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featuring...

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Coal trade's fading strength

Over the past few months indications of more support for import demand in some countries have been emerging. Conversely, adverse influences are prominent elsewhere, possibly resulting in a fairly flat annual volume of world seaborne dry bulk trade this year followed by limited growth prospects in 2026.

A marginally brighter outlook than foreseen previously, for economic growth in many of the countries importing dry bulk commodities, was suggested by the International Monetary Fund in its end-October assessment. But the net result of calculations is that world gross domestic product growth, after 3.3% last year, is likely to be reduced to 3.2% in 2025 and 3.1% in 2026, relatively subdued progress compared with past performance. China, in particular, still seems to in a sustained deceleration phase.

Coal

Further confirmation that perceptions of coal trade prospects have become mainly negative was provided by last month's revised forecast by analysts at the Australian Government's Department of Industry. The figures include all world trade in coal, which is mostly seaborne.

This update shows global coal trade totalling 1,456mt (million tonnes) in 2025, a 95mt or 6% decline from the previous twelve months. More than half of that decline is expected to occur in China, where imports could be 56mt or 10% lower at 487mt. India and Japan may also see reduced volumes. In 2026 a further world trade decline of about 18mt (1%) to 1,438mt is predicted, amid a sustained downwards trend in China and extended weakening in other countries.

Iron ore

In the iron ore segment there have been few signs of expansion ahead. Some figures suggest roughly unchanged volumes of world seaborne trade both this year and more tentatively next year, at around 1,600mt annually, of which China's imports form the dominant part, over three-quarters of the total.

Crude steel production in China is estimated by AGDISR to decline by 4% in 2025 from last year's level, to 968mt. The weakening envisaged reflects ongoing difficulties in the property, especially residential construction and other domestic steel-consuming industries, partly offset by rising exports of steel products. Restraints seem likely to continue into and through 2026, pointing to possible flat or lower import demand for iron ore.

Grain & soya

Indications of an upturn in world grain trade over the next twelve months have been emerging, following weakness in the preceding period. Increased imports into Asian countries are foreseen, and these could be accompanied by additional volumes required by other importers around the world.

The latest available (September) forecasts by the US Department of Agriculture showed world trade in wheat, corn and other coarse grains, plus soyabeans and meal rising by 4.6% in the 2025/26 marketing year beginning 1 October. The total including land movements but mostly seaborne, as calculated by Bulk Shipping Analysis, could be 31mt above the previous year's figure at 722mt.

Minor bulks

Within the minor bulks segment, 'agricultural bulks' such as oilseeds and meals, rice, sugar and several other commodities comprise substantial trade. World seaborne volumes in this sub-category have been growing in recent years, reaching about 205mt in 2024, and further growth could be seen during the current year and further ahead, based on present expectations of potential strengthening in global import demand.

Bulk carrier fleet

Vessels of 100,000 deadweight tonnes and over comprise the Capesize fleet of bulk carriers — a size group which statistically includes Newcastlemaxes as well as larger ore carriers. As shown in table 2, Capesize fleet growth has averaged about 2% annually in the past few years, including an estimated 1.5% in the twelve months to end-December 2025. Next year newbuilding deliveries could be higher, but more scrapping may occur, resulting in a broadly stable fleet growth rate.

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

	2020	2021	2022	2023	2024	2025*
Japan	118.5	124.3	126.8	113.2	116.5	117.0
South Korea	96.1	97.6	97.5	92.6	86.0	76.0
Taiwan	54.6	56.3	51.0	46.9	46.0	45.0
China	193.4	241.2	197.5	313.8	359.0	320.0
India	167.5	136.2	173.0	188.8	175.5	170.0
Total of above	**630.1**	**655.6**	**645.8**	**755.3**	**783.0**	**728.0**

source: various & BSA estimates

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

	2020	2021	2022	2023	2024	2025*
Newbuilding deliveries	25.1	19.0	10.3	10.7	7.7	7.5
Scrapping (sales)	11.4	3.4	2.9	1.0	0.8	1.5
Losses	0.5	0.0	0.0	0.0	0.0	0.0
Plus/minus adjustments	0.0	0.0	0.1	0.0	–0.1	–0.1
Fleet at end of year	**361.3**	**376.9**	**384.4**	**394.1**	**400.9**	**407.0**
% change from previous year-end	+3.8	+4.3	+2.0	+2.5	+1.7	+1.5

