue to do more with less.

A strong focus on customers and commitment to business growth and continuous improvement put Konecranes at the forefront of the material handling industry. This is underpinned by investments in digitalization and technology, plus its work to make material flows more efficient with solutions that decarbonize the economy and advance circularity and safety.

ABOUT KONECRANES

Konecranes is a global expert in material handling solutions, serving a broad range of customers across multiple industries. It consistently sets the industry benchmark, from everyday improvements to the breakthroughs at moments that matter most, because it knows it always find a safer, more productive and sustainable way. That's why, with around 16,700 professionals in over 50 countries, Konecranes is trusted every day to lift, handle and move what the world needs. In 2024, Group sales totalled €4.2 billion.



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Material build-up accelerates wear and can cause tracking problems.

Six keys to conveyor belt longevity



Jeremy Clark

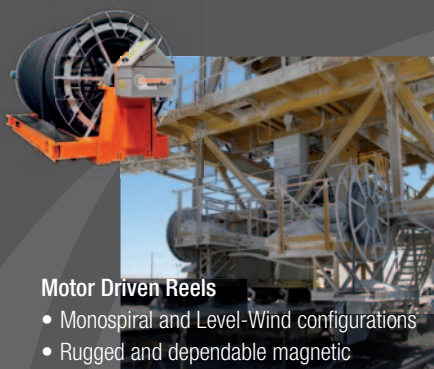
To provide true efficiency and genuine value for money, conveyor belts should run with little or no significant intervention for several years. Conveyor belts that require less maintenance, fewer repairs and longer replacement intervals have a much lower whole life cost. The mathematics are simple and undeniable. The keys to achieving these goals are clear and, fortunately, very manageable.

IT'S NOT WHAT YOU EXPECT, IT'S WHAT YOU INSPECT

You can have the best quality belts in the world, but stoppages will still occur unless the conveyor, including all its components, are inspected daily. Regular, preventative maintenance, good quality components and a clean working environment all help to prevent stoppages and extend conveyor belt life. Other factors include making sure

that any scrapers are correctly adjusted and that any drum linings are in good condition. Belt tracking is also important because a mis-tracked belt can catch on the conveyor framework. Again, cleanliness is vital because mis-tracking is often caused by material build-up on the bottom side of the conveyor belt or drums and pulleys.

A major cause of conveyor belt damage is the result of material becoming trapped.



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When lodged in part of the conveyor mechanism or simply finding their way between the belt and the drum, even small, sharp stones can puncture the belt cover. Larger objects can penetrate the carcass and cut the belt lengthwise. The first step in reducing the risk is to identify where foreign objects and rogue material is most likely to become trapped and take preventative measures such as installing skirts or screening for example.

Apart from increasing the chances of an object becoming trapped, waste build-up is a common cause of damage to idlers and drums, which can cause a lot of collateral belt damage. A significant proportion of damage is caused by incorrect installation of auxiliary equipment, damaged, protruding steelwork and components vibrating loose and ultimately becoming detached, all of which can be identified and dealt with through regular inspection.

THE WEAKEST LINK

The joints used to create a continuous loop are the weakest point of any conveyor belt. It is estimated that splice joint problems account for some 80% of unplanned repair stoppages. The cost of repairing splice joints including the cost of lost output is considerable but should not be necessary at all. The biggest causes of splice problems are shortcomings in the quality of the conveyor belt itself, the materials used to join the belt and the quality of the workmanship.



Double trouble — a damaged component and an unclean environment.

Low-quality rubber and poor adhesion between the inner plies and outer covers are both faults commonly found in the low-grade belts and make the job difficult even for the most skilled splicer. The cost of splice joint repairs and the associated lost output should always be included when calculating the whole life cost of a conveyor belt.

The most common splice joint method is the step splice, which requires the removal of one of the layers of fabric plies so that the two belt ends can be overlapped and then either cold glued or

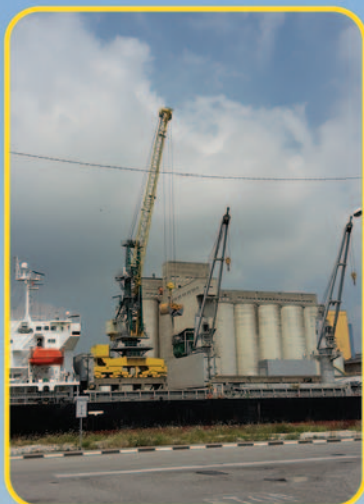
hot vulcanized together. It is not physically possible to join a belt without some loss of longitudinal tensile strength, but the biggest disadvantage of the step splice is that it always creates a proportional loss of tensile strength equivalent to one ply. For example, a 3-ply step joint can only achieve a maximum longitudinal tensile strength of 67%. This effectively means that in a typical multi-ply belt containing three plies or more, at least one ply exists purely to compensate for loss of the longitudinal strength incurred by making a step splice joint.



The cost of splice repairs and lost output is considerable.

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No. of plies	Maximum % tensile strength
1	90%
2	50%
3	67%
4	75%
5	80%

One of the best ways to increase splice reliability is to employ the finger splice method, ideally by changing to the new generation of super-strength single and dual-ply belts pioneered by Fenner Dunlop.

As can be seen in the table above, in comparison to the loss of up to 50% in a step splice, the finger splice method retains up to 90% of the 'static' tensile strength, which is, of course, an enormous advantage. Another crucial advantage is in dynamically stressed conditions when the belt is working and underload because the finger splice is vastly superior to a stepped splice in terms of resistance to dynamic failure. A finger splice joint is also much flatter, so it is not prone to being damaged by scrapers.

WEAR RESISTANCE

Conveyor belts used to carry a variety of dry bulk materials need to have the type of rubber (cover grade) that can 'multi-task'. First and foremost, the abrasive wear properties of all abrasion resistant conveyor belts should be at least DIN Y standard (ISO 4649/DIN 53516 test maximum 150mm³ loss) to achieve reasonable economic longevity (whole life cost). If particularly sharp, abrasive materials are sometimes conveyed then higher-grade DIN X covers (maximum rubber loss under testing of 120mm³) may be more suitable because as well as abrasive wear, it is also more resistant to cutting and gouging. However, a good quality DIN Y rubber used by a premier brand manufacturer is often more wear resistant than a DIN X grade rubber produced by an 'economy driven' manufacturer.

OIL AND CHEMICAL RESISTANCE

In terms of their effect, the wide variety of oils and/or corrosive materials contained within the different types of dry bulk cargo

such as grains, fertilizers and biomass, pose the single biggest challenge. Oil absorption causes a dramatic decrease in the ability of the rubber to withstand abrasive wear. As the rubber softens it loses tensile strength, becomes prone to ripping and tearing and swells and distorts.

There are two distinct sources of oils that damage rubber — mineral and vegetable/animal. Good quality oil-resistant belts should have outer covers that are based on a combination of SBR (Styrene Butadiene Rubber) and NBR (Nitrile butadiene rubber). Because of the high cost of nitrile butadiene, manufacturers who operate on the principle of price competitiveness rather than performance and longevity, not only use lower-grade nitrile but also use it in minimal quantities.

Mineral oil tends to be much more aggressive than most vegetable oils, so a full Nitrile butadiene rubber-based synthetic rubber is required. The greater the concentration of nitrile within the polymer,

then the greater resistance there is, not only to oil but also to corrosives because nitrile provides protection against many aggressive chemical elements. Although premier brand quality belts come with a higher price tag, they can quite easily achieve double or treble the lifetime of so-called 'economy' belts and up to 500% greater lifetime compared to imported belts. Ironically, the price invariably reflects the difference in performance and longevity that you can expect.

THE CARCASS

The inner carcass is the backbone of every conveyor belt. It provides the inherent characteristics such as its tensile strength and elongation (elasticity or 'stretch' under tension). Its importance should therefore never be underestimated. Most rubber multi-ply and single-ply belts use synthetic fabrics, most commonly a combination of polyester and nylon (polyamide), referred to as 'EP'. The basis of using a mix of polyester and nylon fabric in multi-ply belts is that it has the best balance of mechanical properties including allowing a conveyor belt to run straight, to trough, to flex round pulleys and drums, stretch, provide transversal rigidity, longitudinal strength and much more besides. Unless the weave pattern has been very specifically designed, the use of totally polyester fabric compromises a number of essential mechanical properties.

Unfortunately, an increasingly common deception employed by less scrupulous manufacturers, traders and importers is to supply belts that have totally polyester (EE) fabric plies in a carcass that is claimed to be an EP (polyester/nylon mix) construction. As a result, although the longitudinal

The price invariably reflects the quality and durability.





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strands of the fabric may be sufficient to achieve the required tensile strength, rip and tear resistance are reduced, and elongation (stretch) is lowered. This in turn can cause problems with transition distances and a general inability to accommodate the contours of the conveyor and its drums and pulleys, ultimately lead to premature failure.

The sole reason for this deception is that polyester costs some 30% less than nylon. This is significant because, after rubber, the fabric is the highest cost component. Consequently, using lower cost polyester fabric is a big help towards achieving the perception of a lower 'like for like' price. This particular trait is most often found in belts imported from Southeast Asia.

OZONE AND ULTRAVIOLET RESISTANCE

This final key to belt longevity is the most common but least recognized cause of premature belt deterioration, which is the degradation caused by ozone and ultraviolet light. At ground level, ozone becomes a pollutant that is created by the

photolysis of nitrogen dioxide (NO_2) from automobile exhaust and industrial discharges. The reaction, known as ozonolysis, affects the molecular structure of rubber. Exposure, which is unavoidable, increases the acidity of carbon black surfaces and causes reactions within the molecular structure of the rubber. This has

several consequences including surface cracking and a marked decrease in the tensile strength, all of which accelerates the wear and general degradation of the rubber.

The first visible sign is cracks in the surface of the rubber. These steadily grow until they complete a 'circuit' and the product separates or fails. Its 'partner in crime' is ultraviolet light from sunlight and fluorescent lighting, which accelerates rubber degradation by producing photochemical reactions that promote the oxidation of the rubber surface resulting in a loss in mechanical strength. These processes begin as soon as rubber is vulcanized.

Damage can easily be prevented by including antioxidants in the rubber compound but the overriding desire to gain a price advantage means that this life-prolonging option is widely ignored. Laboratory testing reveals that up to 90% of belts sold in Europe, Africa and the Middle East are unprotected. The simple answer is to always insist that the belt you are considering buying is guaranteed to be 100% ozone resistant according to EN ISO 1431 test methods.

CONCLUSION

Aside from regular inspection and preventative maintenance, the use of low priced, low-grade belting is the primary cause of avoidable stoppages and premature belt replacement. It is physically impossible to make a belt that can stand the test of time without frequent intervention and provide a cost-effective operational lifetime using anything less than top-grade raw materials. Belts produced to compete on price rather than reliability and longevity will always prove much more costly in the end.



Not what they claim - some belts are supplied totally polyester (EE) fabric plies in a carcass declared as being an EP (polyester/nylon) carcass.

Belts that are not fully resistant to ozone and UV have a much shorter lifespan.



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Clean Shipping Commitment

The need to improve sustainability in the shipping industry is accelerating. The global industry must cut carbon emissions, protect marine biodiversity and leverage the use of data for smarter decision-making.

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With the earth in mind environmental bulk handling

Jay Venter

Engineered for the environment: Weba Chute Systems supporting sustainable bulk materials handling

As environmental concerns take centre stage in global bulk materials handling, operators across the dry cargo industry are increasingly prioritizing equipment that offers not just performance, but sustainability. South Africa-based Weba Chute Systems, a pioneer in custom-engineered transfer point solutions, is demonstrating how thoughtful design and long term operational reliability can contribute meaningfully to greener, cleaner and more efficient materials handling.

At the heart of Weba Chute Systems' value proposition is its philosophy of engineered-for-purpose solutions. Unlike

off-the-shelf chute systems that often lead to excessive wear, spillage and energy wastage, each Weba chute is tailor-made to suit the specific operational parameters of the application. This results in a smoother controlled flow of material that not only reduces dust and material degradation but significantly cuts down on maintenance requirements and associated energy consumption.

SUSTAINABILITY BY DESIGN

"A key sustainability advantage of our systems is their ability to reduce environmental impact at multiple levels,"

explains Mark Baller, Managing Director of Weba Chute Systems. "This includes minimizing dust emissions, curbing spillage and reducing the overall wear on both the chute and downstream equipment, all of which contribute to cleaner and more energy-efficient operations."

Dust is a persistent challenge in bulk handling, especially in dry cargo operations, where it affects air quality, poses health risks and increases clean-up costs. Weba Chute Systems are designed to control the velocity and direction of material flow while minimizing impact zones which significantly limits the generation of airborne particles. The result is a measurable improvement in workplace safety and environmental compliance.

In addition, the company's ability to limit spillage at transfer points contributes directly to site cleanliness and operational efficiency. Spillage often leads to unnecessary material loss and increased conveyor downtime — both costly and environmentally detrimental outcomes. By ensuring smooth and controlled material transitions, Weba Chute Systems help clients maintain cleaner operations and avoid costly material waste.

EXTENDED LIFESPAN, REDUCED CONSUMPTION

Another sustainable benefit of Weba



Chute Systems is the extended lifespan they offer - both for the chutes themselves and for associated equipment such as belts and crushers. "When material hits a surface at high velocity, it can cause rapid wear and premature failure," says Baller. "Our designs reduce direct impact and abrasive wear, significantly extending maintenance intervals and reducing the frequency of component replacement."

This design-driven durability translates directly into resource savings. Less frequent wear part replacement means reduced demand for raw materials, less energy used in manufacturing and logistics and a lower overall carbon footprint for the operation.

Furthermore, reduced maintenance requirements equate to fewer shutdowns, less labour-intensive intervention and lower reliance on heavy equipment, all of which align with customers' sustainability goals and reduce total cost of ownership, a key driver for all operators within the sector.

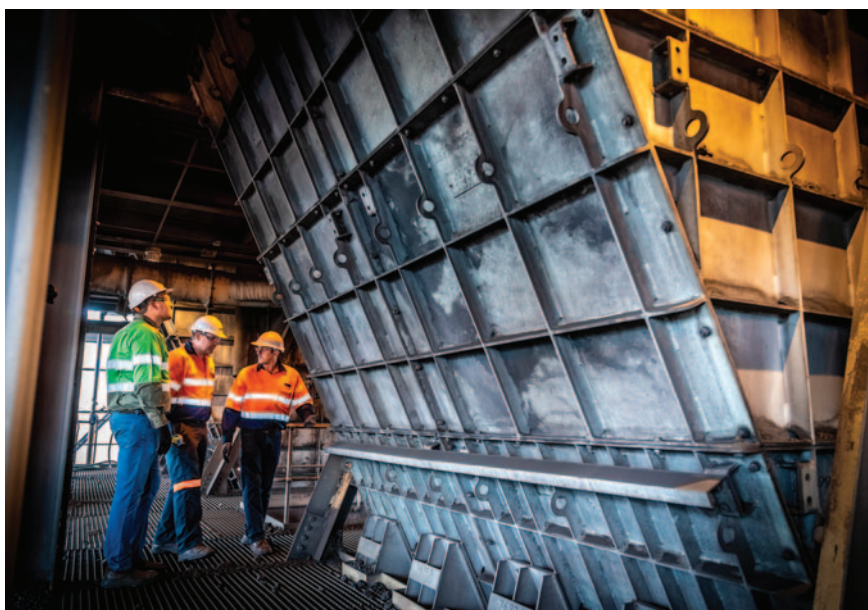
SUPPORTING A CIRCULAR ECONOMY

Beyond its product advantages, Weba Chute Systems also contributes to broader circular economy principles. The company supports refurbishment and upgrade strategies that allow customers to extend the lifecycle of their assets. Rather than disposing of aging chutes and installing entirely new systems, Weba Chute Systems offers site-specific retrofits and component replacements that breathe new life into existing infrastructure.

"These projects are an important part of our commitment to resource efficiency," adds Baller. "They allow us to reduce environmental impact while still delivering improved performance."

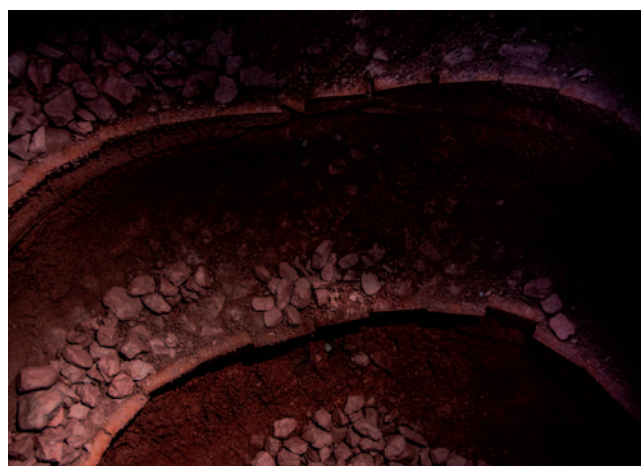
ENGINEERING EXPERTISE WITH GLOBAL IMPACT

With a footprint that spans over 5,000 installations worldwide, Weba Chute



Systems serves customers in mining, ports, power generation and materials handling facilities across five continents. The company's in-house design and engineering team uses advanced simulation tools to ensure each chute meets the specific environmental and operational conditions of its site, whether the goal is reduced dust, lower noise or improved flow control.

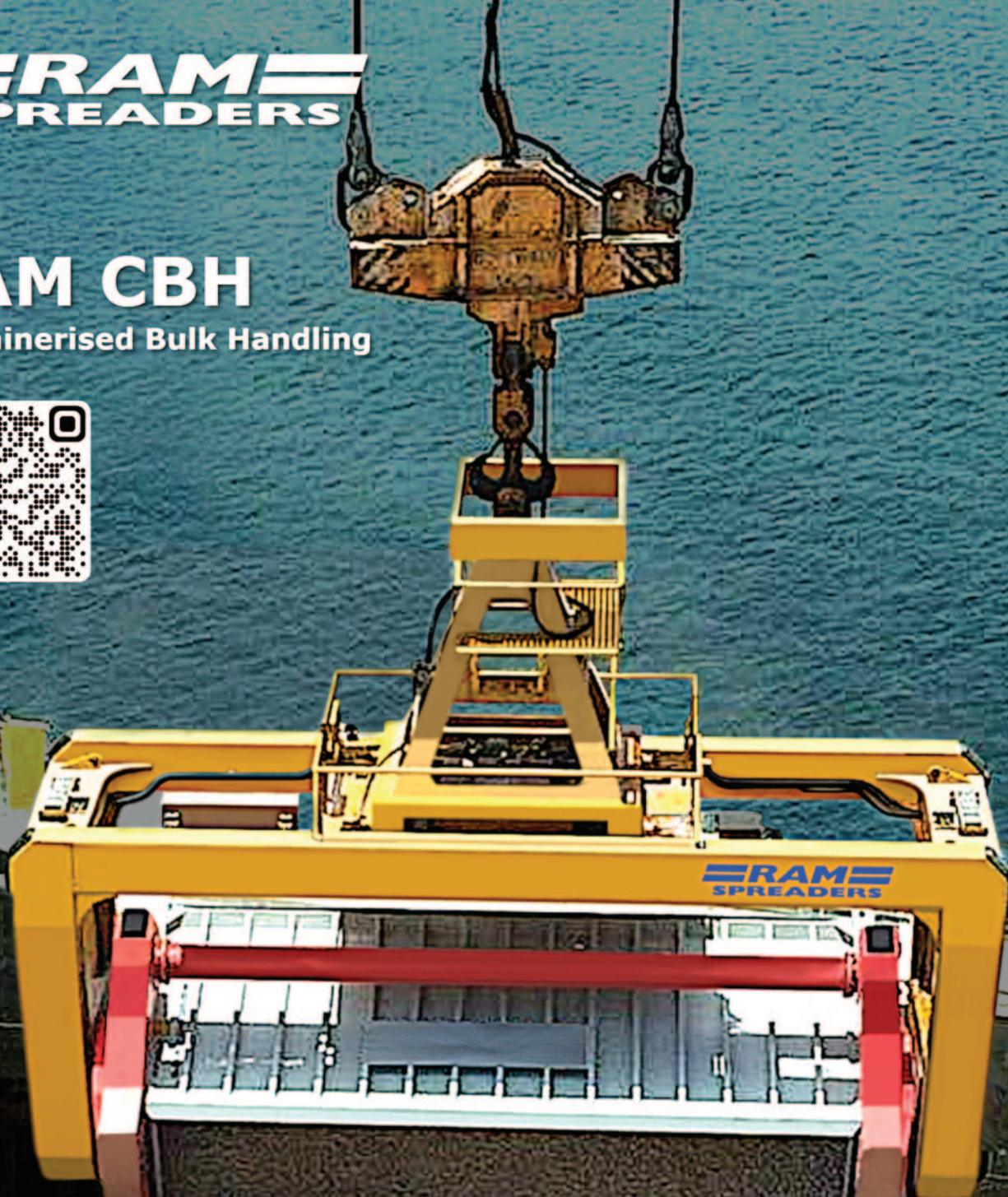
As the dry cargo industry embraces greener practices, engineered transfer point solutions like those from Weba Chute Systems are becoming essential. By integrating sustainability into the core of their designs, the company is not just improving operational outcomes — Weba Chute Systems is helping set a new standard for environmentally responsible bulk handling.



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Geometrica: innovating dome solutions for a global industry

For over 30 years, Geometrica has designed and delivered custom-engineered domes and space frames for industrial and architectural applications worldwide, writes *Priscilla Garza, Marketing Specialist, Geometrica.*

Our proprietary technology and innovative methods allow us to build long-span, column-free structures for sectors such as mining, cement, and energy. Headquartered in Houston, Texas, with additional offices in Monterrey, Mexico, and a global network of representatives, we've completed projects in over 40 countries across five continents.

DESIGNING FOR DURABILITY AND EFFICIENCY

Geometrica specializes in structures that protect and optimize bulk material storage, such as ores, coal, limestone, and copper. Our patented Freedom® technology allows for durable, weather-resistant domes that withstand extreme conditions, including heavy snow, high winds, tropical rains, and seismic activity. Free from internal columns, these domes maximize storage capacity while simplifying operations.

INNOVATIVE CONSTRUCTION METHODS

Geometrica's approach to construction is defined by efficiency and safety. The revolutionary Lifting Tower system allows domes to be assembled at ground level and safely lifted into place, significantly reducing construction time, labour costs, and, most importantly, risks. Capable of handling structures exceeding 500 tonnes, the Lifting Tower has become a cornerstone of our approach to safer, faster construction.

Additionally, the Hercules production line represents a breakthrough in manufacturing flexibility. This transportable facility enables the local fabrication of dome components near project sites, dramatically reducing freight costs and supporting local economies. By utilizing locally sourced materials and streamlining logistics, the Hercules line accelerates timelines and ensures cost-effective delivery for projects in remote or urban locations alike.

SUSTAINABILITY AT THE CORE

Geometrica is committed to helping



clients meet environmental standards while maintaining profitability. Our domes are designed to minimize dust emissions, prevent runoff, and optimize land use, supporting sustainable operations and reducing environmental impact. With minimal maintenance requirements and long-term reliability, our structures provide both ecological and economic benefits.

PROVEN RESULTS ACROSS INDUSTRIES

While our focus lies in bulk storage for mining and cement, Geometrica's solutions have been successfully applied across diverse industries, including energy plants

and architectural projects. Our adaptable designs thrive in challenging terrains and climates, making them the ideal choice for operations in remote or extreme environments.

COMMITMENT TO QUALITY

Geometrica is ISO 9001:2015 certified, with additional certifications for welding quality ISO 3834, and EN 1090 to mark its structures with the CE seal required to export to the European Union. These certifications reflect our commitment to delivering the highest-quality structures for every project.



Bruks Siwertell sets standard for enclosed, safe energy transitions



Although relatively simple in their construction and operation, bulk carriers and bulk cargoes are responsible for some of the most serious safety incidences in global shipping. Oxygen-depleting, self-igniting cargoes such as biomass and grain, and the transportation of highly volatile bulk materials, which literally crackle in the hold, such as sulphur, are just some notable examples. The majority of these safety risks stem from their enclosure, but they must be enclosed as they would spoil or pollute if in the open air. How then can we mitigate these risks and improve safety standards for the industry?

Bruks Siwertell offers large-scale, fully enclosed, ship unloading systems capable of overcoming these risks, and simultaneously protecting the environment from fugitive dust and spillage.

For sulphur, Bruks Siwertell developed the Siwertell Sulfur Safety System (4S). With the 4S in place, ship-unloaders are fitted with temperature sensors along the conveying line, enabling the system to respond immediately to sudden increases, shutting down the conveyor and saturating the cargo with water at transfer points.

This prevents any ignited cargo to propagate a fire within downstream equipment and storage silos. Unloaders are also designed with explosion venting and suppression systems, meaning that in this unlikely event, hot gases are vented safely away from ship and quay, and personnel.

RAISING AWARENESS

While the threat of spontaneous combustion is well understood throughout bulk supply chains such as grain and sulphur, biomass pellets are still in a growth phase, and not everyone is aware of the risks. Many years of proven success with the 4S enables Bruks Siwertell to also set the safety standard for energy transitions from coal to biomass.

Like sulphur handling Siwertell ship-unloaders, Siwertell biomass handling systems have a unique safety system that prevents and mitigates fire risks, detects hot spots, and manages explosion risks. The recognition of the critical importance of this system, and its current and future role, is more urgent now than ever before.

One of the most significant challenges

of our time is that of climate change, and how to navigate the world's insatiable appetite for energy at the same time as moving away from fossil fuels.

As an industry, we have to enable safe energy transitions. The transfer of this cargo must also meet the highest efficiencies possible, as the volumes of biomass required to replace the calorific value of coal are much greater; around treble the quantity.

DUST IS NO ONE'S FRIEND

Biomass pellets, although dense and consistent are also fragile, their integrity has to be maintained to minimize material degradation and dust. Dust is no one's friend, it pollutes the environment, heightens fire risk, and also impacts combustion efficiency.

These are all areas overcome with Siwertell ship unloaders fitted with unique safety systems. For example, once the UK's largest coal-fired power station, Yorkshire's Drax has now switched entirely to biomass-burning as of last year, becoming Europe's biggest importer, and the UK's single-largest generator of renewable electricity. How, then, does Drax ensure safe fuel supplies?

Drax's wood pellets are unloaded at a number of UK locations including at Associated British Ports' Immingham Renewable Fuels Terminal (IRFT), which has been served by two rail-mounted ST 790-D Siwertell ship unloaders since 2014. In 2016, the Ligna Biomass terminal in Liverpool, UK, came online. Operated by Peel Ports, it is also equipped with two ST 790-D high-capacity unloaders. They supply Drax with up to ten train loads of pellets per day and account for up to 40% of the total biomass consumed by Drax each year.

THE URGENCY OF NOW

Drax's transition to biomass pellets is just one of several power-generators that Bruks Siwertell is assisting with a uniquely conscientious approach to safety, longevity, and environmental stewardship, while never sacrificing the high throughput for which its systems are known for.