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

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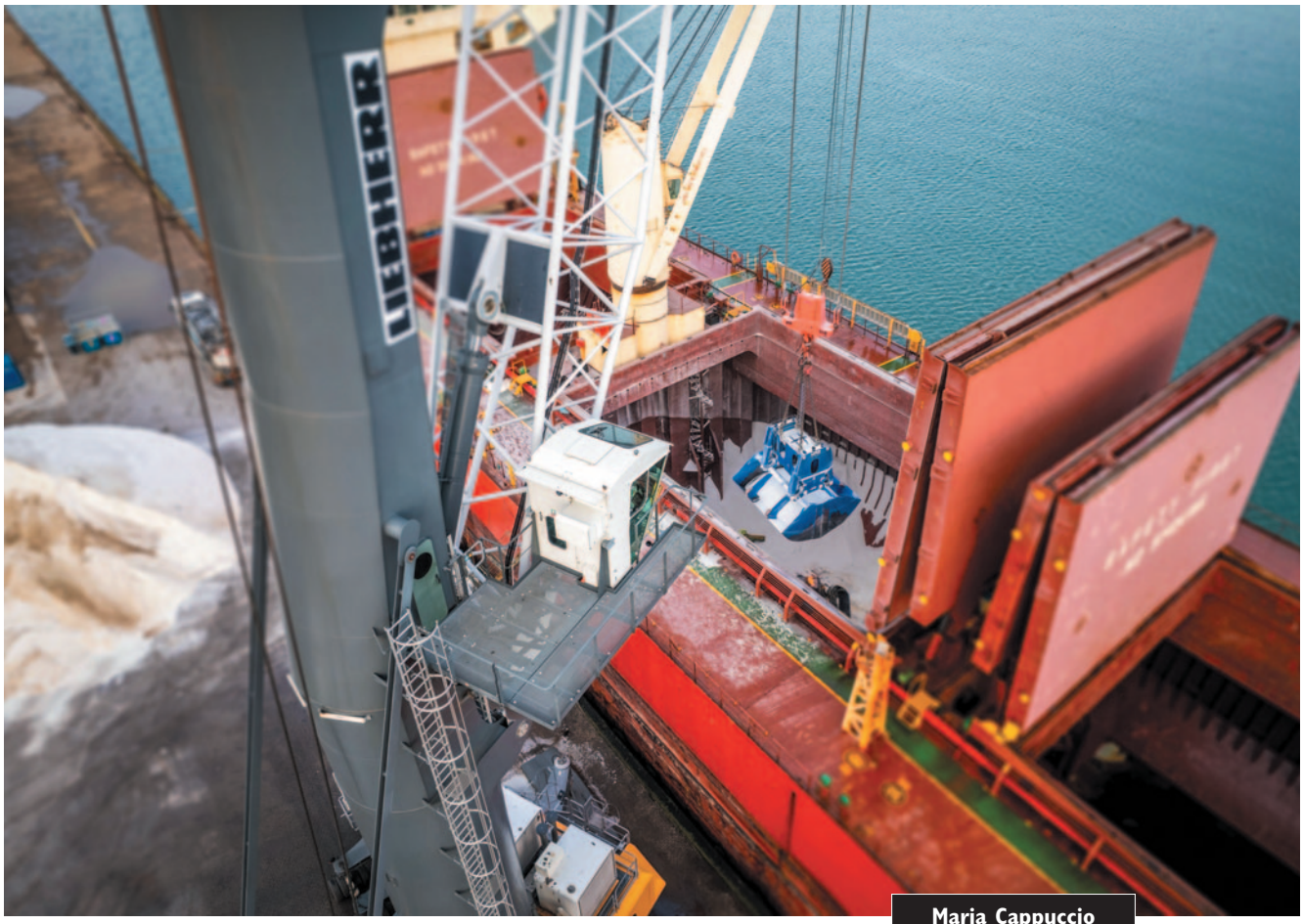
Fertilizer recovery faces record crops...

... and tight farm margins in 2025/26



Maria Cappuccio

Amid a challenging trade environment and heightened macroeconomic uncertainties, the International Monetary Fund (IMF) forecast the global economy to grow by 3.2% in 2025 and 3.1% in 2026, both remaining well below expectations at the start of the year. The modest upgrade to the 2025 outlook reflects stronger than expected frontloading of economic activity ahead of new US tariffs, and pro-growth policies in several large economies. In the US, growth is weaker and inflation higher than projected last year. Advanced economies expected to grow around 1.5% and emerging market and developing economies just above 4%. The IMF project inflation is to continue to decline globally, with variation across countries — above target in the US-risks tilted to the upside and subdued elsewhere

The global grains and oilseed markets look to be supplied with record quantities of cereals, coarse grains and oilseed crops provisionally forecast at over 3.6bn/t in 2025/26. Projections of strong global crop yields continue to pressure commodity markets, leading to lower prices often below the cost of production. As a result, farmers worldwide are experiencing rising costs, decreased margins in contrast to previous years.

'Hand in Hand for Better Foods and a Better Future'

The UN's Food and Agriculture Organization (FAO) celebrated its 80th birthday on World Food Day, which is held each year on the 16th October. In choosing the theme for this year, the FAO called for global solidarity in creating sustainable, equitable food systems, by emphasizing the need for better production, better nutrition, a better environment and a better life. A large number of delegates attended the events in Rome including Pope Leo XIV, who made a heartfelt appeal for the many peoples suffering hunger and violence in Ukraine, Gaza, Haiti, Afghanistan, Mali, the Central African Republic, Yemen and South Sudan. In his closing remarks Pope Leo quoted Jesus' words to His disciples, "Give them something to eat" (Mk 6:37). This Gospel command, he said, "remains a pressing

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VLI reports record fertilizer imports

Brazilian port, railway and terminal operator VLI reports that September was a record month for fertilizer imports. A total of 285,000 tonnes was offloaded at its Port Integrator Terminal Luiz Antonio Mesquita (Tiplam), which is located in the Port of Santos. The imported fertilizer was inbound from, China, the Middle East and North America for use by customers in the states of Goiás, Mato Grosso, São Paulo and Minas Gerais.

Much of this was moved by rail, with VLI accounting for 90% of domestic rail transport of sulphur, rock phosphate and ammonia.

Tiplam's main role is to serve as a hub for Brazil's so-called south-east corridor, which involves providing logistics services to the states of São Paulo, Goiás and Minas Gerais. In May, draught was deepened alongside the main quay, and has proved vital in boosting larger volumes, including handling a record consignment of 72,600 tonnes in a single operation.

VLI operates in three main logistics corridors in Brail. Apart from Tiplam, it has connections from the so-called Mineral Triangle to ports in the state of Espírito Santo and also links Tocantins in the country's north with the ports of São Luís. *Barry Cross*

challenge for the international community."

Global fertilizer use to rise 2025/26

Fertilizer demand recovery in the last two years has varied in pace and scale by region, nutrient and crop, at a time when farmers continue to experience higher costs of growing crops and remain sensitive to input costs. While some areas benefit from government support and favourable crop-to-fertilizer price ratios, others face affordability constraints that limit application rates.

Fertilizer prices have continued to rise in the first nine months of 2025 reflecting strong demand, trade restrictions and production shortfalls. Given lower grain prices, higher fertilizer and other input costs have reduced profits for many agricultural producers.

The International Fertilizer Association (IFA) revised their forecast for global fertilizer use to 210mt (million tonnes) Nutrients in 2025 with a further increase to 224mt Nutrients by 2029 (Nitrogen 125mt N, Phosphates 51mt N and Potash 48mt N).

Pressures on farm finances

Higher and persistent input cost pressures including rising fertilizer prices, elevated interest rates continue to have a direct impact on farm finances. This increase comes at a time of shrinking crop receipts, especially for major row crops, leaving farmers with thin and negative margins. Seasonal swings in natural gas markets during the winter and shifting Chinese export policies, likely to create added price uncertainty to the end of the year and the first quarter of 2026. While some relief is expected in crop protection costs, overall operating expenses are seen trending higher, posing substantial challenges for producers of cereals, grains and oilseeds. According to Rabbobank, despite tight margins, farmers seem committed to investing in their fields to sustain or expand output.