Bruks Siwertell invites the judging panel to consider how the safety systems integrated into its unloaders are addressing the critical safety challenges associated with biomass pellet handling, enabling a safer and smoother transition to a circular energy economy, whilst also extending this safety record to other materials.

ADS™ Dry Fog start-up at UNACEM's Truck Dump Ecuador – January 2025

In January 2025, we successfully completed the startup of a state-of-the-art ADS™ Dry Fog dust suppression system at the truck dump area of an UNACEM limestone mining operation in Ecuador, writes *Gonzalo Campos Canessa, CEO, The Raring Corp.*

This project marks a significant achievement for our team and for UNACEM, as it addressed one of the most challenging dust-generating points in the entire operation — where heavy haul trucks unload massive quantities of limestone into the primary feed system. Also, this is the very first project for TRC, during our 40 years of history, in Ecuador.

BACKGROUND AND CHALLENGES

During the engineering phase, the primary crusher building was identified as a critical dust source. Every time a loaded truck discharged its load, large clouds of fine limestone dust would be released into the air. These dust clouds posed multiple problems: they endangered the health and safety of the workers, reduced visibility and operational efficiency, contributed to accelerated wear on equipment, risked polluting the air, and non-compliance with environmental regulations.

Standard dust control measures, such as water sprays, had been used by competitors and by other end-users, but proved insufficient. Excess water created slippery conditions, risked material stickiness, and led to drainage and runoff management issues. The mine's management sought a more effective and sustainable solution — one that would suppress airborne dust without the negative side effects associated with traditional methods.

PLANNING AND SYSTEM DESIGN

Our involvement began in 2022 with a detailed proposal and preliminary design for controlling dust at the primary crushing building. We studied the truck dump's layout, truck traffic patterns, limestone



material properties, airflow dynamics, and the operational demands of the site. Based on this analysis, we custom-designed a ADS™ Dry Fog dust suppression system tailored specifically for the truck dump environment.

The system would use specialized nozzles to generate extremely fine water droplets — under 30 microns — creating a blanket of fog in the immediate area of dust generation. These micro-droplets agglomerate with airborne dust particles, causing them to fall out of suspension before they could spread. This same technology was used on the apron feeder and its transfer to the sacrifice belt.

PREPARATION FOR STARTUP

All equipment, including the individually mounted fog nozzles, water and air lines, filtration systems, compressors, and control panels, was delivered to the site during 2024. Our technical team worked closely with the mine's maintenance staff to integrate the system into existing structures at the truck dump.

By early January 2025, the installation was complete, and all components had been tested individually in preparation for full system startup.

THE STARTUP PROCESS

On January, 2025, after thorough pre-startup checks, we initiated the first full operation of the ADS™ Dry Fog system at

the truck dump. The start-up process was carefully staged:

- ❖ First, we tested the compressed air delivery system to ensure stable pressure and flow.
- ❖ Then, we verified water filtration and pressurization.
- ❖ Once conditions were optimal, we activated the ADS™ Dry Fog nozzles in small sections, gradually covering the full dump pocket area.

Real-time adjustments were made to optimize the nozzle spray patterns, coverage areas, and fog density to ensure the most effective dust capture without over-saturating the environment.

The results were immediate and impressive. Where previously every truck dump produced a visible, lingering dust cloud, the new system significantly suppressed dust at the source. The fine water droplets effectively captured the majority of airborne dust particles before they could escape into the surrounding area.

IMPACT AND BENEFITS

Workers reported dramatically improved visibility, and there were no longer complaints about breathing issues or dusty working conditions.

Operational efficiency also benefited. Equipment such as feeders, crushers, and conveyors downstream of the truck dump stayed noticeably cleaner, reducing maintenance needs and minimizing unscheduled downtime caused by dust-related equipment failures.

Another major advantage was water conservation. Unlike traditional wet suppression systems that use large volumes of water, our ADS™ Dry Fog system uses a fraction of that amount — only enough to create micro-droplets — thereby avoiding the issues of runoff, mud, and erosion at the dump area.

The ADS™ Dry Fog system's integration





with the site's automated controls also allowed for smart operation: fogging could be triggered automatically when a truck approached or dumped, and when conveyor is running and loaded, minimizing unnecessary operation and optimizing resource use.

An unexpected result of installing and commissioning our Dry Fog system within this plant was that it effectively suppressed sulfur odors noticed before turning on our equipment. We were not aware that the material being processed was high in

Sulphur content, but Fog microdroplets neutralized odour-causing sulphur compounds through chemical reactions or encapsulation, breaking them down at a molecular level. This method provides thorough and even distribution, ensuring efficient suppression of persistent and unpleasant sulphur odours.

TRAINING AND HANDOVER

To ensure the long-term success of the system, we provided comprehensive training to the mine's operations and

maintenance teams. Training sessions covered system operation, basic troubleshooting, maintenance practices, and periodic inspection routines. We also supplied detailed documentation including manuals, schematics, and maintenance schedules customized for the site.

Our goal was to empower the client's team with full ownership of the system, ensuring that it remains effective for many years to come.

CONCLUSION

The successful startup of our ADS™ Dry Fog dust suppression system at the truck dump area of this limestone mine in Ecuador stands as a strong example of how technology, engineering, and teamwork can solve critical operational challenges. We are proud to have delivered a solution that improves worker safety, enhances operational efficiency, and supports environmental stewardship.

We look forward to building on this success and continuing to support the mine with future dust control initiatives across other parts of their operation.

Arden Equipment clamshells: excellence in port handling operations



CUTTING-EDGE TECHNOLOGY FOR DEMANDING PORT ENVIRONMENTS

In the highly specialized sector of port handling, Arden Equipment stands out as a key player with its range of high-performance clamshells. Designed for durability, precision, and reliability, these clamshells are perfectly suited for intensive loading and unloading operations in river and sea ports — whether on barges, wagons, or vessels.

The BA and BH models are compatible with excavators from 5 to 80 tonnes and beyond. They deliver optimal performance for handling bulk materials such as gravel, coal, minerals, grain, sand, and more.

Recent images captured in action

showcase Arden Equipment clamshells in diverse port environments: one mounted on a river barge handling aggregate (the BH model with horizontal cylinders), and another actively moving coal in an industrial port setting (the BA model with vertical cylinders).

These examples highlight the versatility and operational efficiency of Arden Equipment clamshells, which are built to meet the logistical demands of any worksite.

ROBUST AND CUSTOM-BUILT DESIGN

Arden Equipment clamshells are built with high-yield-strength and abrasion-resistant materials, ensuring durability even under



extreme working conditions. Key wear parts are made of 450HB steel, providing optimal resistance to abrasion.

Equipped with 360° rotation, driven by one or two motors, these clamshells offer excellent flexibility.

Several models — from the BA303 to the BA553 — can be fitted with interchangeable shells, allowing adaptation to the type of material being handled. This modularity improves cost-effectiveness on the job site.

Arden also offers tailor-made solutions to meet the specific requirements of each port, including reinforced models with double or quadruple vertical cylinders, such as the BA 614, 714, and 814.

TMSA solutions for bulk solids handling combined with efficient control

TMSA combines its extensive experience of over five decades with innovation to deliver comprehensive solutions for bulk solids handling, offering high performance, a strong focus on sustainability, and a firm commitment to operational safety, writes *Alex Lima de Moraes, Commercial Coordinator, Environmental Control and Industrial Dust Removal, TMSA and Fladimir de Souza Barbosa, Commercial Manager, Customized Solutions Unit for Port Terminals, TMSA.*

One of its main differentiating factors is the development of systems that combine robustness, efficiency, and effective control of particulate emissions into the environment.

With special attention and ongoing concern for the environment, sustainability is a cross-cutting theme in the company's discussions, projects, and strategic decisions. TMSA has established a set of standards, best practices, and solutions guided by ESG principles (Environmental, Social, and Governance), promoting socio-environmental awareness and minimizing the impact of its operations.

The company actively monitors its activities and adopts concrete measures in favour of environmental preservation. It uses only electricity from clean and 100% renewable sources and works with a network of suppliers and partners who share the same commitment to sustainability, focusing on generating positive impact both in the market and in the communities in which it operates.



1. TMSA SHIPLOADER WITH ENCLOSED BELT CONVEYOR, SPOT FILTERS, AND DSH DUST SUPPRESSOR

This commitment is reflected in technological solutions applied to ship loading operations at port terminals, where TMSA offers an integrated system composed of a mobile shiploader, enclosed belt conveyor, spot filters, and the DSH dust suppressor. This combination ensures a safe, clean, and efficient operation with excellent cost-effectiveness.

TMSA has a pioneering history in Brazil: it was responsible for building the country's first port system for loading soybeans, back in 1972. Since then, it has established itself as a benchmark in the supply of fixed or mobile shiploaders, which stand out for their wide range of motion and high productivity — reaching all areas of a vessel's hold or barge without requiring repositioning of the vessel during loading. The company supplies equipment for solid bulk terminals handling materials such as grains, sugar, iron ore, and various minerals. Currently, approximately 70% of the grains exported through Brazilian ports are handled using TMSA solutions.



The company's expertise in enclosed belt conveyors extends to various applications: the conventional model, the multi-product model, and the air-supported return model. All of them are designed with a focus on emission containment, loss reduction, and ease of maintenance and operation. The modular construction of these conveyors also enables fast assembly, seamless integration into the customer's layout, and simplified implementation of fire suppression systems. Additionally, TMSA's spot filters are installed directly at emission sources, eliminating the need for complex ductwork, minimizing process losses, and maintaining operational efficiency.



The DSH dust suppression system, installed at the discharge spout outlet, ensures emission control without the need for aspiration systems. It concentrates the material flow into a compact column, reduces fine particle dispersion, and contributes to a cleaner environment.

of particulate emissions into the environment

without compromising productivity. The system features a relief mechanism that automatically opens in the event of blockage, allowing full product flow and preventing equipment overload.

With durable, low-maintenance, and highly reliable solutions, TMSA delivers socio-environmental value by minimizing the generation of waste, contaminants, and airborne dust. Its portfolio is designed to address the challenges posed by the growing grain production and the increasing demand for greater logistical efficiency — ensuring sustainability and performance at every stage of the supply chain.

In doing so, TMSA reaffirms its leadership in developing solutions that transform bulk solids handling into an increasingly clean, safe, and sustainable activity.

With the continuous growth in grain production, it becomes essential for storage facilities and export units to adopt strategies that enhance performance, reduce losses, and ensure profitability. In this context, TMSA stands out as the ideal partner, offering high-capacity equipment, long-distance conveying solutions, superior energy efficiency, and outstanding reliability — specifically engineered for port terminals.

2. MOBILE AND REVERSIBLE ENCLOSED BELT CONVEYOR WITH DSH DUST SUPPRESSOR

TMSA offers complete and customized solutions for bulk solids handling, with mobile and reversible belt conveyors standing out in our portfolio for their versatility, reliability, and efficiency across a wide range of industrial applications.

Engineered to support dynamic operations — such as shiploading and

unloading, silo feeding, truck and railcar transfer, or stockpile formation — these conveyors easily adapt to various plant layouts and the specific operational needs of our clients.

Its mobile structure allows for quick and safe repositioning, optimizing logistical flows while reducing operational costs and minimizing the need for auxiliary equipment such as loaders.

The reversible system enables the inversion of material flow on the same belt, providing greater flexibility to feed multiple points from a single conveying line, with high reliability and precise control.

With customized capacities, robust construction, and the option for full or partial enclosure, TMSA's mobile and reversible conveyors can be integrated into environmental control systems — such as bag filters and dust suppressors — contributing to the reduction of fugitive emissions and ensuring compliance with the strictest regulatory standards.

By choosing TMSA, clients benefit from a highly specialized technical team, decades of experience in bulk solids handling solutions, and an ongoing commitment to innovation, sustainability, and superior operational performance.



With the continuous growth of grain production and the increasing regulatory demands regarding the safety of facilities — and especially of people — TMSA has been developing and implementing complementary solutions that enhance the efficiency and operational safety of installed systems. Among these solutions, the integration of mobile and reversible belt conveyors, DSH-type dust suppressors, and the grain storage warehouse dust extraction and depressurization system stands out.

This system is designed to significantly reduce the concentration of combustible dust suspended inside storage facilities, acting preventively against explosion and fire hazards. Through a set of technical and structural measures, the system also contributes to the creation of a slightly negative internal pressure environment, preventing particulate matter from dispersing into the external environment.

Additionally, it prevents the entry of birds, promoting more sanitary conditions and protecting the integrity of the stored grain.

This is an intelligent and effective solution that can be combined with other technologies to fully meet the requirements of environmental agencies, fire departments, insurance companies, and other regulatory entities — adding value to operations, asset protection, and the institutional image of all clients.



Sustainable logistics solutions by Polimak

In logistics and warehouse management of dry bulk materials, the bulk transport process generally includes three main stages: loading — the transfer of bulk solids from storage or production sites into transport vehicles; main carriage — the transport of the product using various modes such as trains, container ships, or standard container chassis; and finally unloading — the discharge of materials at the destination facility for further processing, storage, or distribution. Managing this process is challenging not only in terms of maintaining operational safety and regulatory compliance, but also in ensuring economic efficiency and environmental responsibility.

Polimak's Smart Logistics Systems provide a sustainable and efficient approach to transporting bulk solids, engineered to overcome the challenges outlined above. Its containerized transportation solutions offer distinct advantages over conventional logistics methods, such as open trucks, bulk carriers, or FIBC bags, in reducing environmental risks. In comparison to those traditional methods, Polimak's containerized transport systems offer environmental, operational, and economic advantages for bulk solids handling.

The company's containerized transport systems simplify the handling of various bulk solids by eliminating the need for tilting equipment during product discharge. From low-density materials like fly ash and wheat flour to hard-to-flow products like cement and calcium carbonate, its mechanical, horizontal system ensures safe and controlled handling of bulk solids using ISO (International Organization for Standardization) containers of all sizes. This solution removes the need for risky and complex tilting systems altogether, reduces infrastructure costs, and enables efficient, automated dosing. Compared to traditional equipment such as FIBC bags, open trucks, and bulk carriers, it offers greater safety, efficiency, and environmental control. Polimak's containerized approach effectively overcomes these challenges, offering the following key benefits:

1. OPERATIONAL FLEXIBILITY

- ❖ **Multimodal compatibility:** Polimak's containerized systems can seamlessly operate across different transport modes, including trucks, trains, and ships, without requiring any modifications. This flexibility allows for streamlined logistics planning and



reduced transfer delays between transport types.

- ❖ **Quick setup anywhere:** the modular, portable design allows setup to be done quickly with minimal need for permanent infrastructure. This makes the system ideal for both remote sites and urban settings where space and construction capabilities may be limited.
- ❖ **Easy retrofits:** Polimak's systems can be integrated into existing logistics chains without major overhauls. This enables companies to modernize their operations without costly downtime or infrastructure replacement.

2. PAYLOAD EFFICIENCY

- ❖ **Higher net payloads:** with efficient use of container space and optimized liner systems, Polimak's solutions allow for maximum product volume or weight per load. This means fewer shipments are needed to move the same amount of material, lowering transport costs.
- ❖ **Reduced dead weight:** the design uses lighter materials and eliminates the need for extra handling hardware, which reduces the overall weight of the transport unit. This not only reduces shipping expenses but also contributes to lower fuel consumption and emissions.

3. ENVIRONMENTAL BENEFITS

- ❖ **Reduced emissions:** by minimizing

intermediate handling stages and reducing reliance on energy-intensive equipment like pneumatic trucks, Polimak's systems help lower the carbon footprint of bulk transport operations.

- ❖ **Reusability/recyclability:** Polimak's containers are designed for multiple uses, and many components are recyclable, reducing environmental waste. This makes its solution more attractive to companies with sustainability goals or ESG commitments.

4. CUSTOMIZATION & SUPPORT

- ❖ **Tailored liners/discharge systems:** each system can be customized based on the specific bulk material being transported, such as powders, granules, or abrasive and corrosive products. This ensures safe, efficient handling for a wide range of materials.
- ❖ **Training, tech support, spare parts:** Polimak provides comprehensive after-sales service, including staff training, technical support, and a reliable supply of spare parts. This helps ensure long-term reliability and customer satisfaction beyond the initial installation.

5. TOTAL COST OF OWNERSHIP (TCO)

- ❖ **Fewer labour hours:** the simplified operation of the system means fewer manual handling tasks, resulting in lower labour costs over time.

Processes like loading and unloading are faster and require minimal intervention.

- ❖ **Lower downtime:** The company's mechanical system design is straightforward and durable, leading to fewer breakdowns and reduced maintenance needs. This helps maintain productivity and keeps logistics flowing smoothly.
- ❖ **No specialized operators:** The user-friendly nature of our equipment means there's no need for highly skilled or specialized operators. This

makes workforce training easier and reduces operational dependency on specific staff.

With more than four decades of expertise in bulk material handling and a commitment to innovation, Polimak continues to modernize bulk logistics through sustainable and efficient solutions. Its Smart Logistics Systems are specifically designed to optimize every stage of the bulk transport process, from loading and main carriage to unloading, while ensuring environmental safety, regulatory

compliance, and cost-effectiveness. By minimizing dust emissions, reducing material loss, and enhancing operational processes, the company's containerized transport solutions not only overcome the limitations of conventional methods, but also raise the standard for safe, clean, and reliable logistics. Scalable, modular, and easily integrated into existing infrastructure, Polimak's systems enable industries worldwide to transport bulk materials with efficiency and environmental responsibility.

Driving sustainability in bulk cargo handling

How MCS IS SETTING NEW ENVIRONMENTAL STANDARDS

Bulk cargo handling plays a vital role in global trade, facilitating the critical transport of essential materials across various the globe for various industries. At the heart of this process are environmental controls that play a critical role in maintaining supply chains at ports.

Mobile Conveying Services Pty Ltd (MCS) has revolutionized bulk cargo logistics by designing patented specialized bulk cargo loading systems that enhance safety, environmental controls, efficiency, and reliability.

Established in Brisbane in 2007, MCS is a private Australian company supplying specialized equipment, skilled labour, and expert management to customers across Australia and the Pacific region.

MCS ENVIRONMENTAL FOCUSED DUST CONTROL LOADING SYSTEM

On top of the significant features of the MCS Bulk Loading System, and with the global spotlight on environmental controls, the operation delivers major improvements in managing dusty cargoes — substantially reducing airborne particles and preventing dispersion into nearby communities. This commitment to high-quality, environmentally focused equipment enables MCS to provide innovative solutions that enhance environmental protection, operational efficiency, and safety.

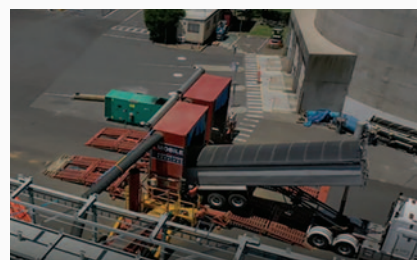
As global trade continues to evolve, so too does the demand for sustainable, forward-thinking cargo handling technologies. MCS remains at the forefront of this evolution, delivering bulk loading systems designed to meet the growing need for environmental sustainability, safety, and streamlined supply chain operations.

In this case, MCS successfully met the stringent environmental regulations set by both DAFF and the Port Company, ensuring the customer's cargo was loaded safely and in full compliance with all standards. This was achieved through close collaboration with regulatory authorities and the customer, the integration of effective dust suppression systems, and strict adherence to operational protocols — all focused on minimizing environmental impact while maintaining high levels of efficiency and product integrity.

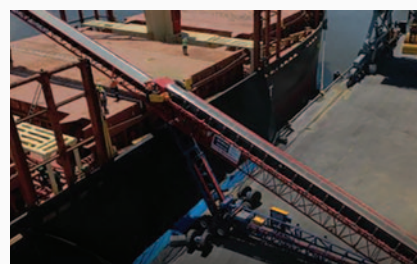
Looking ahead, MCS continues to invest in innovation and sustainable design, ensuring its bulk loading systems not only meet today's regulatory and operational demands but are also prepared for the evolving expectations of tomorrow. By aligning technological advancement with environmental responsibility, MCS is helping shape a cleaner, safer future for bulk cargo handling — one where efficiency and environmental care go hand in hand.



Full loading system — dual bay truck unloader with enclosed rear doors feeding a fully enclosed Telestacker conveyor into vessel.



Truck tipping into Dual Bay Truck Unloader with enclosed rear doors and dust extraction system for enhanced environmental control.



Fully enclosed Telestacker loading dusty cargo into vessel via chute with hatch cover closed.



Left: The complete RMS Light system housed in a portable box. Right: A DJI Mavic 3 Enterprise equipped with the TINAMU sensor. The system is manually operated, and the generated point clouds can be uploaded directly for analysis and digital twin generation.

Tech in bulk

Software & Automation

Jay Venter

TINAMU launches RMS Light: A cost-efficient LIDAR-based solution for bulk inventory monitoring

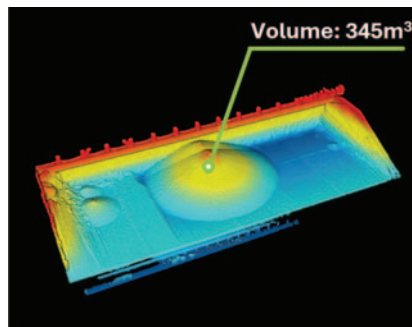
Swiss drone technology firm TINAMU Labs has introduced RMS Light, a compact and mobile solution for stockpile measurement and dry bulk inventory control. Building on the success of its fixed-installation Robotic Monitoring System (RMS), TINAMU now offers a more flexible and accessible alternative for operators seeking accurate volumetric data without the cost and complexity of permanent infrastructure.

At the heart of RMS Light is a LIDAR sensor module developed in-house by TINAMU, designed to integrate with commercial drones such as the DJI Mavic 3 Enterprise or selected Parrot models. The system can be flown manually, allowing rapid deployment across diverse operational settings, including ports, rail terminals, and inland storage yards. In restricted airspace, the sensor can also be operated without the drone in a handheld version.

Unlike conventional survey-grade LIDAR systems that generate unstructured point clouds requiring extensive post-processing, RMS Light offers a streamlined workflow. Users can upload data directly to TINAMU's secure cloud portal, where a digital twin is automatically created. This digital twin transforms raw 3D scan data into a structured, interactive model of the site, enabling measurement, monitoring, and historical comparison over time.

FROM POINT CLOUD TO DECISION ENGINE

A point cloud captures geometry. A digital twin interprets it. This shift from passive

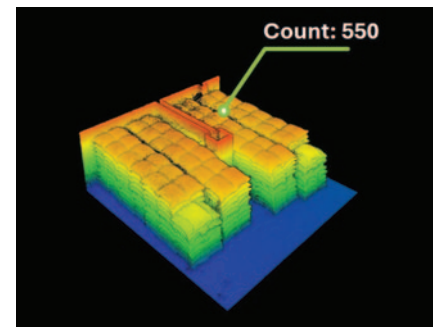


Left: Point clouds can be uploaded directly, automatically segmented, and used to estimate volume and density. Right: Advanced analytics enable automated inventory counting and anomaly detection.

data to actionable intelligence is what differentiates RMS Light. Once uploaded, scan data is automatically segmented to isolate stockpiles from infrastructure. When combined with operator-supplied weight data, the system estimates material density over time — frequently with greater accuracy than traditional bulk density methods. This leads to more precise inventory valuations and supports better-informed operational decisions.

Designed with operational efficiency in mind, RMS Light reduces both the technological barrier and the operational footprint. Traditional inventory surveys often require heavy-lift drones, trained pilots, and custom software pipelines. In contrast, RMS Light leverages lightweight off-the-shelf drone hardware, intuitive workflows, and browser-based tools, making it accessible to in-house teams and third-party service providers alike.

In addition to volume measurement, TINAMU's platform supports advanced analytics such as box counting, change



detection, and trend analysis — essential in any multi-material yards where space utilization and segregation are critical. These empower users to advance from simple volumetric data to a robust and comprehensive digital inventory strategy.

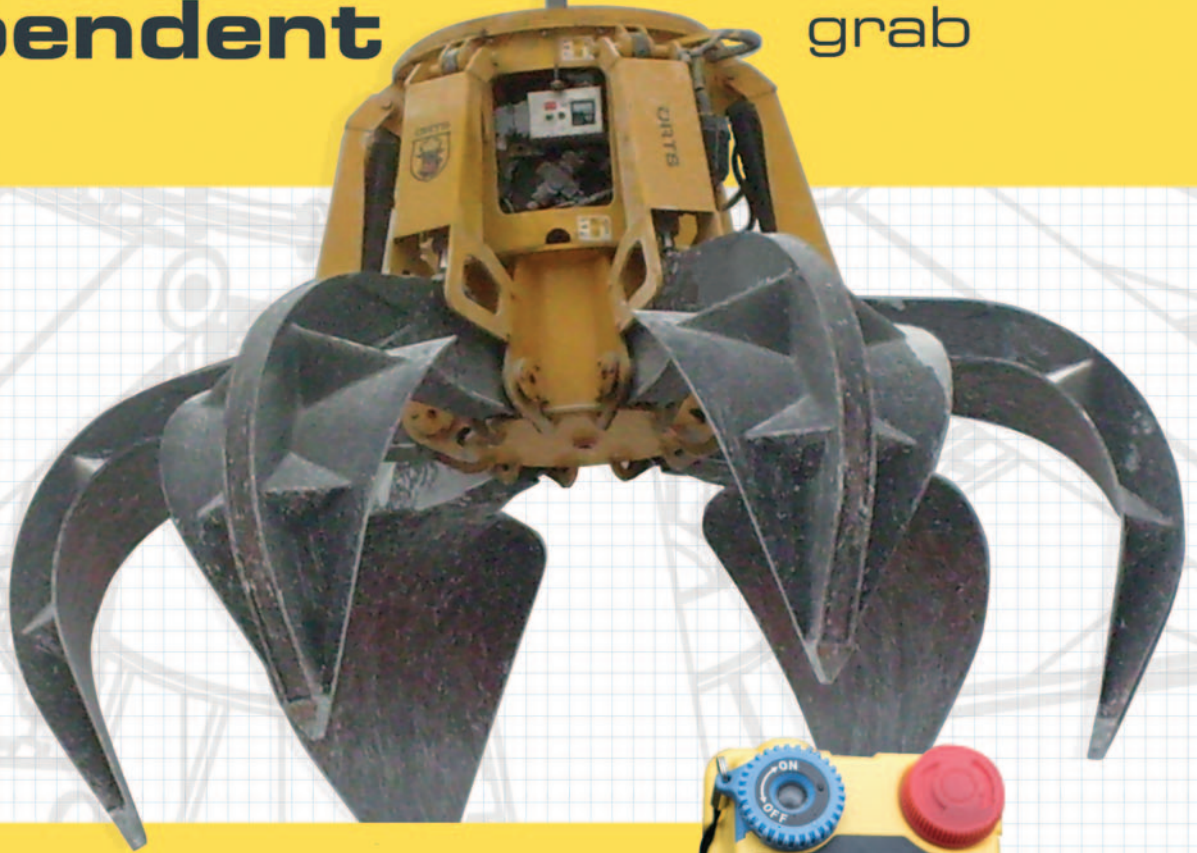
A SCALABLE TOOL FOR MODERN BULK OPERATIONS

For asset managers and logistics operators across the dry bulk sector, RMS Light offers a path to digitization that is both pragmatic and cost-effective. Whether used for ad-hoc inspections, periodic cycle counts, or integrated into ongoing monitoring routines, RMS Light helps teams reduce manual surveying, enhance accuracy, and make data-driven decisions — all without significant capital expenditure or infrastructure investment.