Projections indicate record crops for wheat, corn and soybeans, with major regions driving this growth. Record production levels to exert downward pressure on commodity prices

Sharp rise for TSP & DAP

Fertilizer prices rose in the third quarter of 2025, driven by sharp increases in October for diammonium phosphate (DAP) and triple superphosphate (TSP), while muriate of potash (MOP) marginally lower following strong increases in the previous two quarters. The overall increase reflects strong demand, trade restrictions and some

GLOBAL FERTILIZER USE

Global Fertilizer Use 1961/2–2028/29mt Nutrients

Year	Nitrogen	Phosphate	Potash	Total
1961/2	11.6	10.9	8.7	31.2
1970/1	31.8	21.1	16.4	69.3
1980/1	60.8	31.7	24.2	116.7
1990/1	77.6	36.0	24.6	137.8
2000/1	81.2	32.5	21.9	135.6
2001/2	82.9	33.4	23.0	139.3
2002/3	85.1	34.1	24.7	143.9
2003/4	87.1	35.2	25.5	147.8
2004/5	90.2	37.5	25.6	154.7
2005/6	93.2	37.0	26.3	156.5
2006/7	97.4	38.1	26.9	162.4
2007/8	100.5	38.4	28.9	167.9
2008/9	97.7	33.7	23.4	154.8
2009/10	102.2	37.6	23.7	163.5
2010/11	104.1	40.6	27.5	172.3
2011/12	107.9	41.4	28.0	177.2
2012/13	108.6	41.4	29.2	179.1
2013/14	109.9	40.5	30.4	180.7
2014/15	110.3	41.1	32.0	183.4
2015/16	108.0	41.0	32.0	181.0
2016/17	107.7	46.0	35.3	189.1
2017/18	107.9	46.7	36.9	191.5
2018/19	105.0	46.0	38.0	189.0
2019/20	109.0	47.0	37.0	193.0
2020/21	113.0	49.0	40.0	202.0
2021/22	110.0	48.0	38.0	196.0
2022/23	110.00	44.0	35.0	189.0
2023/24	114.0	46.0	38.0	198.0
2024/25	118.0	47.0	41.0	206.0
2025/26	120.0	48.0	42.0	210.0
2028/29	125.0	51.0	48.0	224.0

Source: FAO, IFA

production shortfalls-especially in the case of urea.

US TARIFFS ON KEY FERTILIZERS REMOVED

US tariffs on imported fertilizers introduced in April '25, that led to shortages and elevated fertilizer prices for US farmers, have subsequently been removed by a White House Executive Order 1425, which took effect on 13 November '25. The exemptions apply to urea, ammonium nitrate, UAN, ammonium sulphate, TSP, DAP and MAP. The US trade representative, confirmed, potassium fertilizers like MOP were exempt from import tariffs. When questioned about a 10% tax on potash, the US official suggested it may depend on the terms of existing or ongoing trade negotiations with each country. Information regarding potash and ammonia's status remain less clear.

Nitrogen: a standoff with port authorities over port access and feedstock issues prompted Nutrien's decision to halt operations on October 23rd at its ammonia plants on Trinidad and Tobago, which had an immediate impact. Algerian spot sales rose higher, providing the catalyst for a price rally in North Africa. Algeria's Sorfert concluded 60,000/t of sales at $625p/t fob (+$25p/t) shortly after the Nutrien shutdown. Prices increased for other nitrogen-based fertilizers, including anhydrous, UAN28, during this period. Nutrien's shutdown of its four plants cost the market 85,000/t per month-with exports over 1mt in 2024. The plants are not expected to reopen in the near future. Higher prices for urea c.$400mt (Oct '25) due to the EU's import tariffs on fertilizers from Russia, Middle East conflicts and strong demand. Other nitrogen-based fertilizers, including anhydrous and UAN28, saw increases during this period. Recent activity includes a tender for granular urea. Black Sea Urea Spot c.$461.13mt (Oct '25). Middle East FOB c.$395.25mt (Oct '25).

DAP (Diammonium Phosphate): DAP prices are forecast to rise in 2025, before falling in subsequent years as new capacity eases supply pressures. The forecast assumes that Russia will continue diverting exports from Europe to Brazil and India. Additional export restrictions, supply disruptions, or spikes in ammonia or natural gas prices likely to push DAP prices higher. China's phosphate exports have been curbed to satisfy inputs for lithium-iron-phosphate batteries used in electric vehicles.

MOP (Muriate of Potash): underpinned by firm demand prices are expected to rise by 19% in 2025, with moderate falls in 2026. This depends on whether a faster-than-expected expansion, of Belarusian exports through other routes. The 25% US tariff on Canadian potash in March '25, has caused US prices to rise more quickly than in other markets. Canada is the largest supplier to the US. The increased costs directly impact the US Gulf price. More recently, the EU introduced tariffs on agricultural imports, including nitrogen fertilizers from Russia and Belarus. This caused a rerouting of these fertilizers to Asia and the Americas. Canadian exports have shifted toward the EU. MOP demand has recovered, prices expected to rise c.5% in '25 y/y stabilizing in 2026. Belarus rising exports and Canada's significant output to exert downward pressure on MOP prices.

PROSPECTIVE PLANTINGS 2025/26

Favourable conditions for the US wheat crop this autumn across key growing areas, with little drought pressure. Mostly dry, with a mild cold front passing through the Central Plains with overall crop conditions still good. Rainfall in Washington, Oregon, Idaho and Montana helped reduce moisture deficits in those growing areas. US wheat crop is forecast at 54mt. Canada wheat 37mt (Spring 26.6mt, Winter 3.5mt durum 6.5mt). In the eastern provinces, the harvest is virtually complete, while on the Prairies, farmers in Saskatchewan and Manitoba have faced weather delays.

FERTILIZER FOB PRICES $ PER TONNE 2020–2025

	2020 Oct Wk3	2021 Oct Wk2	2022 Oct Wk2	2023 Oct Wk2	2024 Oct Wk3	2025 Oct Wk3
Urea	$	$	$	$	$$	$
Baltic	245	418.8	678	424.19	—	400.00
Persian Gulf	270	800	678	484.62	374–400	394.75
US Gulf	240	700	—	484.29	370	378.00
Ammonia						
Yuzhny	220	700	—	—		
Tampa CFR	228	558	1,175	700–725	480	590.00
Middle East	—	—	1,200	—	400	405.58
Ammonium sulphate	—	—	—	—	—	
FSU	—	—	—	—	—	
Asia CFR	126	—	—	270	—	190.00
Diammonium phosphate						
North Africa	—	—	—	—	—	620.00
US Gulf	360	727	752	534.75	573.4–580	875.00
China	357	—	514	639	—	738.00
Baltic	340	—	731	—	—	—
Triple super phosphate						
North Africa	—	—	—	—	152.5	589.00
US Gulf	290	618	708	468.13	503.8	652–660
Muriate of potash						
Baltic	190	220*	—	—	—	286.00
Brazil CFR					278—290	285–295
Vancouver	245	230*	562.50	341.90	—	352–350
US Gulf	202	740	—	341.88	283	352.50*

**US tariff on Canadian potash in March 2025, caused prices to rise more quickly than in other markets as increased costs directly impacted the US Gulf price.*

EU winter wheat planting prospects are generally positive, overall good yield potential and increased planted areas in Germany and France. However, some regions face challenges, including persistent drought in central France, Germany, and Hungary, and excessive rainfall in Northern Italy and the Baltic region, which could impact yields in those areas. EU soft wheat is forecast at a record 142.3mt.

Russia's wheat plantings are expected to fall due to a 4% cut in acreage in 2025/26. Farmers are said to shift focus to oilseeds-rapeseed and sunflowerseed, responding to demand from China for oilseeds and logistical challenges in certain regions. Despite lower acreage, Russian Federation output is forecast higher at 88.6mt.

Southern hemisphere crops

Australia's wheat crop for 2025 is possibly a near record, despite a slow start to the season, recent estimates suggest the wheat crop could be c.34–36mt. Argentina's wheat harvest (12 Nov) is 15% complete, forecast at 24.5mt by Rosario Grain Exchange (Buenos Aires Grain Exchange 24mt).

Record 3.6bn/t crop in prospect in 2025/26

Record year for cereals, weather permitting, especially for wheat and coarse grains, with small increase for oilseed crops, forecast at over 3.6bn/t in 2025/26. For wheat significant increase in the EU 142mt, with larger crops in the Russian Federation, Canada, Argentina, Australia and in some other countries.

Coarse grains driven by huge US corn crop

This year reflects a sharp rise in the US corn crop forecast at 426mt with large corn crops also anticipated in Brazil 131mt (Conab 138.7mt)

Argentina's corn plantings also expanded significantly, with the crop forecast at 53mt.