By bridging the gap between high-resolution spatial capture and user-friendly analytics, TINAMU's RMS Light represents a practical evolution in drone-based monitoring and stockpile intelligence.

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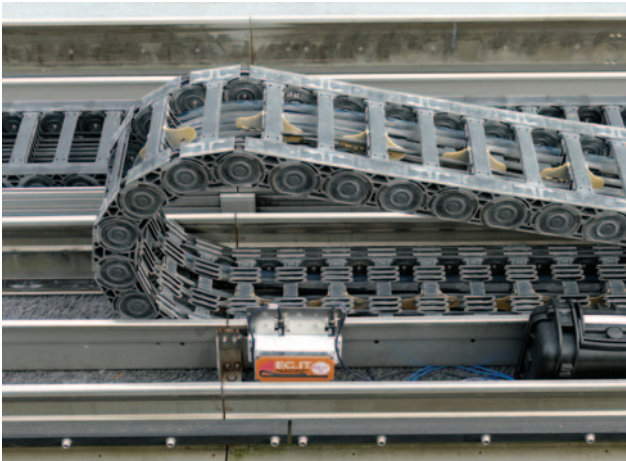
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Leveraging igus Smart Plastics for cutting-edge efficiency in dry bulk commodity handling



igus's Smart Plastics, specifically designed for rugged environments, are proving indispensable in the dry bulk commodity sector.

Efficient handling of dry bulk commodities — such as coal, powders, and granules — requires equipment that can withstand tough operational conditions while ensuring maximum reliability and minimal downtime. These industries often deal with abrasive materials, dust-laden or corrosive environments, and heavy machinery that demand durable and intelligent systems. As technology evolves, igus has emerged as a leader in developing innovative solutions for these challenges. Known for its high-performance polymer products, igus has combined advanced materials with intelligent sensor technology to revolutionize equipment longevity, predictive maintenance, and operational efficiency.

igus's Smart Plastics, specifically designed for rugged environments, are proving indispensable in the dry bulk commodity sector. Whether paired with advanced sensor systems or incorporated

into platforms like Superwise for predictive maintenance, igus products are redefining the benchmarks for efficiency, safety, and sustainability in the industry.

SMART PLASTICS: PERFORMANCE BUILT FOR HARSH ENVIRONMENTS

igus products are built from proprietary high-performance polymers that are resistant to wear, corrosion, and chemical exposure — all essential attributes for equipment handling dry bulk commodities. These materials are lubrication free, thus eliminating the need for external grease and oil, which can mix with dust in the operational environment to cause damage and inefficiencies. This makes igus components ideal for use in systems such as conveyors, elevators, hoppers, and silos, where the abrasive and dusty nature of bulk materials presents significant challenges to traditional metal components.

Highlighted product ranges include energy chains, plain bearings, and linear guides, all key components in bulk handling systems. The polymers used in igus products not only withstand high levels of wear and tear but also dramatically extend the lifespan of machinery. For instance, energy chains, which protect cables and hoses in conveyor systems, ensure smooth operations even under heavy loads and continuous movement.

What sets igus apart is the integration of sensor technology directly into these durable components, creating smart systems that actively monitor wear, performance, and environmental conditions. These capabilities transform what were previously static parts into dynamic contributors to modern industrial efficiency.

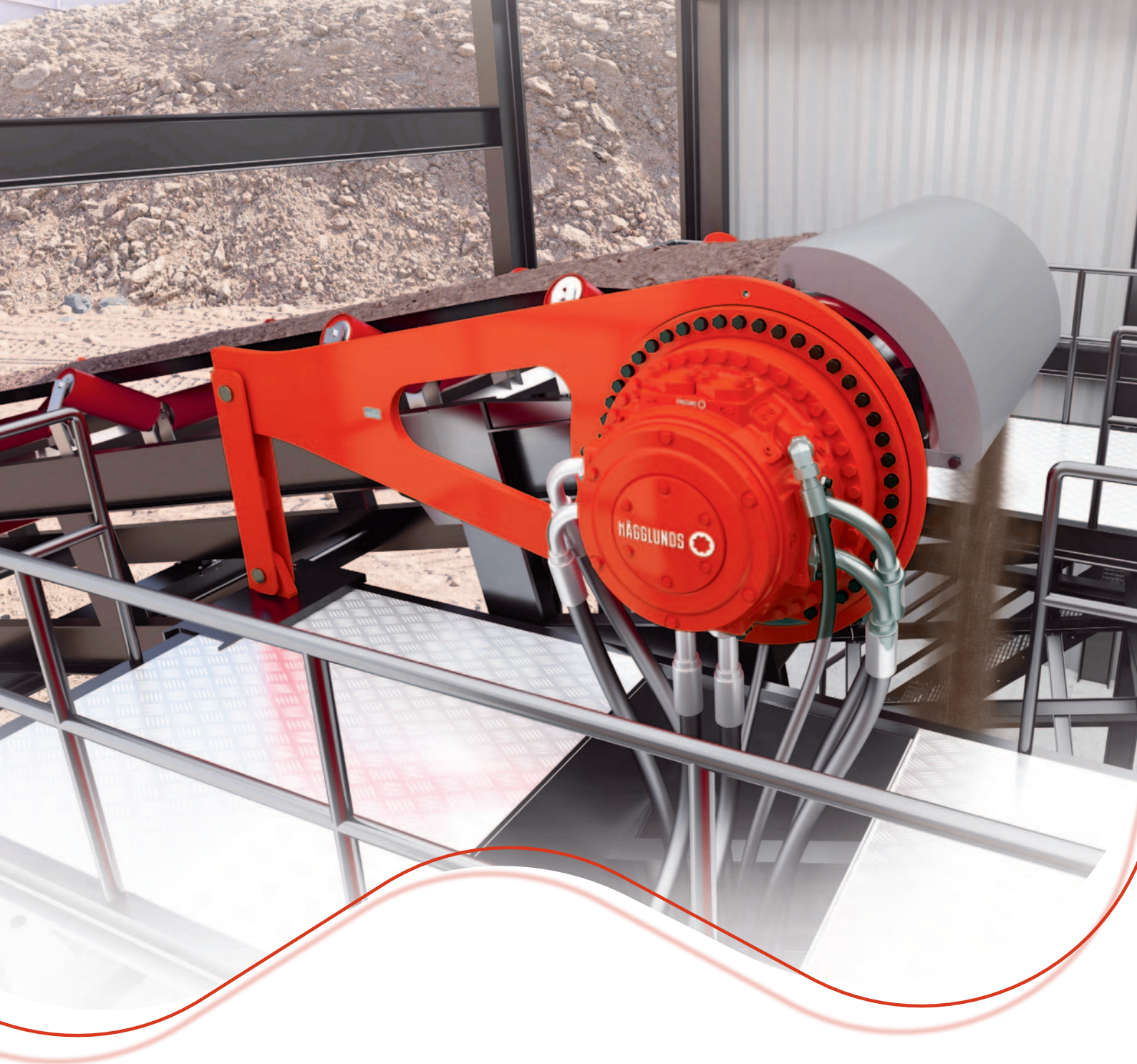
INTEGRATED SENSOR TECHNOLOGY: INTELLIGENCE AT WORK

Handling dry bulk commodities requires systems that perform flawlessly under demanding conditions — not just to avoid costly downtime, but also to maintain safety in environments where heavy-duty machinery operates alongside abrasive or flammable materials. Sensor technology embedded in igus Smart Plastics bridges the gap between efficiency and reliability by providing real-time data on wear, load, temperature, and environmental factors.

Key features of igus sensor-enabled components include wear monitoring and load and stress measurement.

igus sensors continuously measure the condition of critical components like bearings, energy chains, and cables. Operators are alerted when wear starts approaching critical thresholds, allowing maintenance to be scheduled proactively



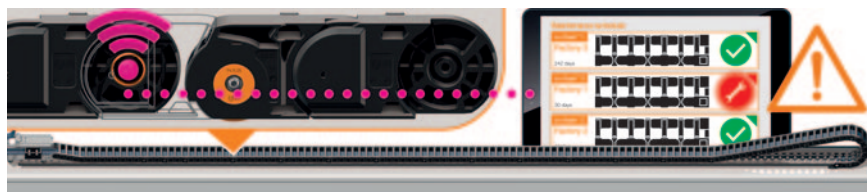


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igus' Superwise provides a centralized cloud-based platform that aggregates sensor data from equipment across entire facilities.

instead of reactively. This prevents sudden breakdowns, which can be disastrous in dry bulk systems like milling plants or grain silos.

Some high-capacity equipment, such as conveyors or silo loaders, operates under immense loads. Sensors monitor strain levels to ensure components are not exceeding safe operating limits. This protects machinery from unnecessary stress and reduces the likelihood of severe damage.

These sensors enable operators and maintenance teams to gather actionable data that can be analysed for insights. Recognizing issues before they occur transforms maintenance strategies, cutting downtime while maximizing productivity.

PREDICTIVE MAINTENANCE WITH SUPERWISE INTEGRATION

An industry-leading solution to predictive monitoring, Superwise provides a centralized cloud-based platform that aggregates sensor data from equipment across entire facilities. For dry bulk commodity operations, Superwise is a game-changer. When paired with igus's sensor-equipped Smart Plastics, it provides

unparalleled visibility into system health, allowing managers and technicians to make informed decisions about maintenance, upgrades, and operational optimization.

Superwise's intelligent algorithms analyse incoming sensor data and alert operators when there's an imminent issue. This assessment is based on data from igus' own test laboratory. On over 5,000 square metres, igus tests its products in realistic scenarios and thus collects reliable data.

Over time, Superwise learns from the operational patterns of machinery, using test and historical data to anticipate future maintenance requirements. This means that operators won't just fix problems as they arise — they'll be able to pre-empt them entirely. It also provides invaluable insights into trends, such as regions of a facility experiencing higher rates of wear.

Furthermore, industries tied to the handling of bulk commodities, operations often span large areas or are located in hard-to-access regions. Superwise allows operators to monitor systems remotely, saving time, reducing labour costs, and minimizing travel requirements for maintenance teams.

The combination of igus Smart Plastics and the Superwise platform ensures dry bulk commodity operations remain uninterrupted, highly efficient, and safer for workers while reducing overall operational costs. In particular, the ever-increasing automation of handling processes can be optimally supported, as monitoring by a human operator is no longer required.

igus Smart Plastics, combined with advanced sensor technology and the predictive maintenance capabilities of platforms like Superwise, represent a transformative approach to dry bulk commodity handling. These solutions provide industries with a clearer understanding of their systems, allowing for proactive interventions, cost savings, and sustainable operations.

With industries increasingly demanding intelligent and dependable solutions, igus continues to lead the charge, offering specialized, tech-driven products that ensure uninterrupted operations in even the harshest environments. For businesses handling dry bulk commodities, integrating igus innovations is not just an upgrade — it's a strategic advantage for long-term success.

AI not intelligent enough to diagnose engine problems – yet!

Condition Monitoring Technologies (CMT) has cautioned against placing sole reliance on artificial intelligence in ship condition monitoring, warning that human expertise remains essential to ensure safety and accuracy in maritime operations.

As the shipping industry rapidly adopts Artificial Intelligence (AI)-driven systems for machinery testing and diagnostics, CMT acknowledges the growing potential of these technologies to process vast quantities of data and assist with condition monitoring tasks. However, the company insists that human engineers must remain 'in the loop' to validate, interpret and act upon technical data, particularly aboard increasingly complex and automated vessels.

"AI has a role to play, certainly — especially when it comes to analysing huge data sets generated during operations," said CMT's Managing Director David Fuhlbrügge. "But there are critical

limitations in relying on technology alone. A sensor can tell you a pressure reading or temperature value. It cannot smell burning oil, feel excessive vibration or recognize an unusual sound in the engine room. That's where human intuition, experience and judgement come in."

The company currently does not embed AI in its own monitoring devices, relying instead on sophisticated algorithms to provide reliable data interpretation.

The company suggests that in the future, AI and sensors will be relied upon to flag issues remotely. But crucially, these alerts will still require expert human evaluation, often from shore-based engineers in contact with onboard or visiting crews. CMT envisions a likely shift towards a hybrid model where monitoring is continuous during voyages, with mobile maintenance teams dispatched to address problems in port.

"Ultimately, we anticipate a set-up



Engine performance optimization still needs human-in-the-loop involvement, says CMT's Managing Director David Fuhlbrügge

similar to today's engine manufacturer service models," Fuhlbrügge continued. "Sensors might identify a fault mid-voyage, and a flying repair team would meet the vessel at the next port. But without

someone qualified to interpret those readings correctly, there's a serious risk of either false alarms or overlooked faults."

The concern is compounded by the technical and financial burden of deploying high numbers of reliable sensors across all areas of a ship, especially if these systems themselves become points of failure. AI still lacks the ability to emulate the 'gut feeling' that seasoned engineers develop through years of experience, a critical quality when diagnosing nuanced mechanical issues.

"The shipboard engineer is effectively a multi-sensory detector," Fuhlbrügge added. "They notice smells, vibrations, small changes in behaviour, things no current AI or sensor suite can reliably do. That kind of holistic insight is still uniquely human, and indispensable."

CMT stresses that rather than seeking to replace engineers, AI should be used to augment their abilities, enhancing maritime safety and efficiency through collaboration between people and machines.

"Seasoned engineers see AI as a useful

extension of their own insight. But younger professionals, by contrast, are often more enthusiastic about the prospect of fully automating decision-making, even to the point of removing human involvement. This is as much a cultural shift as it is a technological one," said Fuhlbrügge.

While acknowledging the long-term potential of machine learning to replicate more sophisticated aspects of human reasoning, CMT warns that significant obstacles remain. Chief among them is the need for massive, diverse, and highly contextual datasets to train such systems effectively, as well as the enormous energy requirements to power advanced neural networks — challenges that are yet to be resolved.

In the meantime, the company calls on industry stakeholders to adopt a balanced and pragmatic approach. "Let's not be blinded by the promise of the full autonomous ship. Human engineers are not a relic of the past. They're the best safeguard we have for a safe and reliable

future at sea."

CMT is a leading developer of diagnostic systems for engine performance and fuel quality monitoring, with more than two decades of experience supporting ship operators and engine manufacturers worldwide. Its solutions provide real-time analysis of wear metals, combustion parameters, and fuel contamination — critical indicators of machinery condition. The company's portable and onboard systems are widely used to help prevent failures, optimize maintenance, and improve vessel efficiency.

ABOUT CMT

Founded in 2003, CM Technologies GmbH is a provider of testing and monitoring technology. CMT is recognized for its expertise in machine health monitoring, fuel and lubricant analysis and water testing. The company's world renowned PREMET range of Diesel Performance Monitoring technology can be traced back to engine pioneer James Watt.

Kaiko Systems launches new product 'Kaiko CharterReady' to streamline cargo hold inspection and reporting with an AI-powered app and dashboard for crews

Kaiko Systems has announced the launch of a new product to provide an efficient and more streamlined process for charterers and crews to ensure cargo holds are prepared effectively for loading.

The new product 'Kaiko CharterReady' analyses inspection data to proactively identify potential issues. 'Kaiko CharterReady' streamlines operations, reduces risk of cargo hold rejection and enhances transparency for stakeholders.

Designed specifically for bulk shipping charterers, this product helps charterers ensure vessel readiness and eliminates the inefficiencies of manual reporting, simplifying cargo hold inspections and improving data quality with one centralized platform.

With an estimated 12,000 bulk carriers* operating across the globe, many charterers operate in an increasingly high-stake environment where even small mistakes in cargo hold preparation can result in delays, damage claims, or financial loss.

Traditionally, cargo readiness assessments were managed through Excel-based reports, where crew members manually insert photos into individual cells, and others review and interpret them within the same file — making the process

time-consuming, cumbersome, and prone to errors. Kaiko replaces this outdated approach with a modern, integrated system that provides clarity and control from ship to shore.

The technological solution provides a centralized dashboard that gives charterers an overview of cargo hold status, preparation progress, and inspection history across their fleet. Instead of navigating multiple files and fragmented reports, teams can now access structured, reliable data in one place, reducing time spent on document collection and improving transparency across operations.

The onboard inspection process is supplemented by Kaiko's AI-driven technical assistant KAI, enabling crew members to follow structured workflows, capture consistent photographic evidence, and submit standardized reports directly from their devices — reports which charterers can not only share with cargo owners but also analyse in depth. With KAI, charterers can easily review the condition of all holds, supported by a complete visual overview alongside crew feedback, enhancing transparency and enabling faster, data-driven decisions. This mobile-first approach ensures that incoming vessel data is both complete and

immediately actionable.

By analysing inspection data in real time, KAI proactively identifies potential issues such as residue, hatch cover damage, corrosion and cracks. These early warnings help charterers address problems before they lead to cargo claims, ultimately reducing risk and improving voyage outcomes.

Fabian Fussek, CEO and Co-Founder of Kaiko Systems, comments: "From our discussions with charterers it was clear that what they required was less time chasing paperwork and more time making decisions based on reliable data. Our solution eliminates the guesswork and empowers charterers to manage cargo readiness with confidence and speed."

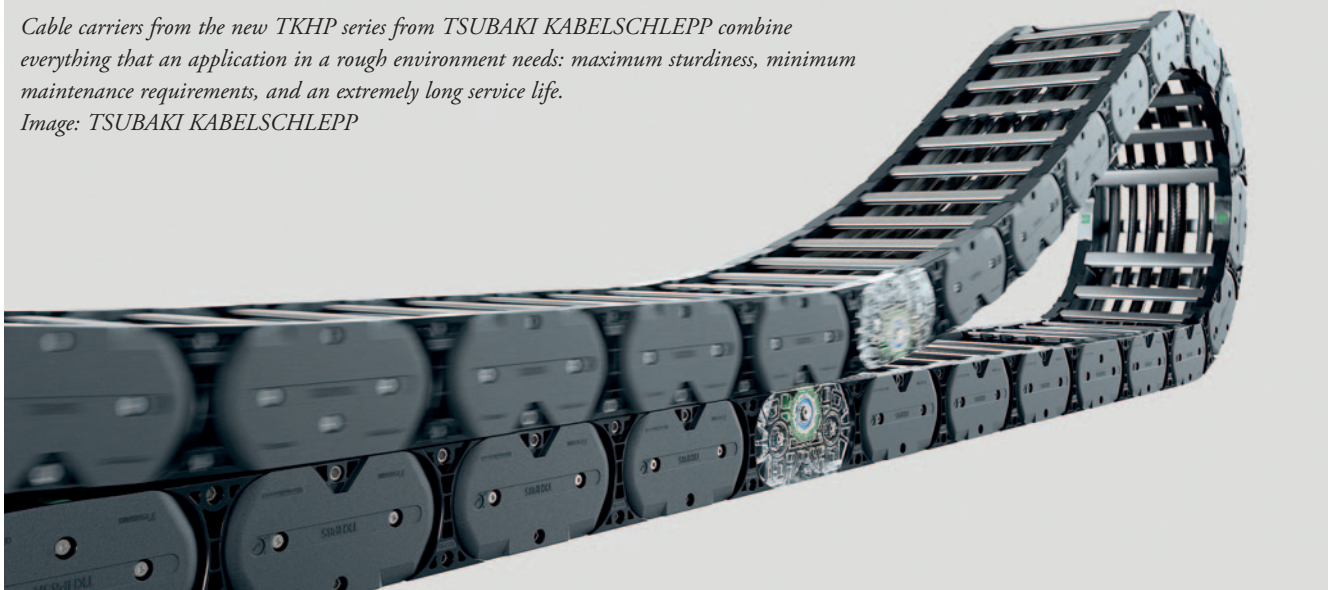
The new product is designed for scalability, requiring no custom development and offering immediate value for charterers of all sizes.



New TKHP high-performance cable carrier from TSUBAKI KABELSCHLEPP

Cable carriers from the new TKHP series from TSUBAKI KABELSCHLEPP combine everything that an application in a rough environment needs: maximum sturdiness, minimum maintenance requirements, and an extremely long service life.

Image: TSUBAKI KABELSCHLEPP



INSPIRED BY GRIZZLY BEARS

Uncompromisingly sturdy, a solid appearance, and unbelievably tough: the development of the new TKHP cable carrier series from TSUBAKI KABELSCHLEPP was inspired by grizzly bears. Because the TKHP series impresses with power, robustness, and — most importantly — longevity, just like the bear that remains undaunted even by the toughest conditions.

“We designed the new TKHP for reliable and efficient cable routing in heavy-duty applications with travel lengths up to 1,500 metres in rough conditions,” explains Peter Pütz, Vice President Marketing & Innovation at TSUBAKI KABELSCHLEPP. “The areas of application include port cranes and the transport of bulk materials. The cable carriers can absorb a high level of force. They are highly durable and dirt-resistant and their special design elements protect the inserted cables in complex environments.”

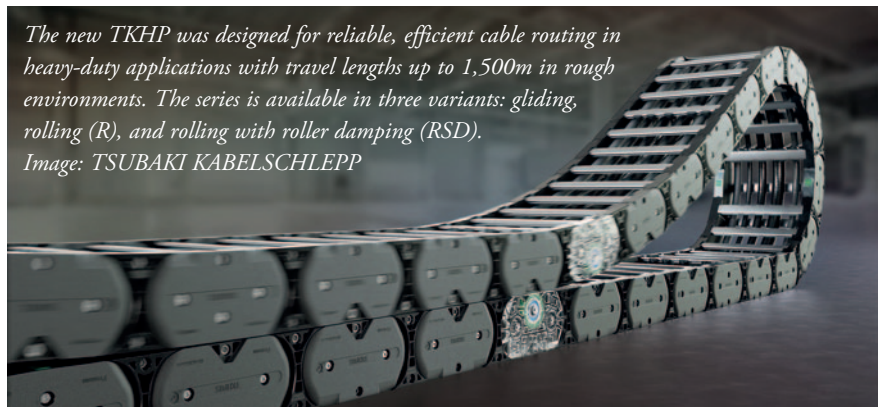
The TKHP series (HP stands for “high performance”) is available in three variants: gliding, rolling (R), and rolling with roller damping (RSD). With an inner height of either 58mm (TKHP 85) or 92mm (TKHP 90) and variable widths thanks to 1mm increments, the series can be flexibly adapted to virtually any installation situation. Depending on the cable carrier type, maximum additional loads per carrier meter between 30kg and 100kg as well as travel lengths between 100m (without rollers) and 1,500m can be implemented. The variants with rollers enable speeds of 10m/s and an acceleration of up to 50m/s².

THE DESIGN: STRONG TO THE LAST DETAIL

The performance of the TKHP is based on

The new TKHP was designed for reliable, efficient cable routing in heavy-duty applications with travel lengths up to 1,500m in rough environments. The series is available in three variants: gliding, rolling (R), and rolling with roller damping (RSD).

Image: TSUBAKI KABELSCHLEPP



a clever design concept: the symmetrically positioned longitudinal axis, for example, ensures optimum force transmission in the cable carrier system and a reduction of the torques occurring in the cable carrier turning point. The encapsulated stroke system, the dirt-resistant and self-cleaning outer contour, and the reinforced pin hole connection meet the highest requirements in terms of robustness. The solid sidebands with bolted chain links and a special double-fork and tab design also support the sturdiness of the TKHP.

“The new TKHP series places a special focus on durability,” stresses Peter Pütz. “We optimize this with the right materials, numerous intelligent features in the cable carrier design, and a sustainable service concept for the product. The design aspects include wear-free damping in the stroke system and aluminum opening stays that are gentle on the cables and resistant to seawater.”

INNOVATIVE ROLLER DAMPING: FOR OPTIMAL SMOOTH RUNNING

Thanks to the polygon-optimized outer contour, an integrated brake, and the virtually gap-free running faces with pins

between the chain links, the cable carriers are not only highly durable, but also particularly quiet. The small pitches of 85 or 90mm also support the lower noise emissions. The smooth running of the cable carriers is also promoted by the innovative roller damping that is used in the TKHP 85-RSD and TKHP 90-RSD. The damping lowers the mechanical load when the carrier moves over the rollers by up to 50%. This reduces not only noise, but also wear.

“The roller damping is a real game changer — without additional mechanical parts like bolts or springs,” explains Peter Pütz one of the USPs of the new cable carriers. “This reduces complexity while increasing reliability.” The ‘grip grooves’ on the running faces are another clever detail. These ensure that the rollers have optimum grip even in environments with fine dust, for example in cement or coal plants. This makes one-sided wear caused by blocked rollers a thing of the past.

POWERFUL AND SUSTAINABLE: THE PERFECT COMBINATION

In addition to its performance, sustainability was another factor for the



The smooth running of the cable carriers is promoted by the innovative roller damping that is used in the TKHP 85-RSD and TKHP 90-RSD. The damping reduces the mechanical load when the carrier moves over the rollers by 50 %. Image: TSUBAKI KABELSCHLEPP



The 'grip grooves' on the running faces are another clever detail of the TKHP series. These ensure that the rollers have optimum grip even in environments with fine dust, for example in cement or coal plants. Image: TSUBAKI KABELSCHLEPP



The pins with which all cable carrier types are equipped ensure an almost continuous running surface, contributing to the smooth running of the system.

Image: TSUBAKI KABELSCHLEPP



The complete range of accessories (channels, strain relief elements, connections, cables, etc.) and a condition monitoring system are available from the TSUBAKI KABELSCHLEPP portfolio.

Image: TSUBAKI KABELSCHLEPP

development of the TKHP series. The cable carriers are currently produced with a content of up to 40% recycled materials, with this figure set to increase in the future.

The recycled materials come from single-material recycling sources. In addition to this, the manufacturing processes at the KABELSCHLEPP site in Wenden-Gerlingen with a focus on energy efficiency, the high-quality materials, and a comprehensive service concept all support the environmental performance of the TKHP series. "Because the most sustainable product is the one that lasts the longest," points out Peter Pütz.

The rolling versions of the TKHP series reduce the energy required for moving the cable carrier by up to 70%, require accordingly smaller drives, and produce significantly less material abrasion — a benefit for the environment and for the budget. And last but not least, the cable carriers can be 100% recycled at the end of their life cycle thanks to the use of defined standard materials.

INTEGRATION AND MAINTENANCE: AS EASY AS POSSIBLE

TSUBAKI KABELSCHLEPP attached great importance to ease of operation and maintenance when developing the TKHP series. The cable carriers open to the inside and to the outside, which significantly facilitates installation and maintenance. Another bonus: the variants

with rollers can simply be pulled into existing guide channels and are therefore easy to retrofit — a great advantage for modernization projects.