Rising demand for biodiesel supports Brazil's soya demand in 2025/26

US soybean crop forecast at 115.7mt. Brazil's soybean output on increased acreage is forecast at a record 175mt

GLOBAL CEREALS & OILSEEDS-PRODUCTION, USE & STOCKS 2024/25–2025/26MT

	Prod 24/25	Prod 25/26	Use 24/25	Use 25/26	Trade 24/25	Trade 25/26	Stocks 24/25	Stocks 25/26
Wheat	801	829	810	819	204	218	261	271
Coarse grains	1,538	1,586	1,576	1,576	230	241	321	311
Sub-total	**2,313**	**2,402**	**2,386**	**2,395**	**434**	**459**	**582**	**582**
Rice	541	541	532	542	60	62	188	187
Total	**2,854**	**2,943**	**2,918**	**2,937**	**494**	**521**	**770**	**769**
Oilseeds	684	688	*566	*578	215	214	142	142

*USDA *oilmeals-excl.fish meal. Wheat Stocks (World 146mt, China 125mt)1 Coarse Grain Stocks (World 136mt, China 175mt)²*

Siwertell 600tph ship-unloader at Yara International's Norwegian fertilizer terminal in Glomfjord.

(USDA) 177.6mt (CONAB). The expansion in soybean acreage is driven by strong domestic (biodiesel mandate) and international demand. From August, Brazil raised its biodiesel blend from B14 to B15 (diesel fuel must contain 15% biodiesel). For the first time in five years, soybean planting in Argentina's central region started the season with optimal water reserves with a crop forecast at 48.5mt.

EU's Carbon Border Adjustment Mechanism (CBAM) applies from January 1 2026

CBAM introduces a price on carbon for fertilizers imported into the EU. The tax is expected to impact nitrogen-based fertilizers like anhydrous and UAN28 According to the EU this requirement has been introduced to level the playing field as EU producers are currently exposed to a domestic carbon price under EU ETS, which would otherwise become a competitive disadvantage as free allowances are gradually phased out. The carbon cost for both EU producers and importers into EU, will depend on the emission intensity of the product, the applicable benchmark set by EU's Commission and the carbon price based on EU ETS.

CEREAL EXPORT PRICES US $ FOB PER TONNE 2019–2024/25

	2020 Oct Wk3 $	2021 Oct Wk3 $	2022 Oct Wk3 $	2023 Oct Wk3 $	2024 Oct Wk3 $	2025 Oct Wk4 $
US						
Wheat No 2 HRW	279	363	432	283	269	249
Corn No 3 Yellow (Gulf)	230	267	369	227	207	206
Sorghum (Nola)	293	297*	376	274	233	204
Soybean No 2 (Gulf)	456	502	603	507	408	434
Brazil (Paranagua)						
Corn (feed)	233	274	295	225	210	215
Soybean	500	521	601	485	421	449
Argentina (Up River)						
Wheat	283	300	426	311	244	215
Corn (feed)	228	250	310	246	210	206
Soybean	456	545	594	516	410	421
Thailand						
Rice White 5% broken	449	381	415	570	528	344
Vietnam						
Rice White 5% broken	477	428	424	635	533	362
India						
Rice White 25% broken	342	361	364	—	490	335

*+ Source: FAO IGC USDA-*Monthly avg - Sept; Rice Prices based on indicative quote*

In October '25 the EU published a further regulation for small traders to simplify the CBAM, whereby companies importing less than 50 tonnes annually will be exempt from CBAM obligations.

South Asia, Latin America to drive demand growth to 2028/29

Fertilizer affordability improved in the first half of 2025 compared to the previous eighteen months. Looking ahead the IFA

expect global fertilizer use to rise by 1-2% to 224mt N in 2028/29, an increase of 18mt N, though at a slower pace than in the past. South Asia and Latin America are expected to be the main engines of fertilizer demand growth between 2024/25 and 2028/29, each contributing an additional 4–5mt N demand over the period. South Asia is projected to drive demand for $P_2 0_5$ while Latin America to lead the growth in K_2O. Among the three main nutrients , nitrogen, phosphates and potash — potash is expected to grow the fastest with an annual growth rate of 2–3% compared to 1–2% for nitrogen and phosphate.

New capacity, gas affordability supports fertilizer output

Higher production levels were recorded in countries that have recently invested in new capacity, led by China, Russia, Iran and Nigeria. In Europe, improved natural gas affordability led to a 20% production rebound, driven in particular by Germany, the Netherlands, and Hungary.

Despite the reactivation of ammonia production in Bolivia, Latin American production declined by 9% for the second consecutive year due to plant shutdowns in Brazil and gas supply issues in Trinidad & Tobago and Mexico. Similar gas supply constraints also affected Egypt, Bangladesh, Algeria, and Iran. In Russia, urea exports remained strong while ammonia exports partially recovered but remained well below historical norms. The closure of Nutrien's operations on Trinidad and Tobago may further squeeze ammonia supplies and push prices higher.

GLOBAL NITROGEN SUPPLY/DEMAND 2022/23–2028/29 MT N

Fertilizer	2022/23	2023/24	2024/25	2028/29
Nitrogen capacity	180	192	195	216
Nitrogen supply*	156.9a	162.7a	165.9a	177.8a
Nitrogen demand	—	113.4	—	—
Fertilizer use	105.6	109	118	125
Other	—	—	—	—

*Source: FAO/ IFA-data N/t basis * effective capacity/derived capability [a]*

GLOBAL POTASH SUPPLY/DEMAND 2022/23-2027/28 MT $K_2 0$

Fertilizer	2022/23	2023/24	2024/25	2028/29
Potash capacity	—	64.0	64.3	77.4
Potash supply	46.7a	52.1a	53.8	59.8
Potash demand	—	—	—	—
Fertilizer	34.6	37.9	41	48
Potash balance	—	—	—	—

*Source: IFA - Data $K_2 0$ basis * effective capacity derived [a] capability*

Urea prices well above average

While low crop prices are impacting farmer affordability, urea prices spiked in August to $500/t FOB have since moderated due to renewed Chinese exports, which outweighed strong demand from India. Both India and China are key players in the global nitrogen balance — China's exports forecast to reach c.4mt in 2025, with a significant quantity to be exported in the last quarter. Strong Indian import demand, driven by low inventories, low domestic output, supporting global prices. Most market participants remained cautious into October, due to lack of clarity on potential fresh exports from China. From October onwards, urea price supported by sales to the EU, ahead of the implementation of the EU's CBAM on 1 January '26.

US to expand blue ammonia projects

The US is forecast to expand its ammonia capacity by 22%, primarily through blue ammonia projects utilizing Carbon Capture Utilization and Storage (CCUS). Major developments in the UAE and Qatar will also rely on this technology.

Electrolysis-based (green) ammonia projects attract interest

Electrolysis-based (green) ammonia capacity continues to attract investor

interest, but successful commissioning of projects is expected to remain limited over the next five years. IFA forecasts that 3.1mt N of green ammonia capacity will be commissioned by 2029, representing just 1.5% of global ammonia capacity. However, significantly larger volumes, close to 155mt N, are being tracked as under consideration for development beyond 2029, pending final investment decisions.

GLOBAL POTASH SUPPLY/DEMAND 2022/23-2028/29 MT K_2O

Fertilizer	2022/23	2023/24	2024/25	2028/29
Phosphoric acid capacity	—	64.0	64.2	71.7
Phosphoric acid supply	51.3a	54.3a	54.9	61.4
Phosphoric acid demand	—	—	—	—
Fertilizer	44.1	46.5	48	51
Phosphoric acid balance	—	—	—	—

*Source: IFA - Data K_2O basis * effective capacity derived [a] capability*

Future potash capacity to increase in Canada, Russia and Laos

The IFA expect potash capacity to increase by 20% between 2024 and 2029 reaching 77.4mt K_2O. Large-scale projects in Canada and multiple planned capacity expansions by existing producers in Russia and Laos.

North America and EECA are expected to lead this expansion.

Potash capability is projected to rise from 53.8 Mt K_2O in 2024/25 to 59.8mt K_2O in 2028/29 increase. North America and EECA are expected to lead this expansion. Large-scale projects in Canada and multiple planned capacity expansions by existing producers in Russia and Laos will be the primary drivers. Additional output is also anticipated from smaller projects in Spain, the Republic of Congo, and Thailand. After being relatively tight before 2023, the potash balance has since loosened and is expected to remain well-balanced over the next five years. The theoretically available surplus to remain relatively stable at 14% of supply capability in 2029. Potash prices are lower by $6/t after a 28-month high in August at $314/t. MOP demand has slowed in most major importing markets since July, with ample inventories likely to cover most demand for the rest of 2025.

Phosphoric acid growth driven by Africa, West & East Asia

Phosphoric acid capacity is forecast to grow by14% to 71.7mt P_2O_5 by 2029. Growth driven by Africa, West Asia and East Asia, with substantial additions projected in 2027 and 2028 — based on investments already under way, with new capacity to be developed by existing producers in Morocco, Saudi Arabia, and smaller expansions in Jordan, Egypt, and Tunisia. Capacity growth in China is due to rising domestic demand for non-fertilizer uses, mainly for the electric vehicles. All new phosphoric acid projects in China relate to purified phosphoric acid (PPA) capacity, in addition to merchant grade acid. Canada also has a major PPA project scheduled in 2028.