Another USP of the TKHP series is the extensive range of accessories that TSUBAKI KABELSCHLEPP offers users in conjunction with the cable carriers: guide channels, strain reliefs, connections, and even a condition monitoring system — all from a single source and optimally coordinated. In addition to all this, the modular design of the cable carrier system

enables flexible solutions for (almost) all individual customer requirements.

"The inspiration for our new TKHP series came from a clear need," Peter Pütz summarizes. "We wanted to develop a cable carrier that runs reliably even in the toughest of conditions. During the implementation, we kept refining this idea until eventually we had the TKHP — a cable carrier that offers not only a number of innovative features, but also combines all the positive characteristics of our existing systems."

10 STRONG ARGUMENTS FOR THE TKHP

1. The cable carriers from the TKHP series are available in three variants — gliding, rolling, rolling with roller damping.
2. The innovative roller damping ensures quiet, low-wear running and needs no additional parts such as bolts, holders, or springs.
3. Almost gap-free running faces support quiet running of the cable carriers.
4. Grip grooves in the running faces of the cable carriers ensure perfect functioning of the rollers — even in environments with fine dust.
5. The special outer contour of the cable carrier breaks up any strong, stubborn dirt, creating a self-cleaning effect.
6. Bolted chain links and high-quality materials ensure sturdiness and durability in heavy-duty operation.
7. The cable carriers require only little maintenance. Maintenance work on the TKHP is quick and easy by design.
8. Energy-efficient production, use of recycled materials, recyclability: the sustainability factor was consistently included in the development of the TKHP.
9. The modular design of the cable carrier system is the basis for flexible, customized solutions.
10. The complete range of accessories (channels, strain relief elements, connections, cables, etc.) and a condition monitoring system is available from the TSUBAKI KABELSCHLEPP portfolio.

Sensor Technology Ltd unveils SGR523: a breakthrough in torque and angle measurement

Sensor Technology Ltd recently introduced the SGR523, a state-of-the-art digital rotary torque sensor equipped with an integrated incremental angle encoder. This innovative addition to the TorqSense SGR series sets a new benchmark for precision in torque and angular position monitoring across various industrial applications.

The SGR523 employs non-contact strain gauge technology, eliminating the need for traditional slip rings and enhancing reliability. Its high-resolution angle encoder delivers up to 10,000 pulses per revolution with a remarkable resolution of 0.009°, making it ideal for applications requiring meticulous torque-angle analysis, such as mechanical testing, automated assembly, and process control.

KEY FEATURES:

- ❖ Torque measurement range from 175mNm to 20Nm.
- ❖ Accuracy of $\pm 0.1\%$.
- ❖ High mechanical overload capacity of 400%.
- ❖ Overrange reading capability of 250%.
- ❖ High digital sample rate of 4,000 samples per second.
- ❖ Digital outputs: RS232 and USB (standard); CANbus and Ethernet (optional).
- ❖ Bi-directional angle and rotation count.
- ❖ Speed measurement up to 9,000RPM.
- ❖ Compatible with TorqView Advanced Torque Monitoring Software.
- ❖ Lifetime warranty.



The SGR523's advanced capabilities enable engineers to detect mechanical anomalies, such as rotational stiction or thread damage, by analysing torque versus angle plots. This dual-parameter monitoring is crucial for quality assurance in manufacturing processes, including bottle cap tightening and bolt fastening.

Additionally, the sensor's ability to monitor torque at specific shaft angles aids in identifying potential issues in process control applications, thereby reducing production wastage. Its high-resolution angle measurement also facilitates precise

motion control, allowing for better management of inertia in motion platforms and improved safety in automated machinery.

The SGR523's design simplifies system architecture by combining torque and angle measurement into a single unit, reducing component count and enhancing system reliability. Its robust construction and advanced diagnostics, including Built-In Test (BIT) self-diagnostics and shaft temperature monitoring, ensure consistent performance even in demanding environments.

Liebherr Connect – connecting people, cranes, and digital environment

With broadly scalable connectivity solutions, Liebherr offers its customers and partners access to comprehensive device data and digital solutions that significantly optimize work processes.

Liebherr Connect supports customers at important milestones in their digital transformation and paves the way for more efficient and safer use of equipment and systems.

For Liebherr, the individual needs of customers are the top priority when it comes to digitalization. The Group always pursues the goal of creating measurable added value for customers and partners and thus realizing time and cost benefits as well as safe and convenient operation of appliances and systems — Liebherr Connect also makes all of this possible. It is



Liebherr Connect offers efficient data exchange and intelligent device communication.

a central prerequisite for monitoring component or appliance statuses and enables the efficient exchange of data.

INTELLIGENT DEVICE NETWORKING

Today, specialists at Liebherr are actively working across all product segments to

help shape the digital transformation in numerous industries. This also includes new possibilities for device and system networking. With Liebherr Connect, Liebherr-Rostock GmbH enables a connection between people, appliances and the digital environment. Thanks to

intelligent networking, Liebherr's maritime equipment is accessible at all times and can run digital solutions such as LiDAT smartApp or XpertAssist. The LiDAT smartApp analyses crane performance data and monitors the device in real time, while XpertAssist offers location-independent access to cranes and technical support via a real-time audio-video connection.

Liebherr Connect is also the basis for all other types of component or device condition monitoring. It enables efficient data exchange and opens up numerous possibilities for Liebherr customers, but also for Liebherr employees, who continuously develop the equipment further and adapt it to individual customer requirements.

NETWORKING INTO THE DIGITAL LIEBHERR WORLD

The hardware integrated into Liebherr

devices, whether purchased or retrofitted, ensures the networking of the devices in the digital world of Liebherr and enables access to LiDAT Web.

This networking is available for various maritime cranes, including mobile harbour cranes, offshore cranes, ship cranes and port and handling solutions. In line with Liebherr's commitment to support customers and partners throughout the entire lifecycle of the applications, Liebherr Connect enables customers and partners to take full advantage of modern technology and optimize their work processes.

ABOUT LIEBHERR-ROSTOCK GMBH

Liebherr-Rostock GmbH is one of the leading European manufacturers of maritime handling solutions. The product range includes ship, mobile harbour and offshore cranes. Components for

container cranes are also included in the product portfolio.

ABOUT THE LIEBHERR GROUP

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 industry-leading solutions to its customers.

Loibl's Service Commander monitors conveyors in real-time

In conventional systems, the actual condition of a conveyor must be monitored by regular, manual inspections. This causes a permanent conflict between the economical operation of an equipment and its reliable maintenance. For this problem, Loibl has developed a measuring system, which is used for the functional check relating to the operation of critical conveyors. Undetected operating conditions, which could be detrimental to safety and efficiency, are continuously measured in real time.

The basis of the measurement system is innovative software, which is connected to the Loibl Service Controller. The Service Controller then transfers current measurements, statistics and tables to the end-user workstation.

ADAPTING CONVEYOR SYSTEMS TO THE INTERNET OF THINGS

Abnormal velocities, seized submerged idlers or exhausted take-up lengths are often detected too late with conventional inspections. The Service Commander from Loibl makes databased facts available by means of which the condition of the conveyor can be determined immediately. This makes it easier to take the advantage of single services, which is effectively saving costs in the long term.

THE SERVICE COMMANDER CAN OPTIMIZE:

- ❖ check and slow down wear on the conveyor chain;
- ❖ determine decreasing preload force;
- ❖ prevent overloading of the conveyor;

- ❖ track the rotation of the return sprockets;
- ❖ monitor the performance of the drive;
- ❖ enable targeted intervention in the production flow;
- ❖ avoid unnecessary downtimes; and
- ❖ optimize operational safety of the conveyor system.

SIMPLE DATA REPRESENTATION

For the visualization of the measured data, all hardware end-user devices (desktop PCs, laptops, tablets, smartphones) are suitable. A solid LAN or WLAN connection and a mobile network are required.

EFFECTIVE MEASUREMENTS

Several sensors ensure the perfect control of conveyors: The sensors are attached at different points in the conveyor and are used for the

Automatic chain tensioning: the LASHXTENSION® is an essential part of the wet deslagger with integrated Service Commander developed by Loibl. The patented automatic chain tensioning from Loibl is used for the functional check of the chain running and ensures that both chain strands elongate identically.

Vibration sensors: the drive is considered as the most important element of a conveyor. Vibration sensors in the conveyor detect and analyse inadmissible noises, thus allowing a preventive protection against damages. Additionally, the oil temperature of the gearbox is measured.

Oil-ageing sensor: An oil-ageing sensor

checks the flowability and lubricity of the gearbox oil.

Temperature sensor: the temperature sensor can protect the drive from overheating.

Roll motion measurement: seized submerged idlers can disturb the operation and result in chain breakage due to excessive tension. The sensors measure the movement of the idlers at regular intervals to detect possible malfunctions in real time.

BENEFITS OF THE SERVICE COMMANDER

- ❖ longer service life;
- ❖ better wear protection;
- ❖ real-time data analysis;
- ❖ less energy consumption;
- ❖ improved operational safety;
- ❖ automated, continuous measurement;
- ❖ web-based data access, no additional App necessary;
- ❖ quick return on investment by fact-based budget planning;
- ❖ Cloud-based database: data available for permanent access;
- ❖ quick availability of the data on mobile phones, tablets, PCs, etc.;
- ❖ increased cost-effectiveness by specific planning of the service costs; and
- ❖ QR-Code: Via QR-Code directly on the equipment/machine or online different Loibl services are accessible, including detailed operating instructions as well as Loibl's comprehensive spare and wear parts service.

HarborLab is transforming port cost management for dry bulk operators with data and AI-driven solutions



HarborLab is an independent maritime technology company based in Athens, Greece, that is redefining port cost management and operational efficiency for dry bulk operators through its data and AI-powered platform. Founded in 2020 by maritime expert Antonis Malaxianakis, HarborLab has rapidly become a trusted partner for shipowning and ship management companies, offering digital solutions that enhance cost transparency, streamline workflows, and improve decision-making.

EMPOWERING DRY BULK OPERATORS WITH TECHNOLOGY

Dry bulk vessels operate in a highly competitive and cost-sensitive environment, where managing port expenses efficiently can significantly impact profitability. HarborLab's digital platform simplifies Disbursement Account (DA) analysis, ensuring precise cost estimates, seamless expense validation, secure payments, and faster claims processing.

With over 2,000 vessels registered in the platform and 4,500 port agents, 35,000 port calls processed to date, HarborLab's technology provides an essential tool for bulk carriers navigating a complex global market.

KEY SOLUTIONS FOR BULK VESSEL OPERATORS

1. HL AI – THE FIRST AI-POWERED DISBURSEMENT AGENT

Managing port expenses has long been a challenge for bulk carriers, with \$130 billion spent annually on port costs across the shipping industry. Traditionally, companies relied on manual DA checks or outsourced the process, leading to inefficiencies, inconsistencies, and hidden errors. HL AI revolutionizes this process by automating DA analysis, enabling bulk vessel operators to:

- ❖ Instantly see how each port expense is calculated, using the latest tariff data.
- ❖ Translate official tariff pages into English, eliminating language barriers.
- ❖ Accelerate negotiations with AI-generated emails for cost discrepancies.
- ❖ Triple DA review capacity per user, reducing administrative burdens.
- ❖ With HL AI, bulk carriers gain full control over port spending, eliminating unnecessary costs and ensuring tariff compliance across all ports worldwide.

2. HARBORLAB MARKETPLACE — OPTIMIZING HUSBANDRY SERVICES

Beyond cargo operations, dry bulk vessels require efficient husbandry services for crew changes, spares delivery, and refuelling. HarborLab's Marketplace connects shipowners and ship managers with trusted port agents worldwide, enabling them to:

- ❖ Compare service providers quickly and transparently.
- ❖ Select agents based on quality and cost efficiency.
- ❖ Manage service agreements and payments digitally.
- ❖ This enhances operational efficiency, reduces risks, and ensures cost-effective husbandry solutions at any port.

3. DIGITAL STATEMENT OF FACTS (SoF) — AUTOMATED PORT ACTIVITY TRACKING

The Statement of Facts (SoF) is a crucial document, affecting demurrage claims and operational transparency. HarborLab's Digital SoF automates the logging of vessel activities, providing:

- ❖ Real-time, verified timestamps for arrival, cargo handling, and departure.
- ❖ Automated claim management,

reducing disputes with charterers.

- ❖ Seamless integration with leading ERP and voyage management systems.

By digitizing SoF processes, HarborLab enables bulk vessel operators to save time, improve accuracy, and optimize cost recovery.

TRUSTED BY INDUSTRY LEADERS

HarborLab is proud to support top-tier dry bulk operators, including major clients such as Oldendorff, Star Bulk, Zodiac Maritime, Great Eastern Shipping and other leading bulk carriers. HarborLab's solutions have delivered measurable results, including significant cost savings and enhanced operational transparency.

EXPANSION, INNOVATION, AND COMPETITIVENESS

HarborLab continues to grow its global presence, backed by \$16 million in Series A funding in 2024. The company is expanding into Asia reinforcing its market leadership and developing new AI-driven tools to further enhance port cost management.

HarborLab's recent acquisitions of SOFeXchange and DEMeXchange have strengthened its capabilities in digitizing Statement of Facts, ensuring full transparency in cargo operations. Additionally, it has been recognized with multiple industry awards, including:

- ❖ Lloyd's List Next Generation in Shipping Award (2022)
- ❖ Lloyd's List Intelligence Big Data Award (2024)
- ❖ Great Place to Work Certification (2021-2024) and Best Workplace in Tech (2023, 2024)

THE FUTURE OF BULK SHIPPING OPERATIONS

HarborLab is at the forefront of maritime digitalization, pioneering AI and automation to optimize bulk shipping operations. As the industry moves toward greater transparency, efficiency, and cost control, we remain committed to delivering cutting-edge technology that empowers vessel operators worldwide and building trust in the maritime industry.

For dry bulk owners and operators looking to eliminate port cost inefficiencies, improve DA accuracy, and enhance financial transparency, HarborLab offers the future of port cost management — today.

Oceanly introduces Enterprise, a complete cloud-based suite of integrated software solutions

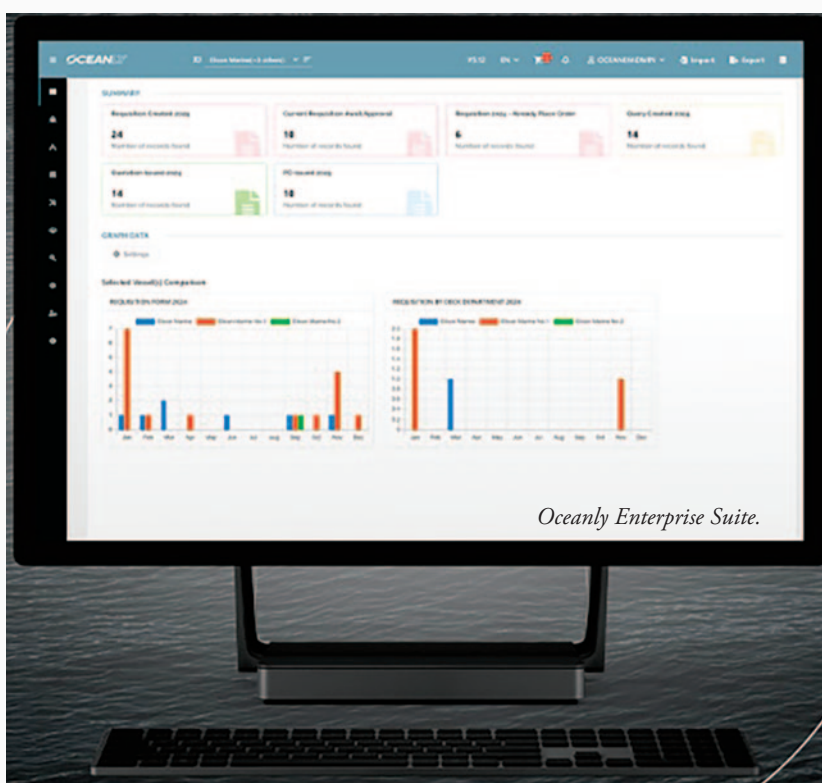
Oceanly, a leading innovator in maritime software, has expanded its product portfolio with the launch of Oceanly Enterprise, a fully integrated, cloud-native ERP suite tailored specifically for the shipping industry. Designed to replace legacy systems and siloed processes, Enterprise delivers a unified digital environment that connects departments, streamlines operations, and reduces friction across entire fleets.

Already in use across a diverse range of shipping companies in Asia, Enterprise has proven its reliability, scalability, and user-friendliness. The solution is now being introduced to global markets, bringing its success to a wider audience of shipowners, managers, and operators.

Building on the success of Oceanly Performance — one of the most advanced fleet management platforms available — Enterprise adds powerful ERP functionality through four core modules:

- ❖ **Maintenance & spares:** prevent unplanned downtime with predictive and condition-based maintenance powered by real-time vessel data.
- ❖ **Procurement:** automate purchasing and track delivery timelines with full integration to vessel itineraries and inventory levels.
- ❖ **Crewing:** monitor certifications, manage crew changes, and receive alerts on visa compliance and port entry issues.
- ❖ **HSQE:** centralize compliance and safety data, simplify audits, and automate document control and reporting.

“Enterprise was built to bring the maritime sector into the modern digital era,” said Giampiero Soncini, Oceanly Board Member and ERP expert with more than 30 years of experience, including a long tenure as CEO of SpecTec. “Most systems in the market are still running on outdated technology, even if they look polished on the surface. Underneath, they rely on legacy frameworks and obsolete Object-Oriented Languages, and other unsupported technologies. Oceanly Enterprise is built from the ground up using .NET, Java, and Angular, making it



fully cloud-deployable, with unmatched flexibility and performance.”

The platform’s speed of deployment sets a new benchmark in the industry.

“In many cases, we’ve been able to migrate a vessel’s entire dataset in under two hours — without breaking internal links,” Soncini added.

The true strength of Enterprise lies in its deep integration with Oceanly Performance. Together, the two platforms offer real-time situational awareness and decision support that siloed systems simply cannot match.

“What truly sets Oceanly apart is the seamless integration between Oceanly Performance and Oceanly Enterprise,” said Frederik Lerche-Tornoe, CEO of Oceanly. “While others offer fragmented tools or simply developed new layout on top of the same, legacy frameworks, we deliver a well-tested, modern and unified Cloud solution designed specifically for the maritime industry — by people who understand it from the inside out.

“Real-time data from ship operations flows directly into enterprise-level decision-making, enabling everyone from the engine room to the boardroom to

work with the same, trusted information. This eliminates silos, reduces manual work, and drives faster, smarter decisions across technical, operational, and commercial teams. Our customers don’t just monitor performance, they manage it, strategically and efficiently. That’s the power of Oceanly.”

Oceanly Enterprise is launched in close collaboration with Elicon, a Singapore-based maritime technology partner. The strategic partnership between the two companies is built on clear agreements, personal mutual trust, complementary extensive expertise, and a shared vision for a smarter, faster, and more transparent shipping industry.

“We’ve combined our deep maritime domain knowledge with cutting-edge engineering,” said Soncini. “This partnership ensures we can deliver a product that meets the industry’s real-world needs, not just cosmetic changes on 25 years old software.”

Oceanly is continuing its global rollout of Enterprise, building on its strong foundation in Asia and expanding into Europe, the Middle East, and the Americas throughout 2025.

Hexagon accelerates large-scale aerospace inspection with laser tracking and direct scanning in one automation-optimized device

The Leica Absolute Tracker ATS800 is a pioneering system that combines reflectorless laser scanning and tracking in one compact device. It enables high-accuracy inspection of large structures like hulls, decks and bulkheads without scaffolding, physical targets or time-consuming manual processes.

Addressing large-scale manufacturing challenges head-on, the ATS800 offers automation-enabled inspection that saves time, improves repeatability and supports quality control at the speed of modern production:

- ❖ Cuts large-structure inspection time from hours to minutes — with high-accuracy reflectorless scanning at up to 40 metres powered by patented TruePoint technology, no scaffolding or target placement required.
- ❖ Portable for manual and automated use — small form factor, wireless connectivity and battery operation allow easy movement around large parts as well as deployment on AMRs and robots using SDKs for seamless integration, offering sites a path to “third-shift” and robotic inspection workflows.
- ❖ Enables real-time assembly — track and measure moving components in real-time during assembly using a combination of reflector measurement and direct scanning, eliminating the need for two separate devices and stop-measure cycles during alignment, mating and integration.

As aerospace manufacturers race to ramp up production amid labour shortages and rising costs, Hexagon’s Manufacturing Intelligence division has launched the Leica Absolute Tracker ATS800 — a next-generation laser tracker for high-mix, large-structure production environments. The system represents an entirely new quality inspection solution in large-scale manufacturing areas such as aerospace and wind energy, delivering direct scanning accuracy comparable to reflector measurement systems, packaged within a highly portable lightweight design.

With seamless integration into digital and robotic automation workflows, the ATS800 dramatically reduces inspection time while enabling real-time measurement and process alignment. A key innovation is FeatureDetect, an automatic feature recognition capability that identifies key

part geometries without the need for manual programming. By reducing operator workload, FeatureDetect unlocks significant productivity gains in both automated and manual inspection processes.

FeatureDetect operates from CAD data or independently, using the ATS800’s built in high-resolution panoramic camera. This wide aspect live image feed allows the system to recognize features directly from the physical part, accelerating set-up and streamlining inspection.

Engineered for safety-critical industries where manual inspection of large and complex structures often creates bottlenecks, the ATS800 combines high-accuracy direct scanning and reflector tracking in a single compact system. With setup times reduced from hours to minutes, it supports unattended or in-process inspection — from fuselage alignment to composite layout— without compromising on accuracy or traceability.

DIGITALLY AUTOMATED HIGH-ACCURACY SCANNING

The ATS800 merges Hexagon’s renowned laser tracker technology with high performance direct scanning, in a single compact device. Performing high-accuracy reflectorless measurements at ranges of up to 40 metres, the ATS800 captures detailed data on key features like edges, holes, slots and threads without physical contact or close-proximity scanning.

For even greater flexibility, full 3D reflector tracking capability further accelerates alignment and set-up processes across large-structure inspection and assemblies.

New AI-powered FeatureDetect technology removes a significant bottleneck in large-structure metrology by identifying what to measure and how. Operating from CAD or panoramic camera view, it streamlines programming and enables more agile, autonomous workflows with less reliance on experts.

Compatible with widely used metrology software platforms such as PC-DMIS, SpatialAnalyzer and third-party alternatives, the system fits easily into existing inspection workflows. It’s automation-ready, offering customers a plug-and-play path to scalable, high-throughput inspection through using the HxGN Robotic Automation software.



Hexagon’s Leica Absolute Tracker ATS800 is now available globally.

ROBOTIC AND AGV/AMR AUTOMATION

Despite its advanced capabilities, the ATS800 has been engineered with portability and deployment flexibility in mind. Its compact form factor allows for flexible mounting in any orientation — even upside down — and seamless deployment on AMRs, gantries, lifts, rails and robot arms, supporting safe, space-efficient operations on busy shop floors.

With a well-established and fully supported SDK, the ATS800 can be embedded into complex robotic workflows, enabling automated feature measurement, dynamic part tracking and closed-loop process control in real time. Whether integrated with a fixed station lift-and-rail combination, or patrolling large assemblies on an AMR, the ATS800 gives engineers a versatile metrology solution for lights-out inspection or continuous quality assurance.

UNLOCKING “THIRD-SHIFT” WORKFLOWS AND REAL-TIME ASSEMBLY

As production scales across aerospace and other large-structure industries, the ability to perform overnight or in-process inspection is becoming essential. The ATS800 unlocks ‘third-shift’ workflows with unattended scanning, real-time tracking, and subassembly alignment — all backed by full digital traceability. Whether guiding fuselage integration or layer-by-layer composite inspection, it ensures high precision without interrupting workflows.

At the heart of the system is Hexagon’s TruePoint Interferometer, a next-generation measurement engine that minimizes noise and delivers pinpoint accuracy, even on challenging surfaces or at very steep angles.

Expansion project for shiploaders with ZOLLERN winches

CUTTING-EDGE DESIGN WITH ENHANCED SAFETY FEATURES

The ZOLLERN Group is one of the oldest family-owned businesses in Germany, with over 315 years of technology and innovation, writes *Thomas Liepin* — Application engineer. ZOLLERN develops, produces, and services a wide range of high-quality metal products. With its four business areas and nine product divisions, ZOLLERN is synonymous with high quality, innovative technologies, and reliable service worldwide. The business units include drive technology, investment casting, sand casting and forging, as well as steel profiles.

ZOLLERN DRIVE TECHNOLOGY

ZOLLERN drive technology specializes in gears and winches, electric drives, hydrostatic bearing systems, rotary table systems, and automation. Gears and winches represent the largest share of the business. From construction machinery and ship and harbour cranes to the mining industry, energy technology, machine tools, and the automotive industry, the products are used worldwide in various applications.

EXCELLENCE IN WINCH TECHNOLOGY

ZOLLERN winches are used in the harshest conditions. They are characterized by excellent winding quality with low wear on the rope.

The heart of the winches is the integrated planetary gearbox from ZOLLERN with its high efficiency and power density. The planetary gearboxes are based on a modular system, allowing application-specific solutions to be realized with a high number of standard components.

The different sizes of the modular system can transmit power range 1,000Nm to >2,000,000Nm (rope pull forces on the drum up to 2,650kN).

POWERFUL WINCHES FOR WESTSHORE TERMINALS

In mid-June 2024, ZOLLERN commenced the design of powerful winches for Westshore Terminals in Canada, at the request of ALPINE Bulk Materials Handling, a NEPEAN-owned engineering, consulting, and equipment supply company in the field of continuous mining and bulk materials handling. ALPINE is supplying two shiploaders and upstream conveyors as part of Westshore's Potash Expansion Project.

The project required a robust design combined with reduced weight for

operation in a coastal area. Two winches, designed for left-hand and right-hand operation, will lift the main boom of the shiploader.

DESIGN WITH SPECIAL AND SAFETY FEATURES

The drive unit of the ZHP 4.36 rope winch includes a 150HP frequency-controlled electric motor, an elastic coupling, and a disc brake as service brake. The winch is equipped with an additional redundant disc brake on the rope drum for emergency braking. The hydraulic power unit provided by ZOLLERN converts energy to power the four hydraulic caliper brakes, which activate quickly in emergencies and hazardous situations.

For maintenance, the winch features a ratchet mounted on the rope drum and a pawl mounted on the winch frame, equipped with proximity sensors for safety. During maintenance, the drum can be secured to prevent any movement.

The rope winch has been coated with special paint in the shade RAL 1023, as requested by the customer, to ensure protection in coastal areas, including resistance to UV radiation. The nominal rope tension of the ZHP 4.36 winch is approximately 25 tonnes, with a rope

diameter of 40mm. A four-stage gearbox has been integrated into the rope drum, featuring a special intermediate flange for possible on-site gearbox dismantling.

The final weight of the drive unit, excluding the motor, is over 13 tonnes, with packing dimensions of approximately 385 x 300 x 300 cm.

REAL-TIME MONITORING AND PREDICTIVE MAINTENANCE

The rope winches are equipped with numerous sensors to record speed and position, as well as wear and condition monitoring. These sensors provide the customer with real-time information on the operating mode of the winch.

Although not included in the scope of supply for this winch, the ZOLLERN Drive Guard is available for additional condition monitoring and predictive maintenance. The ZOLLERN Drive Guard allows the condition of ZOLLERN products to be monitored from anywhere in the world, with data recorded in real time. This enables necessary maintenance to be planned in advance, ensuring high system availability. Downtimes and standstill times are minimized, and potential damage is detected early to prevent consequential damage.

ZOLLERN winch design ZHP 4.36 with caliper brakes and ratchet for material handling — Westshore Terminals.



Keeping ahead of the curve

with biomass handling solutions



NORDEN: trusted shipper of biomass products

Major freight services provider NORDEN provides ocean-based freight services for bulk and project cargo of all sizes on its +500 operated fleet, including the shipment of large volumes of biomass products — equal to roughly 3% of the total amount of all the dry cargo handled by NORDEN. The company has been supporting customers within the biomass space for many years.

The main biomass products handled by NORDEN includes wood pellets, wood-chips, wood pulp and a wide range of forestry products such as logs, sawn timber and timber. Last year, NORDEN shipped approximately 2mt (million tonnes) of wood pellets, primarily to customers in

Europe as well as to customers in a wide range of other countries around the world.

ACQUISITION OF NORLAT SHIPPING

To further grow its business within this area and to grow its overall projects and parcelling activities, NORDEN last year acquired the Norwegian dry bulk operator Norlat Shipping, which specializes in the shipment of forest products and other bulk commodities. Upon the acquisition, NORDEN CEO, Jan Rindbo, said: “Norlat is an extremely skilled parcelling business, increasing NORDEN’s access to the Northern European forestry trade, new customers and cargo. Matched with NORDEN’s size and access, there are

significant opportunities for further growth and commercial synergies.”

Since the acquisition, Norlat Shipping has been fully integrated into NORDEN’s Projects & Parcelling business unit. NORDEN has already started to harvest the strong synergies between the businesses with steadily increasing numbers of forestry product shipments. Norlat Shipping has offices in Sarpsborg and Bergen in Norway and an office in Stockholm, Sweden.

BIOFUELS PROPELLING NORDEN’S DECARBONIZATION AMBITIONS

Besides being a trusted shipper of biomass products, NORDEN has an ambition to



decarbonize its customers' supply chains in the here and now. Ever since it performed the first-ever commercial biofuel voyage back in 2018, NORDEN has pioneered the use of biofuels to lower emissions in the shipping industry directly on voyages and through its Book & Claim solutions.

NORDEN's Book & Claim solution allows customers of marine transportation across the globe to take advantage of

emissions reductions from biofuels, even when biofuels are not physically available to be bunkered on a specific trading route or voyage. Last year, NORDEN collaborated with leading US tech company, Meta, to lower its maritime supply chain emissions via the Book & Claim solution.

In 2023, strengthened its future supply of renewable fuels by acquiring a minority stake in Danish-Indian biofuel scale-up,

MASH Makes. The investment places NORDEN at the forefront of the research and development of future renewable fuels, where NORDEN can also benefit from future renewable bio-oils once developed. Since the investment, NORDEN has worked closely together with MASH Makes to validate its product for marine use. Together with MASH Makes, NORDEN recently performed a successful vessel trial





of MASH Makes' biofuel on an auxiliary engine of an ocean-going vessel. The B20 biofuel blend (20% pure biofuel and 80% conventional marine fuel) was consumed during a roundtrip voyage between Singapore and Brazil.

The next trial will be to use biofuel on a main engine. Looking into 2025, NORDEN has the ambition to triple the use of biofuels, supporting its customers in their efforts to lower emissions in the here and now.

ABOUT NORDEN

NORDEN is a global provider of ocean-based freight services for bulk and project cargo of all sizes. It integrates freight solutions with port logistics, helping its customers to optimize and decarbonize supply chains. It provides tailored solutions based on flexibility, reliability and intelligence. The company's agile business model ensures stability by continuously adapting its fleet to market developments and customer needs. Founded in 1871, NORDEN is one of Denmark's oldest internationally operating shipping companies. Incorporated in Denmark, NORDEN is listed on Nasdaq Copenhagen as a part of the OMX Nordic Large Cap index. With 19 offices across 6 continents, NORDEN is a truly integrated part of global trade.



Campostano Group sets its sights on the fast-growing biomass market

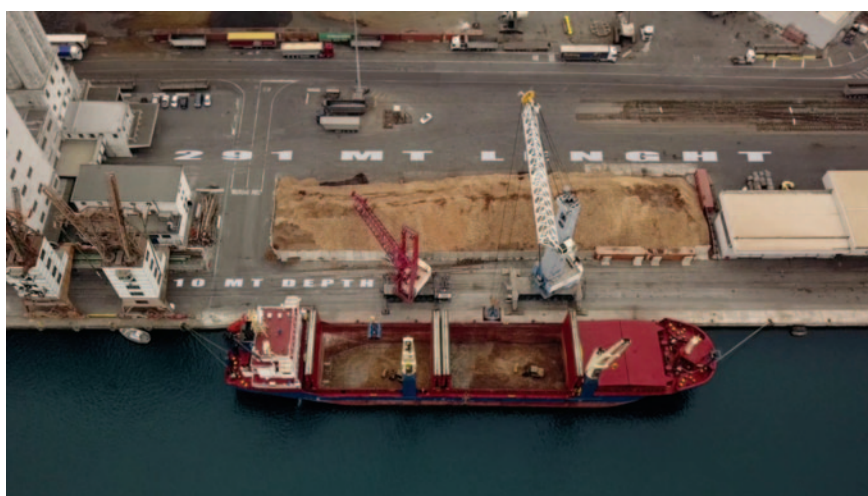


Port of Savona.

Campostano Group (CG) was established in 1927, operating initially as ship agent and freight forwarder, writes *Ettore Campostano, CEO, Campostano Group*. Over the span of four generations, the company has substantially extended the scope of its business while maintaining the shareholding within the family.

Currently, CG controls 20 companies involved in both operations and general services, carrying out the terminal operator, shipbroker and insurance broker activities alongside the traditional ones. With the entry into force of Law 84/1994, authorizing private companies to be active as terminal operators inside public ports, CG invested in the ports of Savona (Savona Terminals) and Genoa (Forest Terminal), focusing its business on specific goods sectors: steel products, forest products and solid bulk.

Savona Terminals (Savona port) is a multipurpose terminal, with three berths in two different port areas. It has an overall length of approximately 700m. There are two berths in the 'Deep Water' area. The first is 400m long, and has a draught of 14.5m. The second is 290m long, with a draught of 10m. The total open area used for storage and operations amounts to 35,000m², while the covered area (warehouse) amount to 35,000m², of which



10,000m are dedicated to bulk commodities. The equipment available includes: four Gottwald Konecranes shore-cranes, with safe working loads (SWL) from 60 to 150 tonnes; two Mantsinen crane; dust-controlled and traditional hoppers; forklift trucks for horizontal handling; and various other ancillary equipment. Over the years Savona Terminals has constantly increased and enhanced its technical equipment and the skills of its workforce.

Thanks to the renewal of equipment and the modern storage solutions, an excellent standard in terms of handling and storage has been achieved, always keeping in mind the commitment to guarantee ships prompt berthing and fast dispatch.

The Forest Terminal (Genoa port) specializes in the handling of forest products. The services offered span from the loading/unloading of breakbulk vessels to the stuffing/unstuffing of containers. The terminal operates on a berth at Ponte Somalia (length 200m, draught 10m). For the storage of goods, 8,500m² of warehouse and 8,000m² of open area are available. The terminal is equipped with one Gottwald shore-crane with an SWL of 100 tonnes, one reach-stacker and fork-lift trucks for horizontal handling.

Among the various activities CG has taken on a strategic direction aimed at developing a rapidly expanding sector: the trade of woodchips (biomass) for energy production. Aware of the growing volume handled connected to this market, CG decided to invest significant resources to improve the management, acting as a link in the logistics/supply chain.

CG approached this trade through agreements with leading local operators. This synergy has made it possible to optimize the complex logistics chain that originates in the forests and concludes with the supply of the power plant. This model of virtuous co-operation brings tangible benefits to the entire related industry.

A key player in the supply chain is the company M.P.G. — Fratelli Mao from Garesio-Savona-Italy, a local producer that believed in the potential of the project from the beginning. A dedication and strategic vision led the company to join the links in the supply chain sign a significant agreement with the EPH Group (Energetický Průmyslový Holding — Czech Republic), one of the most dynamic European players in the renewable energy market. EPH Group's commitment is to provide reliable and sustainable energy, making it a key player in Europe's transition to a net-zero future. Its vertically integrated approach includes the entire energy chain



and crucial markets, including Italy, Germany, UK, Ireland, France, Switzerland, the Netherlands, Slovakia, and the Czech Republic.

EPH Group is more than just a utility company; it's a community of 15,000 employees committed to promoting secure and sustainable energy access, as well as leveraging strategic commodity trading, retail services, and eco-sustainable logistics to meet customer needs.

The final link in the supply chain is represented by the power plant of Biomasse Crotone, Italy (belonging to EPH Group). Through the use of woodchips, the plant releases a significant amount of renewable energy into the market, actively contributing to the energy transition and environmental sustainability. The progressive strengthening of the local supply chain

has led, in recent years, to a significant increase in the availability of biomass from forest maintenance as well as sawmill processing waste, public green pruning, and pruning from various agricultural activities, increasing from approximately 200,000 tonnes per year to 400,000 tonnes; a portion of this is handled through Crotone hub port and Savona port too.

The synergistic cooperation between Campostano Group, M.P.G.-Fratelli Mao, and Biomasse represents a concrete example of how cooperation between different players can generate added value for the entire territory. Optimization of logistics chain, valorization of local resources and production of renewable energy are the pillars of a sustainable and promising development model for the future.

Wide range of products pass through HES Gdynia bulk terminal – including biomass

HES Gdynia is one of the largest dry bulk terminals in Poland, located in Port of Gdynia, Northern Europe at the Baltic Sea. This geographical location makes it a strategic worldwide logistic link for agriculture commodities, energy resources and other dry bulk markets — including biomass.

Beyond standard handling operations for the variety of dry bulk products, including biomass, grains, feedstuffs, iron ore, coke and coal, the HES Gdynia bulk terminal offers both open and covered storage solutions, along with the warehouses equipped with advanced and cutting-edge automation technology.

At this facility, the terminal also provides direct berth loading and discharge services for liquid bulk products, such as a wide range of fuels and petrochemicals, onto or from trucks and railcars with optional heating or nitrogen supply.

HES Gdynia takes a proactive approach to managing workplace safety and health at its premises, incorporating practical improvements in day-to-day operations. It

UPDATED DATA ON HES GDYNIA BULK TERMINAL	
Open storage capacity:	83,489m ²
Covered storage capacity:	353.018m ³
Access by:	Vessel barge rail truck
Maximum draught:	14.20m
Dry bulk products:	Agricultural commodities biomass minerals aggregates iron ore cokes met coal steam coal
Dry bulk services:	Handling warehouse storage open yard storage weighing. A modern and diversified fleet of grab hook cranes, hoppers, wheel loaders, rolling equipment, rail and truck weighbridges, and import warehouse automation technology
Handling:	140 professionals at work
Certifications:	ISO 9001 ISO 14001 ISO 45001 ISO 22000 GMP+ AEO ISO 27001

is alert to the potential environmental impact of its operations, and the effect on the local community, so it implements special measures to reduce them.

The seamless connections by sea, rail, and road, along with constantly enhancing efficiency of handling operations and storage capabilities, allow HES Gdynia to deliver the expected high-quality service to

its bulk trading partners, as well as to tackle the logistic dynamics within bulk supply chains.

Knowledge, dedication, decades of experience and ever-growing innovation capacity makes HES Gdynia a competent and sustainable logistic partner to rely on, now and in the future.



Wind fences: the referees of biomass

Just like an enthusiastic player who could win the game but keeps committing fouls and going out of bounds, biomass has tons of energy — but managing this type of player isn't always easy and it can become disruptive if not handled correctly. Queue the referee whose role it is to deal with the behaviour of unruly players and make sure the game flows smoothly and stays under control. Wind fences are the referee of the biomass industry — making sure that the pesky biomass stays on the field and behaves itself to score big for energy.

THE WIND FENCE REFEREE

WeatherSolve's referee, the wind fence, is a porous barrier erected to alter wind patterns and mitigate dust dispersion. By disrupting wind flow, these fences can decrease wind speeds by up to 80% in localized areas and 50% over larger expanses. A fence that is placed relatively perpendicular windward to the protected area is referred to as an upwind fence. An upwind fence redirects the wind up and over the fence while allowing a small amount of air to still pass through the fence — playing offence. This creates a sheltered zone on the leeward side of the fence. The sheltered zone has significantly reduced wind velocity which allows dust to settle quickly. The small amount of air that passes through the fence equalizes the differential pressure and minimizes the formation of turbulence and wind eddies that are commonly seen with the erection of a solid



Personnel access point incorporated into a cathedral wind fence that controls dust as effectively as the rest of the fence when the door is closed.



A WeatherSolve Structures cathedral style wind fence with conveyor access points for a wood chip stockpile in South America.

windbreak. Conversely, when a wind fence is placed relatively perpendicular to outgoing winds, it is referred to as a downwind fence — playing defence. A downwind fence acts as a catch fence and has a small sheltered area in front of the fence that allows dust particles to drop out of the air and collect. A small amount of the dust will still pass through the fence, but quickly falls to the ground in the protected zone on the leeward side of the fence, just as with the upwind fence. As wind directions change, an upwind fence may function as a downwind fence and a downwind fence may function as an upwind fence.

INCORPORATE A WIND FENCE TO LEVEL THE PLAYING FIELD

Biomass operations are fraught with dust — from grinders and chippers to drying and conveying, dust is literally kicked up at every turn. Organic dust can lead to serious health implications or respiratory

damage and can significantly increase the risk of a combustible dust event. Combustible dust is a deadly player in these operations — one that should be taken extremely seriously and dealt with accordingly. Combustible dust is fine matter dispersed in air that can cause flash fires or explode catastrophically when exposed to an ignition source¹. In the biomass industry, dust can be highly flammable — an unruly player indeed!

Consider a pellet storage facility in Japan that exploded in September 2023. It is reported that the fire ignited at a section of the plant where wood pellets were offloaded². Fortunately, there were no injuries reported, but the explosion caused serious damage to infrastructure.

Dust control strategies such as water trucks and sprays are mainstays in the biomass industry but often do not provide sufficient dust reduction to mitigate risks. Safely managing dust risk is critical — wind fences as dust referees can help reduce fugitive dust down to as little as 1/8th that of an unprotected situation. When biomass dust is dramatically reduced by the incorporation of a wind fence, the playing field is effectively levelled resulting in reduced risk of combustible dust events and improved health and safety, not to

mention less wear and tear on machinery and minimized impact on surrounding communities.

WIND FENCE HOLDS THE LINE AGAINST BIOMASS DUST

The experts at WeatherSolve Structures know precisely how to tackle dust and wind at biomass facilities. Take for example a facility in South America where wind and conveyors were contributing to dust generation and erosion from wood chip stockpiles. WeatherSolve was tasked with developing an effective solution to combat the dust and erosion that could also accommodate site machinery and personnel access. A 430m-long, 33m-high cathedral style fence was designed, engineered, and installed to surround the wood chip storage area. The cathedral (circular) style fence with drilled pile foundations offered significant savings on concrete costs while the 47% aerodynamic porosity woven polyethylene fabric wind fence panels provided optimal wind protection and dust control. Additional fabric flaps were incorporated onto the lower panels to further optimize dust control. The outcome was a great success. The fence effectively manages dust without impacting daily site operations.

FINAL WHISTLE: BIOMASS DUST GETS BENCHED

In the high-stakes game of biomass operations, dust is the rowdy player no one wants on the field — unpredictable, dangerous, and always ready to foul up your operation.

Enter the wind fence: the no-nonsense referee that keeps the game in check, improves team performance (aka plant safety), and helps avoid costly penalties like explosions, equipment damage, or community complaints. Whether it's playing offence as an upwind fence or defence as a downwind fence, the wind fence is the MVP of dust control. If your biomass facility is feeling the heat, maybe it's time to call in the ref and keep your dust from running wild.

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Big in biomass – Loibl's handling technologies are extensive

The use of biomass and co-firing as a renewable energy resource is becoming increasingly important in energy technology.

Loibl has been working with prominent companies and plant operators in the energy generation sector for many years and takes care of the transportation of biomass, slag and ash.

As a specialist in resource-saving conveyor technology, Loibl offers a wide range of conveyor systems for the biomass industry. These conveyor systems are designed to efficiently transport wood chips, pellets, ash, slag and other bulk materials.

By using state-of-the-art technologies and customized solutions, Loibl ensures that the biomass is transported reliably and flawlessly from one station to the next. Depending on the application, it uses different conveying technologies such as screw conveyors, belt conveyors and pneumatic conveying systems to meet the specific requirements of different types of biomass.

Loibl's conveyor systems enable biomass to be used more efficiently and economically as a renewable energy



source. They help to ensure that biomass can be used in energy production in a CO₂-neutral and environmentally friendly way.

CONVEYOR TECHNOLOGY & PLANT ENGINEERING FOR THE BIOMASS INDUSTRY

- ❖ Customized conveying solutions: individually adapted systems for every type of biomass (wood chips, pellets, ash, slag, etc.).
- ❖ High efficiency & cost-effectiveness: reduction of material losses, minimized maintenance requirements, maximum operational reliability.
- ❖ State-of-the-art technologies: ATEX and fire protection-compliant systems for safe and trouble-free operation.
- ❖ Environmentally friendly processes: low-emission & dust-free conveyor technology.



- ❖ Holistic system solutions: from delivery and processing to ash removal & slag disposal.

BIOMASS PLANTS

PERFORMANCE OVERVIEW FOR BIOMASS PLANTS

Loibl is a recognized expert in the field of conveying technology for biomass plants. Its many years of experience enable it to develop customized solutions for the transport of various types of biomass. Loibl attaches great importance to compliance with fire protection regulations and ATEX protection guidelines.

For the transportation of wood chips, Loibl offers various systems that are specially designed for curved tracks. These include trough chain conveyors, belt conveyors, bucket elevators and belt loop and tube belt conveyors. These ensure that

the wood chips can be transported safely and efficiently from one point to another.

Transporting pellets is also no problem for Loibl. Here, it uses screw conveyors, trough chain conveyors and flat belt conveyors, among other things. These enable reliable and gentle transportation of the pellets to their destination.

In addition to its conveyor systems, Loibl also offers silos, loading and unloading systems and associated components. It attaches great importance to economical and environmentally friendly solutions in order to optimize the transport process.

Loibl also offers ash removal systems using pneumatic conveying technology for biomass and other substitute fuels. These systems enable effective removal of ash and pollutants from the biomass to ensure clean combustion.

TECHNOLOGIES FOR BIOMASS PLANTS

- ❖ LASHBELTCON®: belt conveyors;
- ❖ LASHCHAINCON®: trough chain conveyors;
- ❖ LASHSCREWCON®: screw conveyors;
- ❖ screw reclaimers;
- ❖ pan conveyors;
- ❖ pneumatic conveying systems
- ❖ slag conveyors and ash conveyors
- ❖ LASHBUCKETCON®: bucket elevators (belt/chain);
- ❖ LASHFLEXCON®: side wall conveyor;
- ❖ LASHPIPECON®: pipe conveyor;
- ❖ LASHLOOPCON®: closed loop conveyor;
- ❖ live bottoms for storage discharge;
- ❖ rotary feeders;
- ❖ hoppers;
- ❖ silos;
- ❖ components; and
- ❖ special solutions.

CASE STUDY: FOSSIL-FIRED POWER PLANT WITH BIOMASS FIRING

TRANSPORT UNITS FOR ASHES AND FGD GYPSUM TRANSPORT

- ❖ **Installation location:** Eemshaven, Netherlands
- ❖ **Fuel:** hard coal and biomass;
- ❖ **Power plant output:** 1,560MW;
- ❖ **Conversion year:** 2006 to 2015;
- ❖ **Modules:** complete combustion chamber ash disposal system, various reversible and movable belt conveyors, components, semi-portable scrapers, loading silos, ship loaders, electrics; and
- ❖ **Special features:** design, calculation, construction, manufacture, assembly in the company's own facilities, tests,





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commissioning, complete documentation, training of operating personnel, trial operation, combustion chamber ash disposal.

Loibl supplied and installed a complete transport line for RWE's hard coal power plant (2 x 780 MW) in Eemshaven, North Holland. These transport units transport the FGD gypsum from the flue gas desulphurization system and the fly ash from the filter.

The scope of delivery and services included the design, calculation, construction, manufacture, assembly in the workshops, tests, delivery, transport free to the point of use, unloading, complete assembly, commissioning, complete documentation and training of the operating personnel, the trial operation and the implementation of the evidence of the assurances of the furnace ash disposal

system and system components to be delivered.

The transport system from the gypsum preparation (after filter belt presses) to the gypsum warehouse is designed for a conveying capacity of 100tph (tonnes per hour), and for the transport from the

gypsum warehouse to ship loading of 400tph.

All belt conveyors are set up in closed belt bridges and are easily accessible. Safety devices such as belt misalignment monitors, speed monitors and pull rope switches monitor the correct function.

The gypsum is temporarily stored in a warehouse; both storage and retrieval are carried out using a semi-portable scraper installed in the warehouse.

LOIBL'S SCOPE OF SUPPLY AND SERVICES

- ❖ Various belt conveyors, some of which are reversible and movable, with the necessary transfer chutes and monitoring units;
- ❖ one semi-portable scraper for temporary storage of the plaster in a warehouse;
- ❖ one loading silo for one truck loading;
- ❖ one shiploader for loading onto ships; and
- ❖ complete cabling of all electrical consumers and devices.

DCi



Blow-by-blow account

of successful pneumatic handling projects



Collaboration leads to success at Ozinga's new terminal

PNEUMATIC CONVEYING IS KEY

Ozinga is a fifth-generation family business that has been supplying the construction industry throughout Illinois, Indiana, Wisconsin, Michigan and South Florida for almost a century. What started as a small coal yard has grown into a premier supplier of concrete and materials solutions. As business has grown, the company needed a terminal in the Port of Palm Beach to support its concrete business. This was a challenging location. The site is in a tourist area subject to high interest from local government with considerable desire to

maintain a pleasing aesthetic. It was also a complex project because Ozinga wanted to utilize a mechanical ship-unloader with a pneumatic conveying system — the first time, to the team's knowledge, a solution quite like this had been attempted worldwide. Thankfully, Ozinga had already assembled the perfect team to pull it off following a successful first project in Chicago with Dome Technology and FLSmidth Cement.

PNEUMATIC CONVEYING

"This project was similar to the Chicago project in terms of capacity, but the challenges were new," explains Mark Jackson of Ozinga. "The dome was going to be the same size, with the same

Ful-Floor™ reclaim system, but the terminal position was very different. It's a much more public setting, for one thing, so we had to go through a long design process to ensure we could get the permit for the build from the city, but we also wanted to connect a pneumatic transport system to the Siwertell mechanical ship-unloader, which was a challenge. To our knowledge, this had never been done before. Having worked so well with Dome Technology and FLSmidth Cement on the Chicago South Side project, we were confident we could make a success of this project too."

The desire for a pleasing aesthetic meant that Ozinga and Dome Technology had to work closely with the Port of Palm Beach and city officials to achieve an

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approved silo design. That meant hiding the mechanical fixtures behind a parapet wall on top of the dome, giving the silo a cylindrical appearance.

“We’ve never done anything quite this architecturally sophisticated for an industrial project,” says Dome Technology CEO Bradley Bateman. “It’s a one-of-a-kind project. In order to attach a parapet wall on top of the dome to hide the mechanical equipment, we needed a vertical edge to attach it to. We developed a low-profile dome concept, which includes a structural steel ring at the top of the dome to constrain the geometry between the top of the dome and the parapet wall — effectively a screen to improve the appearance of the dome. We’ve used this design on smaller applications in the past but never on an industrial scale. It took several design iterations to get the profile just right to obtain the needed tonnage of storage while ensuring the height of the parapet wall was sufficient to prevent anyone seeing the mechanical equipment on top. We created a 3D model of the project and checked the line of sight from several different points on the ground to be sure we’d got it right. In the end we settled on an 18ft-high aluminum parapet wall. The roof of the DomeSilo is constructed from a





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second piece of fabric — the same airform material the vertical DomeSilo wall is made from — that attaches to the steel ring at the top of the first section of the dome.”

The parapet wall gives the dome the appearance of a cylinder and hides the mechanical equipment from view.

MAKING THE DOME

Having received the permit in December 2021, work began on site. The deep foundation contractor installed 500 auger cast piles 48ft deep to support the weight of the 50,000 metric tonne dome.

In traditional dome silos, the PVC airform is bolted to the ring beam before being inflated with large fans. With this project, because of the pre-attached additional steel ring at the top of the silo wall, cranes were required to stabilize the dome as it inflated. Once inflation was complete — which took about three to four hours — work could begin inside the dome, with concrete and reinforcing steel rebar applied to the inside of the fabric until the required thickness was reached. The PVC airform remains in place, becoming the outer waterproofing membrane — and for this project, the surface on which the decorative finish was placed. “The dome took about a year and a half to build, from permitting to commissioning. We’re very

proud of the end result, and of the teamwork that got us there,” says Jackson.

CONNECTING WITH THE SIWERTELL

One of the most challenging parts of the project was integrating a new pneumatic transport system with the Siwertell ship-unloader. With cleanliness a priority, Ozinga wanted to convey product from the ship to the dome fully pneumatically, which meant figuring out a way to connect the FLSmidth Cement ‘N’ Pump with the Siwertell ship-unloader.

“The Siwertell ship-unloader is a mechanical conveying system,” explains Jason Heiser, head of sales and support for FLSmidth Cement’s Pneumatic Transport Line. “But Ozinga wanted to use a pneumatic conveying system to reduce dust and keep a cleaner environment. It was a real collaboration between our team, Siwertell, Ozinga and Dome Technology, to create a solution that worked for everyone.”

That solution was a Fuller-Kinyon® (FK) 350 ‘N’ Pump with three 500 hp Ful-Vane™ Compressors, the Ful-Lube™ lubrication systems and cooling systems. This was all designed to fit into a purpose-built building that was designed, then constructed under the highway bridge on site before it was moved into place under the Siwertell.

“This is a big building,” said Jackson. “It’s

about 40ft by 100ft and it weighs over 100 tonnes. We used heavy hydraulic moving equipment to lift it up and drive it to the port where the Siwertell was positioned to receive the building. The building is connected to the Siwertell in four locations, and everything fit perfectly.”

MOVING THE COMPRESSOR ROOM

Electric power is distributed via the Siwertell into the pump and compressors, generating sufficient energy to achieve discharge rate of 600tph (metric tonnes per hour). The convey pipe then travels 1,700ft underground before entering the DomeSilo.

“This was a real feat of engineering,” says Bateman. “We needed to unload the ship at a certain rate but there was no existing way to connect the mechanical system with the pneumatic transport. So all of us — Ozinga, FLSmidth Cement, Siwertell and Dome Technology — worked together to bring the technology into a solution that worked for this project. It unloads mechanically; it transports pneumatically. We think it’s the only one of its kind in the world.”

99% RECLAIM AND FULL REDUNDANCY

“This is our third dome across the company. In our first project we used a

different reclaim system, which has turned out to be very maintenance heavy. So when we were building the dome in Chicago — and again in the Port of Palm Beach — we knew we wanted something with more redundancy built in,” says Jackson. “The Ful-Floor fits the bill. The double dihedral crown in the middle, aeration system and twin outlets enable us to keep mechanical moving parts and people out of the dome.”

The Ful-Floor aerates different segments of the floor at controlled intervals, facilitating a balanced, even flow at the discharge points on the side of the DomeSilo. The importance of the twin outlets is really felt if one of the FK Pump transport systems outside of the DomeSilo is off-line. Discharge can continue from the other outlet while repair work is carried out, with no lost time.

The Ful-Floor™ reclaim system uses advanced fluidization technology to move materials smoothly and efficiently. Air is pushed through the Airslide® fabric, enabling material to flow like water, and the gentle slope directs the flow of material to the dual exits.

AESTHETICS AND WEATHER-PROOFING

“This terminal had to be all things to all people,” said Jackson. “A good amount of storage for us, with maximum reclaim for minimal effort. Clean, so we didn’t upset the local community or the environment with dust emissions. But it also had to stand up to the elements — of which coastal Florida has plenty — and to the discerning eye of the city officials. I’m happy to say we knocked it out of the park on all counts.”

- ❖ The dome is rated for 175mph winds, and during the construction phase stood up to a couple of severe weather events with no difficulties.
- ❖ The finished appearance of the dome has won the approval of the city officials and the local community alike, with plenty of positive press for the beautiful ocean-themed design.
- ❖ The fluidized floor continues to work well at both the Chicago and Palm Beach terminals. The Port of Palm Beach dome is now in daily operation.

“The Florida coast is not an easy place to build,” says Jackson, “but we worked hard and we worked well with our partners and with the city officials and the Port of Palm Beach to make this a success. We’re all really proud of the results.”

“Ozinga is a very sophisticated group. They drove this project and were instrumental in developing the overall technical solution,” says Bateman. “We all like to solve a problem, and this project presented plenty of challenges. It’s a testament to Ozinga’s innovative spirit that they were happy to take on so many firsts at the Port of Palm Beach, and we were proud to work alongside them for that.”

“Let’s be honest, the challenging projects are often the most interesting ones,” said Jason South, Vice President of Engineering for Dome Technology. “I’d go so far as to say they’re the fun ones; particularly when you’ve got a great team of people working to solve those challenges together. It’s a real thrill to look at that terminal now and know we played a key part in bringing it to fruition.”



Invicta's next step in delivering low carbon cement alternatives

The arrival in April of the Van Aalst pneumatic ship-unloader at Invicta's Sheerness terminal in Kent, UK, marks the latest development in building-out Invicta's deep-water cementitious powder facility.

Weighing in at 230 tonnes and with a working capacity of over 400 tonnes/hour, the unit will deliver cost-effective, reliable and dust-free unloading of 40,000 tonne bulk cargos, and the capability to bring to market cementitious materials from around the world.

Invicta is currently importing Pulverized Fly Ash (PFA), which offers a lower CO₂ footprint than traditional cement (CEM1). It can now offer a fuller range of alternative cementitious materials — that are increasingly scarce in the UK — from its terminal at Sheerness.

Daniel Morgan, Managing Director of Invicta says "This new unloader enables Invicta to source scarce, quality materials wherever they exist, and cost-effectively transport them to the UK in bulk vessels. We can now offer increasingly innovative choices to our customers, and for clients and specifiers, as they seek cementitious solutions to reduce CO₂ in concrete."

Chris Chapman, Brett Group Commercial Director and Invicta Board member says, "This represents the next step in our significant investment to be the source of choice for more sustainable cementitious solutions. It is part of our



commitment to be an innovative, independent and totally reliable, long-term supplier to the industry."

Invicta's new terminal at Sheerness became operational and started supplying PFA and high-quality CEM1 to the South East in 2024. It represents a £30m investment by a joint venture between the Brett Group, the UK's largest independent building materials company, and Nova Cement, the UK subsidiary of Medcem, which is a long-established and respected part of the global energy company, the Eren Group.

THE VAN AALST UNLOADER

Van Aalst has been on the forefront of pneumatic bulk handling equipment development since its inception. The innovative design and durability of the products have become the standard in the industry and Van Aalst Bulk Handling ship-unloaders are a hallmark for reliable and dust-free ship-unloading, from start to finish.

The unloader was shipped to Invicta Cementitious Solutions in Sheerness in the UK, on Hapo International Barges' crane barge Missing Link, towed by the tug *Barney* from the Herman Senior bv fleet



Cement & clinker handling systems

going from strength to strength

Images 1 & 2: CC934 loading clinker in Malaga Port, Spain, at a maximum capacity of 1,000tph. This system, with 1100-sized cones, is suspended from a mobile style shiploader supplied by Chia.



Louise Dodds-Ely

Minimizing product degradation and dust with Cleveland Cascade systems

Cleveland Cascades Ltd located in Thornaby, UK, has operated since 1992 and has developed the Cascade Chute System for over three decades. At present Cleveland Cascades has over 700 operational systems working in bulk handling worldwide.

The cascade chute is a specialist loading system designed to control the flow of bulk materials in mass flow, this is a single stream of material moving high 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.

It is understood throughout the bulk handling industry that cement-based

materials can be challenging to handle and have the potential to create large amounts of dust during loading.

The cascade system is designed to control, limit and contain the dust created whilst loading bulk materials. The Cleveland Cascades systems are also designed to protect product quality by minimizing product degradation through the promotion of mass material flow as described above.

Cleveland Cascades has supplied over 60 systems dedicated for loading either cement or clinker or both. The majority of these have been supplied across Europe with the remainder spanning across Africa, Asia, North America and South America.

One of Cleveland Cascades' more recent projects supplied with the primary objective of loading clinker was manufactured, installed and commissioned in 2019 for CHIA. The 1100 size system has a fully extended length of 20.5m and a fully retracted length of 5.7m, a locally mounted and is based in Malaga Port, Spain.

Cleveland Cascades has also supplied systems for loading cement and clinker products for customers such as Bedeschi Spa, FAM, Irish Cement, Tenova, Koch and Samson among many others.

Cleveland Cascades has supplied Systems for loading cement and clinker for

Image 3: CC928 is specified for loading clinker and is installed in the Asturias region of Spain. The system has a fully extended length of 20 metres with a retracted height of 5.25 metres.

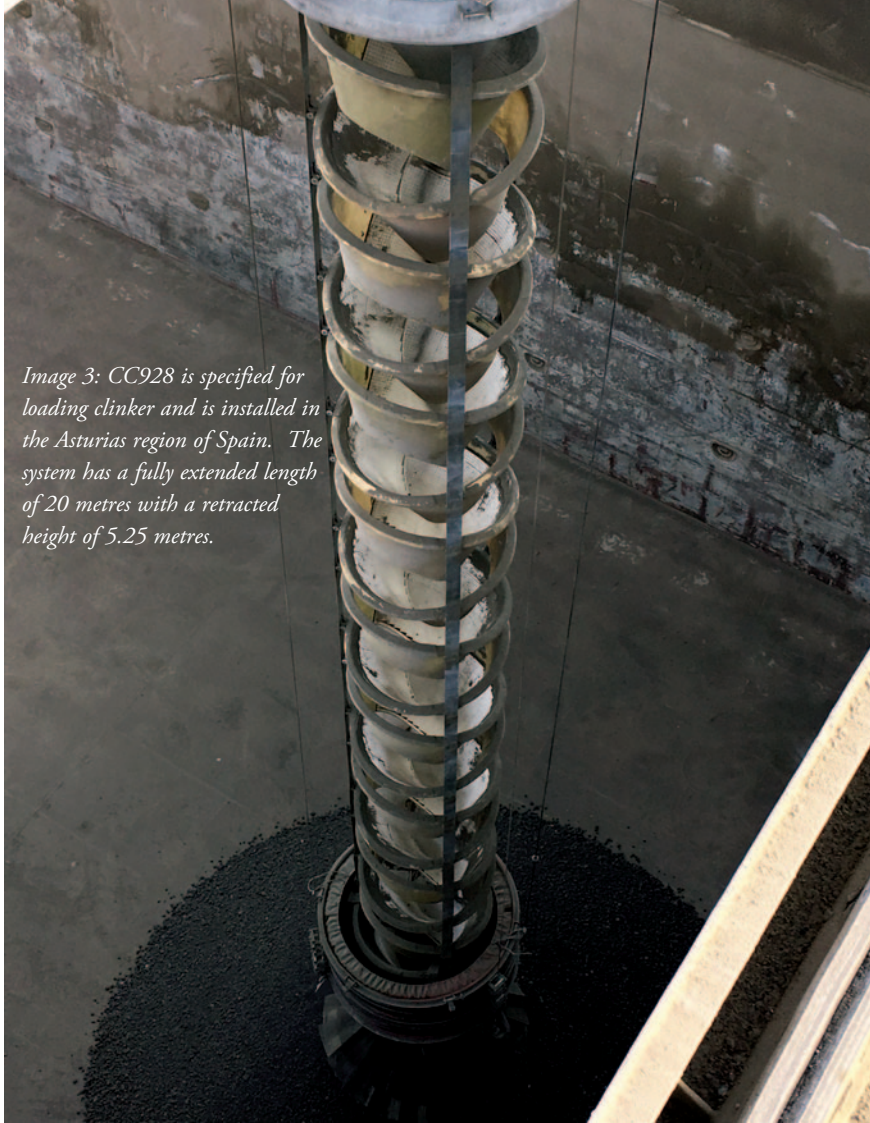


Image 4: CC928 is specified for loading clinker and is installed in the Asturias region of Spain. The system has a fully extended length of 20 metres with a retracted height of 5.25 metres.



applications requiring loading capacities of 270m³ per hour up to 1,400m³ per hour for loading via shiploaders, vehicle, rail and tanker loaders as well as silo loading.

These systems have been supplied in many lengths from 5m up to 35m in length.

EXAMPLES OF CLEVELAND CASCADES SYSTEMS LOADING CEMENT & CLINKER

CC934 loading clinker in Malaga Port, Spain. This system is suspended from a mobile style shiploader supplied by Chia. The chute is 20.5 metres long with a retracted height of 5.7 metres.

The system loads through Cleveland Cascades Ltd 1100 sized cones at 650tph (metric tonnes per hour) with a maximum capacity of 1,000m³ per hour.

CC928 is specified for loading clinker and is installed in the Asturias region of Spain. The system has a fully extended length of 20 metres with a retracted height of 5.25 metres.

The 1100 sized cones in this system allow a maximum volumetric loading rate of 1000 cubic metres per hour. Taking into account the density of the material loaded being 1.4–1.5 tonnes per cubic metre, a maximum material throughput of 1,500tph can be achieved which easily surpasses the



Image 5: smooth, dust-controlled loading.

customers' requirements of 900–1,000tph. This allows for material surges which can occur during loading operations.

CC880 loading cement and clinker in Sonmez, Turkey. This system is suspended from a shiploader supplied by Bedeschi. The chute is 22.7 metres Long with a retracted height of 6.1 metres.

The system loads through Cleveland Cascades Ltd 1300 sized cones at 1,100tph with a maximum capacity of 1,400m³ per

hour.

This system is also supplied with a specialist skirt outlet designed for use when loading fine cement. This skirt is much longer and more rigid than the typical skirt outlet and allows for the skirt to be partially submerged within the material inside the vessel hatch allowing for the material to be loaded within its own pile, further reducing the creation of dust.

CC1006 is presently undergoing

manufacturing and will be supplied to load cement and clinker in Yesilovacik, Turkey. After success with a previous cement and clinker loading chute, the customer has selected another Cleveland Cascade Chute for this application.

The Cascade Chute will be designed to load cement and clinker at up to 1,400tph from a shiploader system with a luffing boom. The chute will feature a pivoting head chute to function with the luffing of

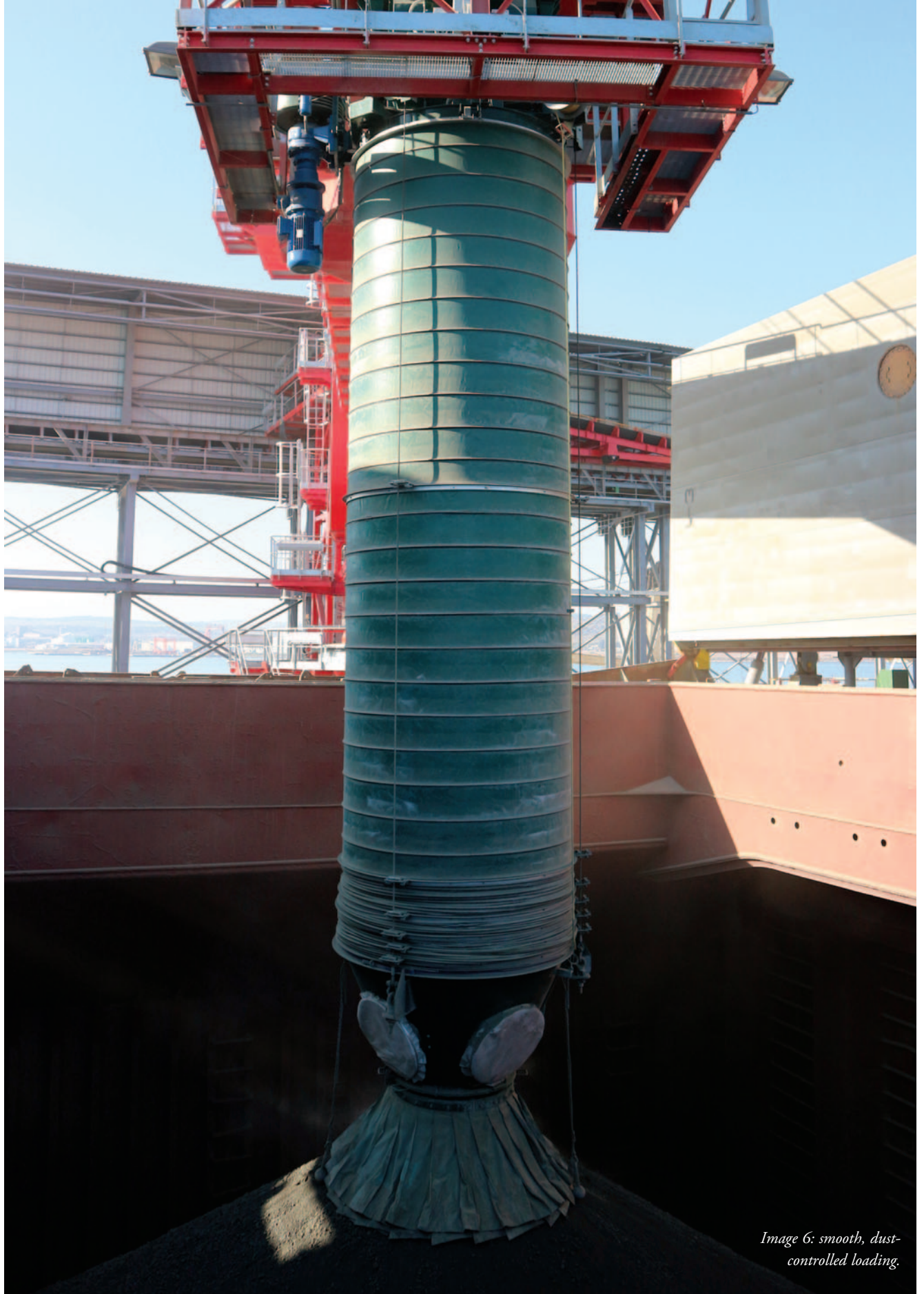


Image 6: smooth, dust-controlled loading.

the boom.

This will be a 1300 sized system with an extended length of 18 metres, capable of retracting to 3.5 metres for storage. The head chute will be lined with chromium carbide and the GRP cones lined with sintered alumina ceramic tiles for abrasion

protection.

The system will feature all the safety and automation functions such as, material detection and auto raise, downward motion limits, overload protection, position sensing and retraction limit switches all of which will feedback to the customer's PLC

for integration into the programming. The chute will be controlled by a locally mounted winch for downward motion and retraction.

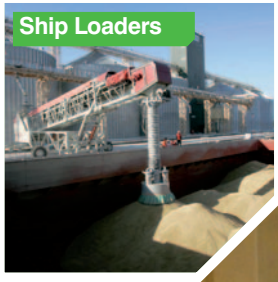
The chute outlet will be fitted with a skirt for creating a seal on the material pile keeping dust creation to a minimum.

Cleveland Cascades Ltd

Global leader in bespoke dry bulk loading chutes



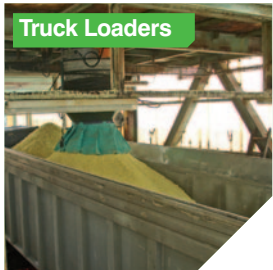
Ship Loaders



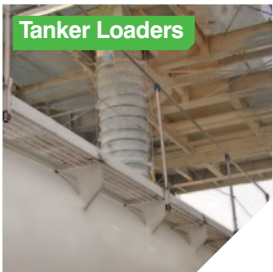
Silo Loaders



Truck Loaders



Tanker Loaders



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

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

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

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

Contact Cleveland Cascades Ltd

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

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



How Lion Bulk Handling helps overcome the challenges of cement transportation and storage



The importance of cement in modern construction cannot be overstated, but transportation and storage present significant challenges for manufacturers and distributors alike. Cement, in its raw form, is bulky, prone to degradation, and vulnerable to environmental factors. These challenges necessitate specialized logistics and infrastructure to ensure the efficient and safe delivery of cement to its destination.

As Lion Bulk Handling (part of Lion Marine Group), the company has great expertise in overcoming these challenges of dry bulk handling: by offering tailored services and solutions.

THE CHALLENGES OF CEMENT TRANSPORTATION AND STORAGE

1. BULK AND WEIGHT

Cement is often transported in large quantities, whether in bulk or in packaged form. Its heavy weight poses logistical difficulties, especially when transporting over long distances. Ships, trucks, and trains used for cement transportation need to be specially designed to handle these

loads, requiring robust infrastructure.

Lion Bulk Handling's brand — H.W.Carlsen — has been a supplier of self-unloading barges, bulk carriers and self-discharging cement carriers (SDCC) for decades. Hundreds of ships and barges

worldwide have been equipped with H.W.Carlsen loading and unloading systems. Lion Bulk Handling offers a range of configurations for loading and unloading self-discharging cement carriers, including airslide, screw conveyor, and pipeline





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loading systems, as well as double re-loaders, screw conveyors, and Lion Bulk Handling's highly energy-efficient E3-cargo unloading systems.

These state-of-the-art systems load and discharge cement quickly and safely, minimizing the need for manual handling, reducing the risk of material loss and with minimized energy consumption. With max vessel size to 40,000dwt and a maximum conveying capacity up to 1,500tph, these tailored transportation solutions ensure that cement is delivered in a safe and timely manner, regardless of the quantity.

2. DUST AND SPILLAGE

Cement powder, especially when transported or handled in bulk, can create significant dust. This not only poses environmental concerns but also complicates the loading and unloading process. Cement dust can settle on equipment, vehicles, and surrounding areas, leading to potential contamination or additional cleaning requirements. Furthermore, accidental spillage can cause financial losses, particularly if the spillage is extensive.

To minimize dust emissions and spillage during loading and unloading, the best technical solutions are implemented. All of Lion Bulk Handling's applications — including unloaders, loaders, self-discharging cement carriers, offshore vessels, and drilling rigs equipped with advanced bulk handling systems — are designed to minimize dust emissions and control cement handling to prevent spillage. These measures not only protect the environment but also help avoid potential fines related to environmental violations.



3. BULK STORAGE

The bulk nature of cement means that significant storage space is required, and additionally, the demand for cement in different regions can fluctuate. Over time, if cement is not properly stored or managed, it can degrade, leading to poor quality and potentially unsafe materials. Also, weather conditions like heavy rain, winds, or extreme temperatures can easily damage the product. Therefore, efficient storage solutions are a necessity to keep dry bulk operations moving.

When there is enough space on land, storage silos are the perfect solution to store bulk materials like cement. Lion Bulk Handling's steel bolted silos are constructed with protective linings, coatings, and the required certification, with a custom design regarding the local constraints related to the site (snow, wind,

seismic data, etc.) and daily consumption. With a maximum silo size of 5,000dwt, Lion Bulk Handling offers new build projects, scaled up or down, depending on the project size.

A floating terminal can be used as a temporary facility for a large construction project, or a permanent facility for terminals with insufficient space on land. One of the unique characteristics of a floating terminal is the capability to be stationed up to 200 metres offshore and pumping the cement or fly ash to shore via a floating pipeline.

Therefore, the terminal does not need any dock. Another characteristic of a floating terminal is to act as extra storage for loading ships, bagging plants or even bulk trucks on the dock.

Lion Bulk Handling designs multiple configurations for loading and unloading via floating terminals. These systems are adapted to, by example, shallow rivers and estuaries and can be used for both open top and closed top ships, bringing weather delays to a minimum.

MOVING FORWARD WITH LION BULK HANDLING

By addressing the unique logistical needs of cement transportation and storage, Lion Bulk Handling has solidified its position as a leader in the industry. With its three divisions, Lion Bulk Handling, Lion Technology and Lion Engineering, the group can provide answers to all bulk handling challenges, with reliable, efficient, and sustainable solutions.

It can do so not only with its applications, but also with on-site services, spare parts, advisory, practical training, bulk testing and feasibility studies.



EFFICIENT **OFFSHORE ROCK** SHIPLOADING



FIND OUT **MORE**



Telestack was commissioned by DEME Group, a leading marine engineering and offshore energy company, to design, build, and install a material handling system. This included 2 x AP 1500 D3 wheel-mounted apron feeders and 2 x TB 52 (170ft) radial telescopic shiploaders. The system is used to load **10-60 (500mm - 20") offshore rock material** onto a Flexible Fall Pipe Vessel (FFPV). Its radial and telescopic design allows precise placement of material, reducing the need for excavator work onboard and increasing overall loading efficiency and tonnage rate.



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Retrofit of cement conveyor with high-performance rollers from Rulmeca



CHALLENGE

The Oman Cement Company (OCC) SAOG, Muscat, Oman, had to upgrade the performance of its 30-year-old conveyor, which transports hot cement powder from the cement mill to the silo, from 150tph (tonnes per hour) to 250tph.

The implementation of this 66% increase in capacity via a retrofit of the existing conveyor (with a horizontal length of 255m and a vertical stroke of almost 44m) was enabled with the use of high-performance rollers from Rulmeca. The challenge was to increase throughput via a retrofit at minimum investment cost.



SOLUTION

For such large conveyors such as OCC's Rulmeca provided a very wide variety of components which are precisely matched to the particular conveying task. PSV1 series rollers (20F, 108N, 323) with a pitch of 1.3 m are used on the carrying side. In detail, the following components from Rulmeca's bulk material transportation belt roller range in the design of the OCC conveyor were used:

- ❖ PSV2 series rollers (25F, 108N, 958) with a 3m pitch are used on the return side. Both product series are specially designed for heavy-duty continuous operation under high workloads and are characterized by smooth running and minimal maintenance requirements. The rollers of the PSV2 series are designed for higher loads.
- ❖ For better damping of the belt at the loading point, so-called loading rollers (PSV1,20F,63/108NA,323) have also been fitted. These shock-absorbing rollers are fitted with rings designed to absorb the impulse generated by the impact of the material on the belt.

- ❖ On the return side, tape guide rollers of model SG080-30-800-958 are now positioned at three strategic locations. They serve to correct possible belt skew in the return direction and are characterized by the fact that they can centre themselves.
- ❖ On the carrying side, self-centralizing troughing sets with a braking effect (P3SF/70 F14 108 HI55) were also applied every 25m: in the event that the belt is misaligned, the self-centralizing rotation of the troughing sets guides the belt back to the centre. In addition to these moving parts, Synergy International FZE has also used Rulmeca conveyor roller accessories, thus ensuring the provision of virtually all components from a single source.
- ❖ A3PI series transoms (5A-F14-108 HI55 Z) are used for smooth belt transition from 10° to 20° and from 30° to 35° of trough angle.
- ❖ SPT series supports (1478 H70 Z) are used on the return side.
- ❖ A primary cleaner (HM-800) and a secondary cleaner (P-800) achieve almost 100% cleaning efficiency at the conveyor's head. A plough cleaner (VLP-800) is also used for rear cleaning. Rulmeca also provided corresponding CAD data for its entire range. This allowed the OEM Synergy International FZE to provide OCC



with a complete package in which all components in use were comprehensively co-ordinated with each other.

BENEFITS

Rulmeca's high-performance idlers are crucial for reliable long-term operation of such large conveyors with increased throughput. Compared to simple rollers of inferior quality, they run much more

smoothly, and this reduces thermal stress. In addition, they also contribute significantly to lowering overall ownership costs. This is because they have a much longer service life than simple lower-quality rollers, and they also ensure the high reliability of the entire system due to their lower failure rate.

These quality products are manufactured from precision-turned components. Of particular note, hardened steels and other alloys ensure that the conveyor belt rollers function optimally over a long period of time and under the toughest conditions. Various protective measures for the bearings and minimal concentricity tolerances are paramount for the longevity of the bulk material conveyor rollers. Rulmeca achieves maximum precision by balancing each individual roller. It is understandable that this has its price. This investment in quality is all the more worthwhile given the higher speed and greater length of the belt.



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Seamless packaging means elevated branding



Partnering with a manufacturer that can manage the entire supply chain — from bag testing to supply — ensures a smooth and hassle-free experience.

When it comes to product packaging, every element — from design and materials to compatibility with machinery and product — plays a vital role in achieving both efficient function and a positive brand image, writes *Marta Bortolotti, Division Manager Consumables at HAVER & BOECKER oHG*. Cement producers rely on their packaging to keep their product dust-free and uncontaminated throughout the packing, delivery and storage process. Not all packaging can meet these needs, especially when operating in high-demand environments where efficiency and durability are critical.

To maintain a competitive edge, producers must carefully evaluate their packaging choices, ensuring they align with operational goals, cost efficiency and sustainability requirements.

PARTNER WITH AN EXPERT

Unlike providers who specialize solely in packaging, full-service manufacturers can combine their expertise in packing equipment, product analysis and bag testing. For cement producers, this means ensuring bags are designed to withstand the weight, pressure and dust-control requirements of high-speed filling operations. By working with an expert, companies can address challenges such as optimizing bag

permeability, enhancing moisture resistance, and ensuring valve functionality. Packing equipment manufacturers can provide bag recommendations that integrate seamlessly with their machinery. This approach enhances efficiency, expedites the filling process and ensures operational flow — all while saving resources, preserving product and strengthening brand perception.

Cement packaging requires robust materials and precise valve characteristics to prevent product loss and ensure a clean packing environment by eliminating leaks, poor sealing or inefficiencies in bag performance. By leveraging detailed testing processes — such as bag volume checks and valve inspections — some

manufacturers ensure the bag material and design are tailored to each packing line and product.

This level of precision is particularly important in cement and powdered material production, where even minor inefficiencies can lead to significant operational disruptions and material waste.

ANALYSE YOUR OPERATIONAL NEEDS

Some manufacturers use a full-service approach to align bags, equipment and products into a cohesive system. By aligning all three pillars, they can create solutions that reduce waste, save resources, improve operational efficiency and maximize output to achieve the perfect flow. A holistic approach to packing directly improves cost-



More than just a functional component, a bag serves as a powerful branding tool and a visual business card for each company.

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Full-service manufacturers can combine their expertise in packing equipment and product analysis. They can provide bag recommendations that integrate seamlessly with machinery.



effectiveness and regulatory compliance.

To begin, an expert will analyse the cement formulation. This includes assessing dust control needs and bag-filling dynamics, ensuring the filling spout is properly fitted to the valve bag to prevent product loss while optimizing aeration for faster, more efficient filling. This analysis helps to define the ideal machine technology and design a packaging solution that fits seamlessly into the operation's preexisting process.

This comprehensive approach ensures each packing facility can tackle even the most challenging requirements with precision and efficiency. Whether an operation is switching from open-mouth to valve-bag equipment or looking for ways to resolve inefficiencies with its current packing line, analysing bags should be a part of the equation.

TEST AND FINE-TUNE THE PRODUCTION LINE

After determining the cement formula, an engineer provides consultation and testing to gain a full understanding of the facility's packing systems and how they interact with the product. The manufacturer's engineers then create a custom bag report and fine-tune designs. Look for a manufacturer that can manage the entire supply chain — from bag testing to supply — ensuring a smooth and hassle-free experience.

Some manufacturers also provide bag optimization plans focused solely on the performance of existing bags to ensure they align with the demands of the cement production line. Through analysis, these manufacturers identify areas for improvement, offering specific recommendations to enhance bag materials, structure and compatibility. For example, if excessive

dust production is identified, adjustments in bag permeability or valve design may significantly improve containment. This method not only increases productivity and efficiency but also ensures cost-effectiveness by minimizing downtime, reducing waste and optimizing resource use.

One cement producer recently partnered with a packing manufacturer to optimize its bagging process. Facing challenges such as product loss in the form of dust during the filling process and inefficient valve performance, the producer underwent a comprehensive bag analysis. By refining the bag structure and improving valve alignment, the facility reduced product waste by 14% and increased filling speed by 12%.

A BAG THAT REFLECTS THE BRAND

More than just a functional component, a bag serves as a powerful branding tool and a visual business card for each company. For cement manufacturers, durable, well-sealed bags not only protect the product but also enhance the company's reputation for quality and reliability. While some companies work with multiple providers for packaging, partnering with a single OEM expert — who understands the product, equipment and production goals — provides unbeatable efficiency and peace of mind. This not only simplifies procurement but also ensures consistency in quality and performance across all production batches.

With an integrated approach, every bag becomes a powerful asset for the brand and business. Additionally, sustainable packaging solutions, such as recyclable materials or lightweight designs, are becoming a growing focus in the industry.

Cement producers that invest in both functional and environmentally responsible packaging will not only improve efficiency but also position themselves as industry leaders in innovation.

ABOUT HAVER & BOECKER

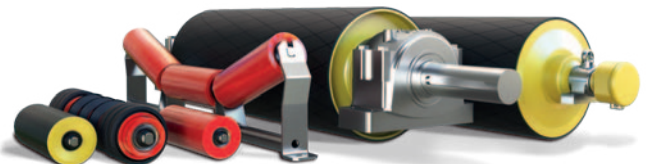
HAVER & BOECKER is a family-managed, midsize company with headquarters in Oelde, Westphalia, Germany. HAVER & BOECKER OHG is comprised of the Wire Weaving and Machinery Divisions. Together with more than 50 subsidiaries and 150 representatives on five continents, HAVER & BOECKER operates worldwide with about 3,000 employees.

The Wire Weaving Division manufactures woven wire cloth and processes it into engineered woven wire products. These are used for screening and filtration in the chemical, plastics and automobile industries, in aviation and aerospace, electronics, industrial and analysis screening, in the food industry as well as for architectural applications.

The Machinery Division and its technology brands HAVER & BOECKER, HAVER & BOECKER NIAGARA, IBAU HAMBURG, SOMMER, FEIGE FILLING, BEHN + BATES, AVENTUS, NEWTEC BAG PALLETIZING, HAVER Engineering, NEXOPART, AML and The Portland Company specialize in processing, transport, storage, mixing, filling, packing, palletizing and loading of bulk materials. The product range includes individual machines and complete systems for handling bulk goods, liquid and pasty products, food and pet food, as well as ship loaders and unloaders. QUAT²RO networks the individual process steps for a transparent and efficient process.



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MOVING AHEAD

Horizontal screw conveyors ensure efficient cement transfers

A newly built cement terminal in Sacramento, California, USA, needed an efficient, high-capacity conveying system that could transfer dry bulk material either to silos or to trucks for onward transport; Siwertell horizontal screw conveyors proved to be ideal for the task.

Customer need: in addition to a ship-unloader, global building materials company, Cemex, needed a conveying system for its new cement terminal in Sacramento, California. It was built as part of the company's substantial US network of facilities, including ten cement plants, close to 50 strategically located cement terminals, around 50 aggregate quarries, and more than 280 ready-mix concrete plants.

The terminal's new conveyor system needed to transfer cement from the ship-unloader and moveable transfer trolley to the storage facility, and also ensure efficient material flows around the terminal. This included transporting cement to silos or to truck loading facilities. The company has a more than 100-year legacy of handling cement and has high expectations of any technology that it adopts.

The solution: Bruks Siwertell was awarded the contract to not only supply the Siwertell ST 490-D ship-unloader, with a side-tilting arm system, but also the terminal's material conveying systems. The operator specified Siwertell horizontal screw conveyors including type-HSC-800 jetty screw conveyors, type-HSC 630 rail car discharge conveyors, and type-HSC 630 transfer conveyors.

In total, the Sacramento facility is served by two horizontal screw conveyors, which transfer cement from the ship-unloader to the silo area, and four horizontal screw conveyors that handle the cement in the terminal. Together they offer the facility exactly what it needed; high-capacity,



reliable performance.

On the jetty, the horizontal screw conveyors are covered with a belt to protect the environment and minimize any fugitive dust emissions. They have a

modular construction and have been installed in a series, which offers a consistent conveying profile over long distances. Horizontal screw conveyors have a reversible conveying direction and can be used for inclined conveying.

Siwertell screw conveyors offer particular advantages to dry bulk operators, and have been a central part in loading and unloading systems within terminals for decades. They are robust and hard-wearing, so for the construction industry, handling cement and more abrasive materials such as clinker and aggregates, screw conveyors offer very reliable, cost-efficient performance and minimal maintenance. They can also be totally enclosed to bring dust emissions down to negligible levels and ensure spillage-free material transfers at very high capacities.





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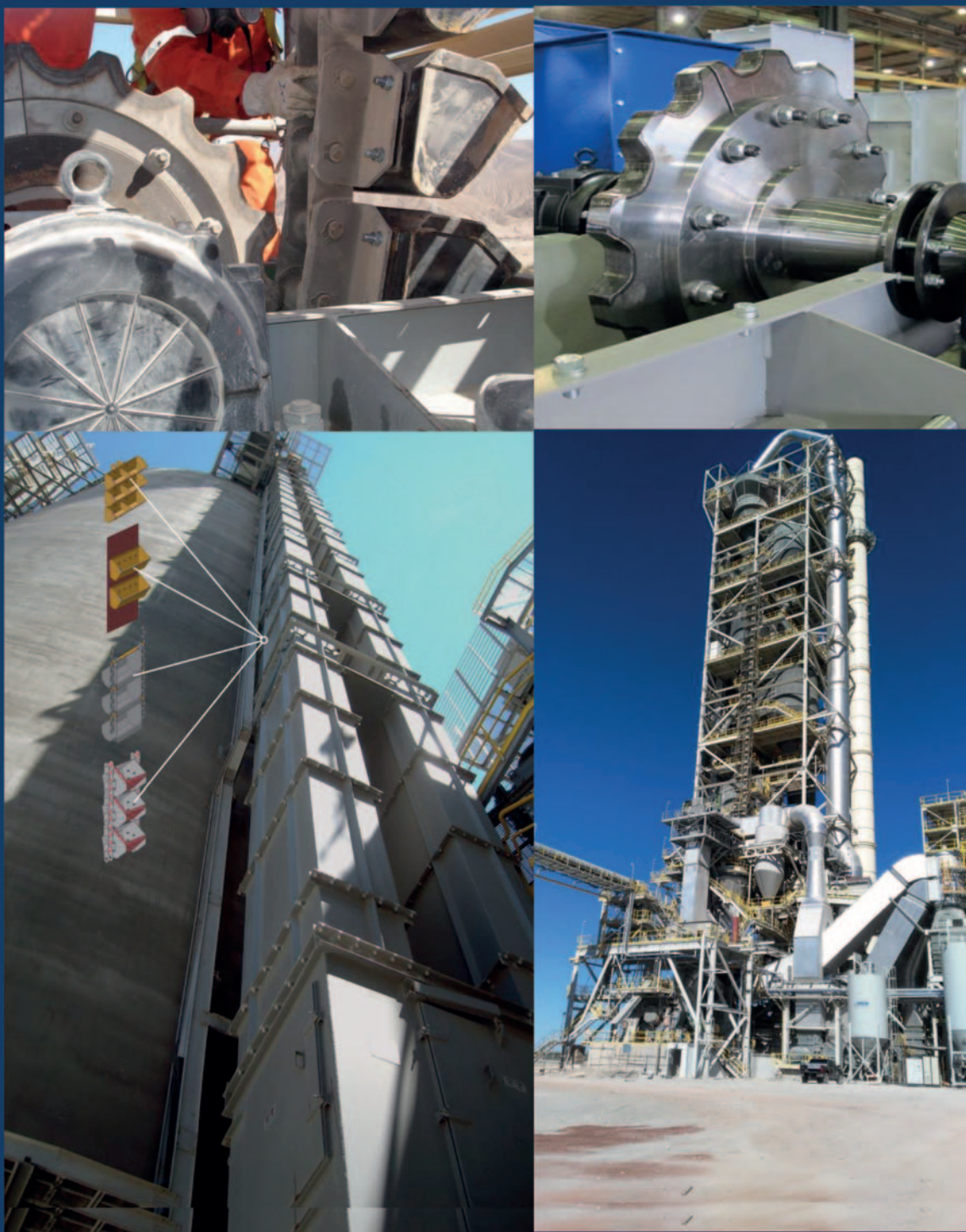


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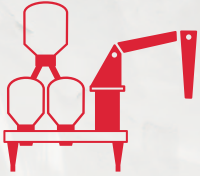


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Bruks Siwertell wins strategic shiploader order from Sky Logistics in Egypt

Bruks Siwertell has secured a new order for a Siwertell shiploader from Sky Ports, Egypt, part of the Sky Logistics Group. The shiploader will play a pivotal role in supporting Egypt's cement export industry, serving key markets in the Mediterranean, Africa, and beyond.

The screw-type Siwertell type-1B shiploader, with a rated capacity of 1,000 tonnes per hour, is destined for a new multipurpose terminal in East Port Said, which has been developed to grow the region's economy and align with its 'green' port ambitions.

"Siwertell technology is renowned for its excellent environmental protection credentials, and for its reliable, efficient operational performance," says Per Hansson, Operations Director, Bruks Siwertell. "The order marks a significant milestone in our growth strategy for the region, and underscores Bruks Siwertell's commitment to expanding its global presence, particularly within Africa, where we have one other shiploader scheduled for delivery in 2025.

"We are increasingly called upon to be part of large-scale, regional infrastructure projects, and have a reputation for



delivering quality, dynamic, tailored solutions that offer a competitive advantage against established suppliers," continues Hansson. "Our mobile solutions are also increasingly specified for cement and fly ash markets, indicating strong potential for future collaborations."

Sky Logistics chose Bruks Siwertell for its reputation. The Siwertell shiploader offers: fully enclosed, dust-free cement handling; low power consumption compared to alternative technologies; high rates of efficiency and fast vessel turnarounds; and a versatile screw-type conveyor system, which can operate at

various inclines and angles, enabling it to serve a range of bulk carrier types, including open hatch vessels of up to 60,000dwt in size.

The shiploader will be assembled onsite and is scheduled for delivery at the end of 2025. It will come equipped with a tripper arrangement that will be integrated into the operator's jetty conveyor gallery, and will also feature advanced digital technology, such as the Siwertell SmartView IIoT tool for enhanced operational monitoring and support. A comprehensive five-day training programme will also be delivered.

Growing Into Performance.

Full range of dry bulk solutions.

The Moduflex loading chutes are designed to grant high capacity, great performance, and long-term reliability. The Moduflex sturdy structure allows its installation in heavy duty environments, like ship loading, rail and road transport, and warehousing. Cimbria is a global leading manufacturer of conveying equipment, covering a wide range of dry bulk applications from agricultural products to industrial commodities, cement, fertilizers and other raw materials. Our broad experience ensures our clients receive the customized solutions they need to grow their business.



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Keeping cement moving: how Kinder's K Spiromax® roller turns carryback into productivity

If you walk through any cement plant, you will see fine grey dust everywhere. It finds its way onto floors, structures, and most expensively on the return side of conveyor belts. This “carryback” is more than a housekeeping headache. Left unchecked, it accelerates roller shell wear, drags on the belt, throws tracking out, and raises the risk of emergency stoppages that no production manager wants.

Kinder's K Spiromax® Cleaning and Tracking Roller tackles all those issues in a single, self contained unit. By replacing a standard return idler with one fitted with wear resistant polyurethane spirals, the roller scrapes off stubborn cement residues while guiding the belt back to centre. The result is a cleaner, safer and more energy efficient conveyor, achieved with almost no maintenance intervention.

WHY CEMENT NEEDS A DIFFERENT KIND OF CLEANER

Cement clinker and raw meal are notorious for their high calcium content and hygroscopic nature. Moist ambient air in a tunnel or transfer station quickly turns fine particles into a sticky paste. Traditional rubber or metal scrapers often lose effectiveness as this paste builds up. The polyurethane spirals on the K Spiromax® remain flexible enough to flick the material away rather than let it pack between the belt and roller. Polyurethane will not gouge or abrade the belt cover; service life is extended on both components.

DUAL ACTION: CLEANING AND TRACKING

Carryback and mistracking are two sides of the same problem. When wet cement cake gathers on one edge, the belt runs off line; the further it drifts, the more material it drops. The spiral geometry on the K Spiromax® applies a gentle, equalizing

force that brings the belt back to centre as soon as it begins to wander. Unlike flat rubber lagging, the helical pattern creates a slight axial movement that sheds dust continuously while nudging the belt into alignment. Operators therefore solve two chronic issues with one change out.

PLUG AND PLAY UPGRADE

Installing the K Spiromax® is as straightforward as swapping any return roller. The assembly is designed to drop into existing return brackets, including vee return frames commonly found under wide, heavily loaded cement belts. No special tensioning devices, water supply or pneumatics are required, so there is nothing to adjust afterwards. Once the roller is running, planned maintenance is effectively limited to periodic visual checks during standard walk throughs.

For plant engineers working with multiple belt widths — from clinker transfer to finished cement load out — Kinder supplies the same spiral concept in diameters to suit every application. The roller can be positioned over a discharge chute, collection hopper or anywhere along a long return strand until the point where product no longer adheres. This flexibility allows targeted placement where it delivers maximum value.

CONCRETE BENEFITS FOR CEMENT PRODUCERS

- ❖ **Reduced clean up hours:** independent case studies show significant reductions in manual shovelling around tail pulleys and return idlers after the K Spiromax® is fitted. One quarry reported a 75% drop-in labour hours previously spent hosing and scraping under a clinker conveyor.
- ❖ **Lower roller replacement costs:**

polyurethane spirals protect the steel shell from abrasive fines, meaning idlers last longer and maintenance budgets stretch further.

- ❖ **Energy savings:** a clean, centred belt runs with less drag. Even small reductions in absorbed power translate to noticeable kilowatt hour savings over a 24/7 cement operation.
- ❖ **Safety improvements:** eliminating spillage minimizes slip hazards and protects idler framework from material build up that can obstruct pull wire access. Fewer confined space or hot work permits are required because the roller is a dry, mechanical solution.

FIELD PROOF: FOUR YEARS AND COUNTING

A southern hemisphere quarry manager first adopted the K Spiromax® on a 1,200mm clinker conveyor notorious for wet season build up. Four years later the same rollers remain in service, providing “extra back up cleaning during periods of wet weather” and acting as standard idlers during drier months — no replacement spirals, no unexpected downtime.

SUSTAINABLE PRODUCTION, SIMPLER COMPLIANCE

Global cement producers face ever tighter environmental and workplace regulations. Dust emissions, housekeeping scores and energy intensity figures are scrutinized by investors and regulators alike. The K Spiromax® stops dust at the source and requires no water or chemicals, it helps plants hit sustainability targets while supporting ISO 45001 safety objectives.

A SMALL CHANGE WITH A BIG PAY OFF

In an industry where a single unplanned shutdown can cost tens of thousands of dollars per hour, preventative investments must deliver rapid returns. Swapping out a conventional return roller for a K Spiromax® typically takes less than one shift and pays back in continuous tonnes shipped rather than shovelled. For cement facilities looking to improve OEE without capital intensive overhauls, this low maintenance, dual function roller offers one of the quickest wins available on the market today.

With a single, robust component, Kinder's K Spiromax® helps cement producers keep product moving, employees safe and margins healthy.



Safeguarding the environment and workers remains priority for CAPOTEX

CAPOTEX has become a discreet yet essential driving force of change in 21st-century cement plants, particularly in the areas of environmental protection and workplace safety.

COVERED BELT CONVEYORS: THE SILENT REVOLUTION IN CEMENT PLANTS

Covering belt conveyors with enclosures is emerging as a key strategy in the cement industry to enhance operational efficiency, reduce maintenance costs, improve workplace safety, and mitigate the environmental impact of plants.

Belt conveyors are the lifelines of a cement plant: they transport tonnes of raw materials (limestone, clay), red-hot clinker, and powdered cement throughout the facility. Traditionally, many of these conveyors have operated outdoors, exposed to the elements. However, a quiet but decisive shift is taking place in the sector: the installation of covers over conveyor belts. Why? The benefits are numerous and tangible. Since 1996, CAPOTEX has installed more than 1,400km of covers in 75 countries and has witnessed a growing demand for these systems in the cement sector due to their technical, economic, and environmental advantages.

OPERATIONAL EFFICIENCY AND REDUCED MAINTENANCE

Enclosing the conveyor prevents material loss during transport: no more fine clouds of clinker or cement dust blowing away in the wind. Every kilogram of raw material reaches its destination instead of being dispersed along the way, reducing material losses during transport and ensuring full production capacity. Additionally, the cover acts as a shield against rain, sun, and wind. This protects equipment from premature

wear: rollers, motors, and the belt itself suffer less from dust abrasion, corrosion, or deformation caused by weather conditions. As a result, the conveyors require fewer cleanings and emergency shutdowns, and maintenance costs are significantly reduced. The system's lifespan is extended, delaying the need for replacement investments thanks to less wear and tear on the conveyor and its components.

WORKPLACE SAFETY: GOODBYE TO PREVENTABLE ACCIDENTS

In cement plants, worker safety is a top priority, and open conveyors have long posed serious risks. Exposed mechanisms present entrapment hazards: a loose garment or a moment of inattention near a pulley can lead to a serious accident.

Many cement plants that have adopted covers report a safer and cleaner work environment, where operators can perform their duties with reduced risk and better visibility (also due to the reduction in airborne dust). The trend has reached the point where several countries now legally require the use of covers on all belt conveyors.

A BREATH OF FRESH AIR FOR THE ENVIRONMENT (AND THE COMMUNITY)

The image of a cloud of cement dust rising from a plant is a thing of the past wherever the conveyors are covered. Encasing transported material drastically reduces dust emissions into the environment by containing particles within the system. This not only improves air quality inside the plant but also in nearby communities, benefiting public health and fostering better community relations. In a context where cement plants are facing increasing environmental scrutiny, belt conveyor covers have become allies in meeting

emission limits and reducing disturbances to the population.

PROFITABILITY AND COMPLIANCE: THE OTHER SIDE OF THE COIN

All the technical and environmental benefits ultimately translate into greater profitability for cement operations. A covered belt conveyor helps avoid fines for violating dust and noise emission regulations, acting as a safeguard amid growing regulatory pressure. Moreover, the reduction in workplace accidents avoids related costs (downtime, investigations, compensation) and boosts productivity by ensuring safer and more motivated workers on site.

The investment in covering belt conveyors pays for itself many times over through savings in cleaning, maintenance, and avoided material losses, while also improving safety and regulatory compliance.

FROM EXCEPTION TO INDUSTRY STANDARD IN CEMENT PLANTS

Gone are the days when seeing an uncovered belt conveyor was synonymous with 'how it's always been done'. Today, conveyors covered with enclosures are becoming the standard in cutting-edge cement plants. Major industrial technology providers now incorporate these systems into their plant designs, recognizing that a modern cement plant must be efficient and clean. In an increasingly efficiency- and environmentally-conscious cement industry, this 'silent revolution' of covered belts is helping plants become safer, more productive, and more sustainable than ever. In short, belt conveyor enclosures have evolved from being an optional add-on to becoming discreet yet essential protagonists of change in 21st-century cement manufacturing.



Martin® X-Stand improves air cannon efficiency and safety

A global expert in bulk material flow technology, Martin Engineering, has introduced a heavy-duty air cannon mounting system. The Martin® X-Stand is an organization system that safely keeps air cannons away from super-heated or potentially hazardous areas while offering easy service access. The result is clearer walkways, improved safety, and greater maintenance efficiency for a lower cost of operation.

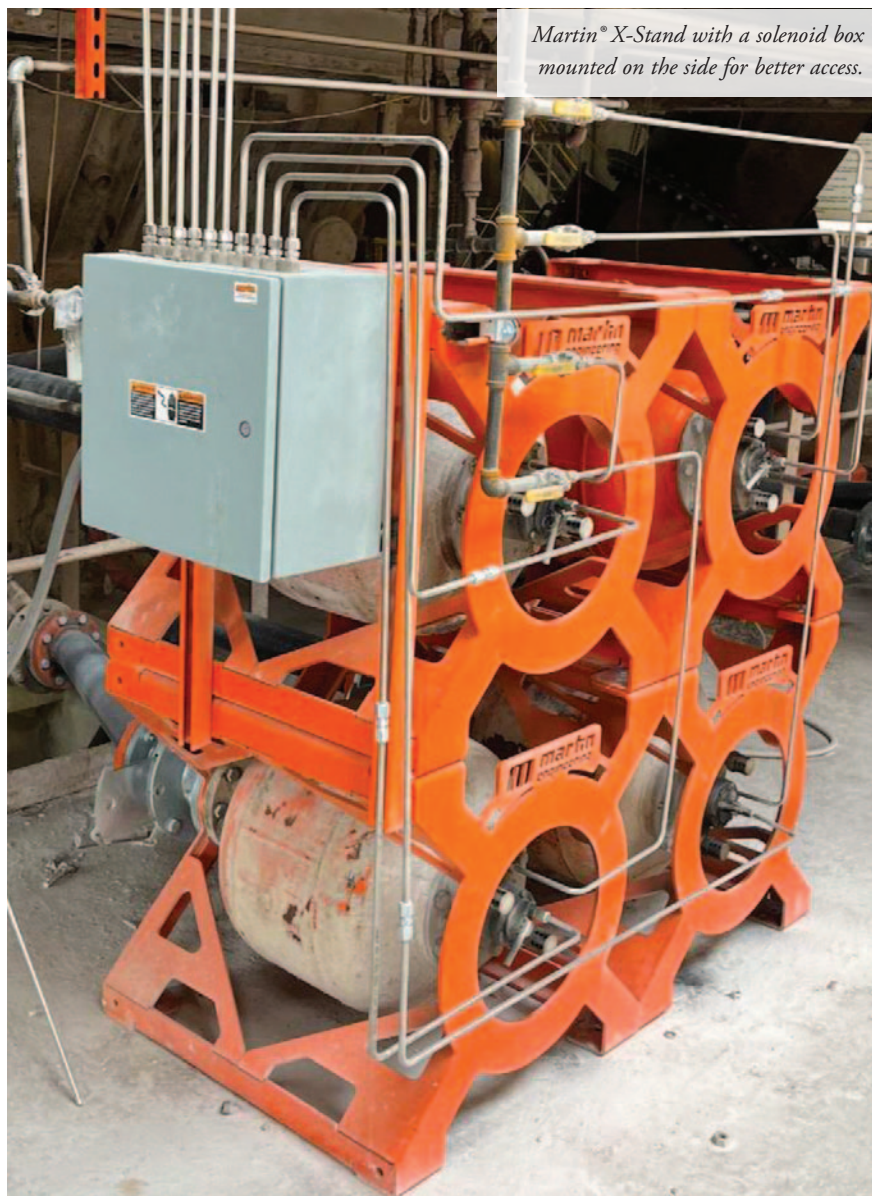
"Though secure when held in place by pipework, air cannons can be precariously placed around preheaters, hoppers, and drop chutes, making them hard to get around or reach by maintenance crews," said Sid Dev, Product Manager of Air Cannons at Martin Engineering. "Some of these applications can also be in high-heat environments in loading zones, so we worked with customers to formulate a more practical and long-term solution. The X-Stand ended up having more benefits than we initially thought!"

AIR CANNON X-STAND SPECS

The X-Stand is a rugged steel cube frame



Martin® X-Stand organizes air cannons and protects maintenance staff (all pictures © 2025 Martin Engineering).



Martin® X-Stand with a solenoid box mounted on the side for better access.

that comes in 3 sizes to fit the 35-litre, 70-litre, and 150-litre air cannon tanks. These fit Martin® Hurricane and Typhoon Air Cannons. The largest model measures 36x36x36 inches (91.5x91.5x91.5 cm) and weighs ~175 lbs (~80kg).

Each cube has a sturdy cross-bar frame designed to distribute weight and absorb vibration from the cannon's firing. The central top hole allows easy access to the valve and attachments, while the bottom hole accommodates a standard 4-inch (~10cm), 150 lb (~68kg), 8-bolt ANSI (American National Standards Institute) flange to hold the cannon securely in place. The open sides allow easy access to the flange, hose connection, and tank removal. Solenoid boxes that enable manual firing and control the firing sequence can be conveniently mounted on the side of the rack.

The X-Stand is specially designed to fit different spaces and stack in several configurations for optimum space-saving, safer access, and ease of maintenance. The air cannons are still secured with a tether for added safety. X-Stands are delivered in assembled blocks with all the bolts and nuts required to secure them using standard tools. Air cannons are sold separately.

AIR CANNONS PREVENT DOWNTIME FROM CLOGS

Air cannons are the most effective way to

clear material that's adhered to preheater vessels or silo walls, as well as clogs in hoppers, bins, and drop chutes. Instead of exposing workers to extreme heat, having them beat vessel walls with hammers, or entering dangerous confined spaces, air cannons do the job safely and remotely.

They comprise a 35, 70, or 150-litre tank connected to a compressed air system that delivers a powerful shot triggered from a solenoid box up to 200 feet away. Pointed in the direction the material flows, the high-velocity air passes through a nozzle across vessel surfaces to dislodge adhered material and clogs, promoting efficient throughput with minimal downtime.

Martin Engineering just celebrated the 50th anniversary of inventing air cannon technology. It holds the intellectual property for low-pressure cannons and continues to work on incrementally improving the technology for greater efficiency.

THE X-STAND SOLVES SEVERAL ISSUES

Air cannons are commonly secured to a nozzle assembly next to the vessel. A wire tether ensures the tank doesn't fall should it suddenly detach from the assembly. This positioning can make access a challenge, particularly when the units are set close to a hot wall like a preheater or kiln.

The positioning also becomes an issue when air cannons jut into narrow walkways, or workers must step over 4-inch tubing to access maintenance areas. Since trips and falls commonly top the list of workplace injuries, proper headspace and unobstructed walkways help staff move through the area easily — particularly important when carrying large or unwieldy equipment or replacement parts.

Installing an X-Stand system allows air cannons to be placed in the optimum position and provides the opportunity to rearrange tubing leading to nozzles. Moreover, equipment can be moved away from areas of extreme heat. This reconfiguration ensures safe passageways and maintenance access, improving workplace safety.

"Through testing, we've found that there is negligible air blast power loss by extending the distance a few feet, and only about 5% power is lost with each elbow in the pipe," Dev pointed. "With strategic placement, the X-Stand will deliver safety results that justify any increase in the number of shots per sequence."

Some air cannon installations require mesh tubing to properly accommodate the tank's position and handle vibration from firing. Although commonly made with



metal strands, the mesh tubing is considered a wear part that needs changing after long-term exposure to the punishing production environment, heated walls, and constant vibration. The X-Stand promotes the use of hard pipes with a longer equipment life and less maintenance for added safety and a lower cost of operation.

USE EXAMPLES FROM FIELD TESTS

- ❖ A cement plant operator sought to move cannons farther away from the super-heated kiln wall. The X-Stand construction moved the pipes overhead attached to Y-pipe assemblies with Thermo Safety Shields. The increased distance from the wall allowed for regular maintenance in a comfortable environment. Although nozzle replacement required workers to wear heat suits, the job could be done without downtime. The process was made faster and safer by merely closing the shield guard to prevent blowback, removing the flange in the Y-Pipe, and quickly replacing the nozzle — a 5- to 15-minute operation, depending on positioning.
- ❖ To mitigate molten ash build-up that limited production along a superheated wall in a steel mill, four air cannons were placed to dislodge

material and avoid downtime. To precisely place the air cannon shot, the tanks obstructed the inspection doors, preventing them from opening fully. Moving the tanks to stacked X-Stands a few feet away from the hot wall reduced the heat exposure for maintenance crews and reduced the time and effectiveness of inspections.

- ❖ One bulk material operation had a hopper/silo raised off the ground to load transport vehicles passing beneath. Seasonal changes would raise moisture levels that cause clogging in the downspout. A grated walkway around the vessel was partially obstructed by jutting air cannons. Rather than the standard configuration with the cannons on their sides and valves facing outward, installers set up the X-Stand with the valves facing upward. Holes were cut in the floor grating, and the pipes were run under the walkway toward the nozzle assemblies. This ensured the tanks were organized and the walkway was clear while optimizing production.

IMPROVING SAFETY AND ACCESS

After testing, participating operators said they liked the more organized approach in helping to keep congested operational



The positioning of the cannon can redirect pipes to go underneath the walkway, improving access.

areas as clear as possible. They were impressed with the cleaner look and the innovative solutions to pipe placement. Participants in field tests recognized no substantial change in performance from the original configuration.

"Martin is always listening to customers for ideas to improve safety and efficiency," Dev concluded. "The X-Stand is a result of that and is the next step to a clean, safe, and efficient bulk handling operation."

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*

Martin® X-Stand set away from the hot wall with pipes running overhead.



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 18 factory-owned facilities worldwide, with wholly-owned business units in Australia, Brazil, China, Colombia, France, Germany, India, Indonesia, Italy, Malaysia, Mexico, Peru, Spain, South Africa, Turkey, Kazakhstan, the USA and UK.

The firm employs more than 1,000 people, approximately 400 of whom hold advanced degrees.

ASGCO®'s commitment to performance, innovation, and safety is clear

ASGCO® Manufacturing is a trusted leader in bulk material handling, delivering innovative products and services that enhance the safety, efficiency, and performance of conveyor systems. Since 1971, ASGCO has built a strong reputation for engineering excellence, dependable solutions, and a commitment to customer success.

From high-quality conveyor components and custom-engineered systems to expert belt services and safety training, ASGCO provides end-to-end solutions for the most demanding industrial environments. Its dedication to workplace safety is reflected in robust training programmes that empower teams to recognize hazards, follow best practices, and maintain a safe, productive worksite.

INDUSTRIES SERVED

ASGCO® serves a broad range of industries where efficient, safe, and reliable bulk material handling is essential to daily operations. Through its engineered conveyor solutions and system-wide approach, ASGCO helps companies across multiple sectors improve productivity, reduce downtime, and enhance workplace safety.

CEMENT MANUFACTURING

In the cement industry, consistent and controlled material flow is crucial. ASGCO designs conveyor components that optimize the handling of raw materials like limestone and clay, as well as finished cement products, helping facilities maintain efficiency and minimize maintenance.



AGGREGATE & CONSTRUCTION MATERIALS

ASGCO works with producers of sand, gravel, crushed stone, and concrete materials that form the backbone of construction and infrastructure projects. From quarries to processing plants, ASGCO systems ensure smooth transport, reduced spillage, and improved wear life for equipment in rugged environments.

POWER GENERATION

Whether it's a coal-fired plant, a natural gas facility, or a renewable energy operation, ASGCO provides solutions for the movement of fuel sources and byproducts such as coal, biomass, fly ash, and gypsum. Its systems help reduce dust, improve flow, and support environmental compliance.

MINING

ASGCO plays a vital role in mining operations by providing rugged and custom conveyor components for the extraction and transportation of minerals like coal, copper, gold, iron ore, and more. Its load zone containment and belt cleaning technologies ensure continuous uptime and reduced carryback.

GENERAL MANUFACTURING & INDUSTRIAL

From steel and automotive to chemical, food processing, and pharmaceutical manufacturing, ASGCO helps industrial facilities handle raw materials, components, and finished goods with greater efficiency. The company's engineered systems improve throughput, reduce wear on machinery, and create safer working conditions.

Across all these sectors, ASGCO's commitment to performance, innovation, and safety enables businesses to optimize their conveyor operations and meet the demands of modern material handling.

WHAT DOES ASGCO MANUFACTURE?

ASGCO manufactures a wide range of conveyor components aimed at boosting performance and reducing downtime.

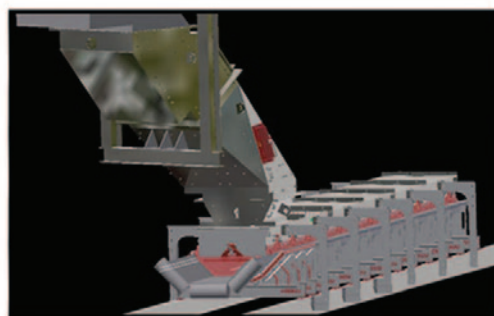
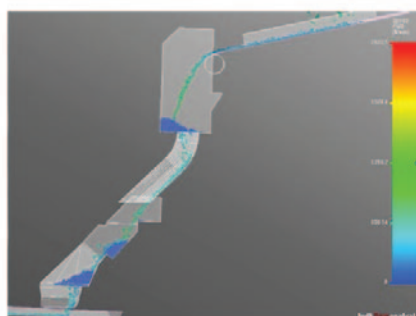
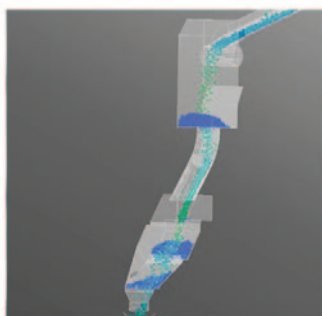
❖ **Load zone support products:**

products like impact cradle beds and slide-n-roll beds absorb impact energy and provide stable belt support, reducing belt sag and ensuring proper sealing along the skirting.

- ❖ **Conveyor belt cleaners:** ASGCO's Skalper® primary belt cleaners are known for their patented torsion spring technology, maintaining consistent blade-to-belt contact to effectively remove carryback. This not only minimizes material loss but also reduces cleanup and extends

equipment life.

- ❖ **Pulley lagging and belt tracking:** with options such as ceramic and rubber pulley lagging, ASGCO helps prevent slippage and enhances drive pulley performance. Its Tru-Trainer® belt tracking idlers automatically centre misaligned belts, reducing edge damage and downtime.
- ❖ **Safety and guarding solutions:** ASGCO prioritizes worker safety through products like the Safe-Guard® line of return idler guards, conveyor



Eliminating spillage and restoring load zone integrity at a cement plant.

covers, and easy-access inspection doors — ensuring critical areas are both protected and accessible for maintenance.

ENGINEERED CHUTE AND LOAD ZONE SYSTEMS

ASGCO's engineered chute and load zone systems are designed to optimize material flow, reduce wear, and control dust and spillage during the transfer of bulk materials. These systems play a critical role in ensuring safe and efficient operation, especially when handling hazardous materials like cement clinker. By incorporating dust curtains, stilling boxes, and correctly sized load zones, ASGCO helps contain silica dust and prevent slip hazards. Products like impact cradle beds and slide-n-roll beds provide belt support and reduce deflection, while skirt walls with replaceable wear liners and external skirting maintain a tight seal for cleaner, safer operation.

RECENT PROJECT SUMMARY: LOAD ZONE CHUTE REDESIGN & SKIRTING SYSTEM UPGRADE

CHALLENGES

A misaligned step chute was causing material to load off-centre onto the conveyor belt, forcing product into the right-side skirt wall. The continuous impact led to accelerated wear, resulting in frequent spillage and ongoing patching efforts. Years of hardened cement build-up buried the load zone, making inspections and maintenance nearly impossible. Additionally, the existing skirt walls and clamps were heavily corroded and seized, rendering skirting adjustments impossible.

SOLUTIONS

ASGCO® engineers conducted a comprehensive on-site evaluation, including point cloud scanning and 3DEM simulation analysis, to pinpoint the root cause. The investigation confirmed that the step chute's design was the source of the misalignment. ASGCO® removed the existing chute and replaced it with a custom-engineered centre-loading chute to correct material flow. The hardened build-up was cleared to restore safe access to the load zone. The outdated skirting system was fully replaced with a sealed ASGCO® system, featuring adjustable AR400 skirtboard liners, MDX skirt clamps, and ORG skirting for superior sealing and maintainability.

RESULTS

The new centre-loading chute eliminated

belt mis-tracking and side-wall impact, completely resolving spillage issues. The load zone now operates cleanly and efficiently. Maintenance has become quick and straightforward with the inclusion of MDX clamps and slotted AR400 liners. Overall, system reliability has been restored, and downtime due to maintenance has been dramatically reduced.

WHAT MAKES ASGCO STAND OUT?

ASGCO has built a strong reputation through its innovative use of technology and its holistic, performance-driven approach to conveyor solutions. By leveraging advanced 3D Point Cloud Scanning, ASGCO captures hundreds of millions of data points to create precise

digital models of conveyor systems and their environments. This enables highly customized engineering particularly in chute and load zone design based on detailed analysis of material characteristics, flow rates, and operational stress points.

But what truly differentiates ASGCO is its commitment to system-wide performance. Rather than focusing solely on individual components, ASGCO designs every product to function as part of a cohesive system, improving overall reliability, safety, and environmental compliance. From minimizing dust and spillage to protecting belts and reducing downtime, ASGCO delivers comprehensive solutions that enhance both productivity and safety across the entire operation.



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Dust under control: WAMGROUP solutions for cement handling

Efficiently managing dust during the handling, loading, and storage of cement not only preserves product value but also safeguards worker health, protects equipment, and upholds environmental standards.

DUST: A PERSISTENT COMPANION IN CEMENT OPERATIONS

Dust generation is an unavoidable by-product at nearly every stage of cement production — from quarry extraction and raw material preparation to clinker handling and final product packaging. If uncontrolled, dust emissions can trigger health and safety issues for workers, strain relations with nearby communities, and draw the scrutiny of regulators.

The presence of coarse dust particles (greater than 10µm) can degrade air quality in surrounding areas, creating visible plumes that erode public trust and social licence to operate. More insidiously, fine particulates (PM10 and PM2.5) pose respiratory risks due to their ability to penetrate deep into lung tissue. Their small size allows them to remain suspended in the air for long periods, increasing the likelihood of exposure and environmental dispersion.

From a process perspective, dust also compromises visibility — especially during ship loading — and can damage equipment when it accumulates and hardens in unwanted places. Mitigating these risks requires proactive, integrated dust management solutions.

TARGETING DUST AT THE POINT OF LOADING

Among the critical control points in cement handling is the loading operation — whether to road tankers, rail wagons, barges or bulk ships. These must be rapid and efficient, but also contain dust within strict limits.

WAMGROUP's TOREX Division has developed a range of loading spouts designed to meet these dual demands. The BELLOJET ZA loading spout is engineered for tanker loading up to 250m³/h. It features a tapered inner chute to streamline material flow, surrounded by a dual-bellows system for dust capture. At the discharge point, a polymer-coated cone forms a tight seal with the tanker inlet, ensuring no dust escapes.

During loading, a continuous suction system draws air through the bellows into integrated filter cartridges equipped with TOREX's proprietary nanofibre elements. These filters ensure high-efficiency dust



VIG slide gate valves and ES screw conveyors & feeders for cement production.

separation. Meanwhile, the spout automatically adjusts its position as the tanker fills to maintain a sealed connection throughout the cycle.

To prevent dust release at the end of loading, a level sensor halts material flow at capacity, while the spout remains in place for several seconds to allow residual dust to be extracted. An automatic pulse-jet system then cleans the filters, returning collected dust to the tanker.

For ship loading, the ZX and ZQ loading spouts offer capacities of 550m³/h and 1,800m³/h respectively. Both designs retain the dust-sealing features of the BELLOJET, with additional enhancements like peripheral dust skirts and connection points for external dust extraction systems.

BETWEEN LOADS: DUST ISOLATION AND INTERCEPTION

When operations pause, effective sealing becomes critical to avoid passive dust release. The VIG low-profile slide gate valve, manufactured from WAM's abrasion-resistant SINT polymer, is a durable and compact solution for intercepting cement flow. Easily integrated with standard flange configurations, the VIG provides long-lasting, dust-tight performance across a wide range of installations.

PROTECTING THE SILO DURING REFILLING

Dust hazards escalate during silo refilling due to the potential for overfilling or internal overpressure. The KCS Silo Safety System from TOREX offers a comprehensive approach to silo management. It



SILOTOP PolyTUBE
venting filters.

monitors and controls a variety of inputs including pressure levels, valve positions, tanker coupling status, and venting filter performance.

The system automatically prevents overfilling and excessive pressure buildup, significantly reducing the risk of structural damage and dust emissions. It also automates filter cleaning and alerts operators to potential issues, providing full control across up to 32 silos.

DUST FILTRATION: VENTING WITHOUT WASTE

With more than two decades of global application, WAM AIR's SILOTOP venting filters have become a benchmark in silo dust management for the cement industry. Designed for top-of-silo installation, these

compact and reliable filters are equipped with vertically mounted POLYPLEAT nano-fibre filter cartridges, which clean displaced air during silo loading before it is vented into the atmosphere. This not only ensures regulatory compliance but also preserves valuable product.

A key feature of the SILOTOP system is its built-in pulse-jet cleaning mechanism, which automatically removes accumulated dust from the filter surface. The dust is then returned into the silo, eliminating material loss and preventing airborne emissions — a dual benefit for operational efficiency and environmental protection.

The POLYPLEAT nanofibre media offers high filtration efficiency, even with ultra-fine particles like PM2.5 and PM10. Unlike traditional filter media, the nano-fibres trap

dust on the surface rather than allowing it to penetrate the structure, making cleaning more effective and requiring less energy. This translates into lower operating costs, longer filter life, and better overall performance in high-dust cement applications.

Now, with the introduction of the new PolyTUBE technology, the SILOTOP range takes another leap forward. The PolyTUBE design replaces traditional cartridges with an array of smooth-surface filter tubes arranged vertically, enhancing airflow distribution and reducing pressure drop across the unit.

The smooth internal surface of the tubes prevents dust buildup; a step-change in performance — providing even better filtration, easier maintenance, and reduced energy consumption.

ENGINEERING CONTROLS: THE GOLD STANDARD IN DUST MITIGATION

While PPE and exposure limits play a role in workplace safety, engineering controls like those offered by WAMGROUP provide the most effective protection by removing the hazard at its source. These systems isolate dust from people and the environment, ensuring compliance with growing regulatory expectations and reinforcing a plant's social and environmental responsibilities.

In an era where cement's environmental footprint is under increasing scrutiny, adopting high-efficiency dust control technologies is more than operationally prudent — it's a strategic imperative.



Elevating cement production: the proven power of Sandwich Belt high angle conveyors

Sandwich Belt high angle conveyors are a proven and versatile solution for continuously elevating or lowering bulk materials at steep angles — up to 90°. These systems have been widely adopted across a variety of industries to handle everything from coal and copper ore to municipal sludge, RDF (refuse-derived fuel), grains, gypsum, and hot clinker. Having demonstrated throughput rates from 0.27 to 4,000tph (tonnes per hour) and lift heights between 3.66 and 175 metres, these conveyors are especially well-suited for transporting raw feed materials in cement production — often replacing older, less efficient conveying methods.

PROVEN PERFORMANCE IN CEMENT PLANT INSTALLATIONS

Long before founding Dos Santos International (DSI), J.A. Dos Santos played a key role in several cement plant installations using Sandwich Belt high angle conveyors. One of the earliest was in an underground gypsum mine, where a vertical system elevated crushed gypsum



The DSI Sandwich Belt high angle conveyor offers a small footprint, elevating 720tph of limestone, iron ore, sand and clay at a 60° angle.

rock to the surface. Material was reduced to a conveyable size and fed onto the Sandwich conveyor via a plate feeder. At the surface, the conveyor discharged onto a plant conveyor feeding either an outdoor storage pile or directly into the processing

plant. This vertical configuration replaced a horizontal feed conveyor and bucket elevator, streamlining the process and eliminating a high-maintenance transfer point.

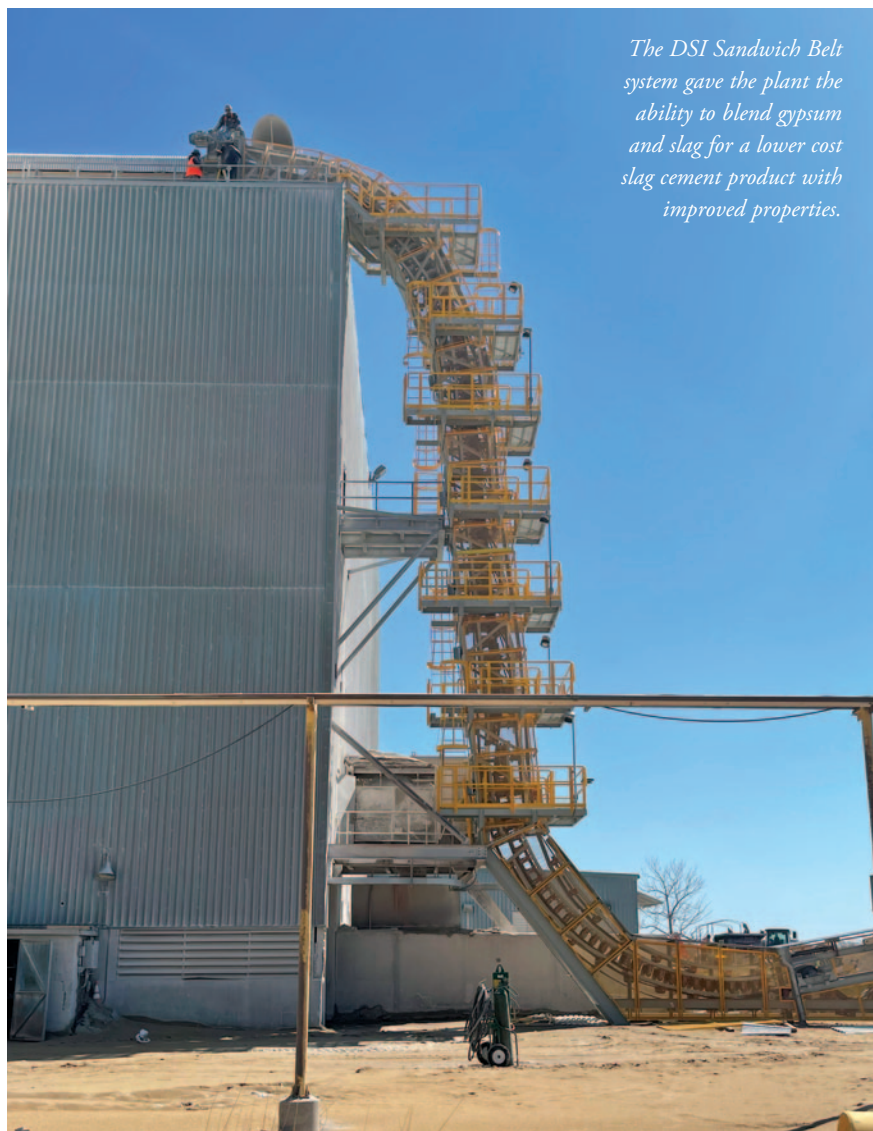
Closer to the cement production process, a system installed at Steel Cement Company in Melbourne, Australia, exemplified the integration of this technology into a fully automated plant. Steel mill slag and gypsum, stored in open stockpiles after being shipped in — mostly from Japan — were loaded into holding bins. The Sandwich Belt conveyor, fed at multiple points, blended these materials by metered feeding onto the lower infeed belt. From there, the mixture was elevated and discharged directly into a grinding mill, producing fine cement without the need for firing, since the slag acted as clinker.

In another example from the southeastern United States, a Sandwich Belt system was used to deliver various raw materials — limestone, gypsum, sand, and iron ore — to storage bunkers feeding a kiln. This setup featured a long approach with multiple feed points. Blending was achieved via a crane-mounted clamshell that stocked materials over respective apron feeders. Replacing a horizontal conveyor and bucket elevator, the 90° arrangement eliminated a transfer point, significantly reducing both operational and maintenance costs.

Additionally, Sandwich Belt conveyors have proven effective in hot material handling. One such installation replaced a long approach conveyor and pan elevator system, managing hot, powdery clinker, gritty pozzolanic sand, and lumpy gypsum rock. This setup provided continuous material flow from source to discharge, without intermediate transfers — improving efficiency and cutting costs.

ADVANCING THE TECHNOLOGY FOR THE ENVIRONMENT

A project in Pitimbu, Brazil, demonstrates the system's adaptability and environmental benefits. In partnership with Zanella Engenharia e Industria de Maquinas, DSI installed a Sandwich Belt conveyor at a cement plant designed with environmental protection in mind. The compact layout was achieved by elevating 720tph of limestone, iron ore, sand, and clay at a 60° incline, keeping the facility's footprint minimal.



The DSI Sandwich Belt system gave the plant the ability to blend gypsum and slag for a lower cost slag cement product with improved properties.



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The unit in Brazil is the first commercial system to incorporate the DSI Edge Brush.

The client, Brennand Cimentos, sought improved handling of challenging raw materials. This led to the introduction of the first DSI Edge Brush — a minimal-moisture system designed to prevent bulk material from migrating toward the edges of the belt. While most materials do not require such mitigation, those that do are handled more cleanly and efficiently with this system.

The DSI Edge Brush uses precision water flow and monitoring, based on bulk material feed rate and belt speed, to ensure optimal application. Sonic sensors and belt speed monitors work in tandem to manage the brush's operation, keeping the system completely dry when not in use.

The conveyor system at Paraiba features an extended loading zone with five separate feeders and chutes. It also includes a cross-belt magnet for tramp iron removal and an analyser to ensure a consistent raw mix. In full operation, the plant produces 3,000 tonnes of clinker per day and 1.5 million tonnes of cement annually.

EXPANDING INSTALLATIONS AND VERSATILITY

Following the Paraiba project, Dos Santos International was awarded a contract to supply a DSI Sandwich Belt high angle conveyor to Lafarge Holcim's Sparrow Point Slag Cement facility. This system elevates 122tph of natural gypsum at an 85° incline to a feed hopper, showcasing the system's ability to fit within tight spatial constraints.

The conveyor is loaded via two front-end wheel loaders that feed into hoppers and feeders. From there, material is elevated by the Sandwich conveyor and discharged onto a conventional conveyor, which delivers it to an additional feed hopper. The flexibility of the system allowed it to be easily integrated into the existing building layout while maintaining operational efficiency.

As with other installations, this setup utilizes two smooth-surfaced, face-to-face belts to securely contain material during transport. This design not only allows for steep conveying angles but also ensures an environmentally sound operation.

The use of standard conveyor components further guarantees high availability, low maintenance costs, and rapid replacement part delivery when needed.

With the ability to accommodate wider belts and accompanying hardware, DSI Sandwich Belt conveyors can achieve capacities exceeding 10,000tph, vertical lifts of up to 300 metres, and typical high-angle configurations reaching 90° — providing

superb performance in bulk material handling.

RELIABLE, SUSTAINABLE AND VERSATILE

Sandwich Belt high angle conveyors have found applications in a broad spectrum of industries, thanks to their ability to handle a wide range of materials. As demonstrated in these cement industry installations, the technology offers a reliable, continuous conveying solution that reduces transfer points, simplifies processes, and supports environmentally conscious plant designs.

Dos Santos International continues to advance high angle conveyor systems, contributing to more efficient, sustainable cement production while offering smaller physical and carbon footprints. These systems remain an ideal solution for elevating raw cement plant feed materials with precision and reliability.

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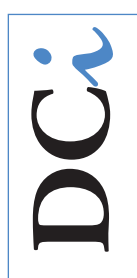
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