Global phosphoric acid supply/demand

Phosphoric acid supply is forecast to grow by 12% from 54.9mt P_2O_5 to 61.4mt P_2O_5 in 2028/29. Growth will be seen in Morocco, Saudi Arabia, China, and Canada. The increasing global demand for DAP and MAP fertilizers is a primary driver. Asia-Pacific is the largest market and the fastest growing region, driven by demand in China, India, and Southeast Asian economies. Other major producers include Morocco, Jordan, and the US.

In 2025, the global phosphoric acid production volume c.96.91mt. The market is expected to experience steady growth, driven primarily by strong demand for phosphate-based fertilizers and emerging applications in the new energy sector ($LiFePO_4$ batteries).

Clearing the way: tackling port bottlenecks today and preparing for tomorrow's fertilizer trade surge

The latest *Dry Cargo International*'s Global Fertilizer Trades feature highlights the rising price of fertilizers, amid a growing demand for grains and oilseeds, which shapes today's market, *writes Denis A. Ferreira, Senior Project Engineer, Jenike & Johanson*. Growing demand has created pressure points on production and logistics supply chains whereby ports are stretched to capacity, terminals are congested ahead of planting seasons, and vessel unloading is slipping into weeks rather than days. While these issues are usually reported in terms of increased freight rates and berthing delays, a major unstated cause is related to unreliable material handling. Many fertilizers are challenging to handle and their flow properties directly affect how quickly ships are loaded/unloaded, and port storage systems (e.g., hoppers, silos, storage halls) are filled/emptied.

For the engineering/consultancy firm Jenike & Johanson (Jenike), which specializes in bulk solids handling, the fertilizer trade represents both a challenge and an opportunity. Tackling today's port bottlenecks requires not only more berths and cranes but also smarter material handling solutions that make fertilizers flow more reliably, safely, and efficiently.

Current bottlenecks in ports & terminals

Worldwide ports handling fertilizers are under increasing strain. In West Africa, terminals in Lomé, Abidjan, and Lagos have struggled with limited berth space and slow ship unloading rates, often averaging 1,000–2,000 tonnes per day. The result is a backlog of vessels, higher demurrage, and uncertainty for importers working under tight seasonal windows.

In Brazil, ports such as Santos and Paranaguá routinely face bottlenecks when fertilizer imports surge ahead of the planting season. Ship turnaround times stretch well beyond planned loading or unloading periods, with ripple effects across the Supramax and Handysize freight markets. Export hubs in the Middle East have faced similar congestion, with waiting times at Bandar Abbas reported at nearly two weeks.

These operational difficulties translate directly into higher freight costs, uncertain CFR (cost and freight) pricing, and tighter margins for traders. While infrastructure expansion is a long-term fix, much of the congestion stems from an underappreciated factor: the way fertilizers behave as bulk solids.

Many blends are hygroscopic, prone to caking, and difficult to discharge from ship holds, silos, and hoppers. Flow stoppages, material buildup and dust emissions not only slow down unloading but can also

damage equipment, poise risks to workers, and compromise product quality.

Jenike's role in alleviating bottlenecks

This is where Jenike's expertise comes in. For 60 years, the company has specialized in diagnosing and solving flow problems in bulk materials, with fertilizers being one of the most technically demanding commodities. Jenike's approach begins by testing fertilizer samples in its laboratories (or, in some specific situations, on site) to characterize how they behave under different moisture, compaction, and temperature and relative humidity conditions. These results are then used to discuss projects involving storage bins, dump or port hoppers, feeders, and chutes to avoid commonly experienced flow problems of plugging, dust emissions, material buildup, caking, and erratic discharge.

One of the main reasons why many ports do not achieve the desired throughput is because they operate with equipment originally designed for different materials like coal, grain or ore. Fertilizers, however, have different flow properties and only relying on past projects and experience may limit operational efficiency. At terminals where Jenike has advised and worked with clients to eliminate flow problems, improvements in flowability have translated into measurable gains — vessel unloading times cut significantly, reduced demurrage costs, and more reliable, stable and predictable throughput. For traders and port operators, this reliability can make the difference between meeting seasonal demand or missing critical windows.

Looking ahead: preparing for future trade realities

Global fertilizer demand shows no signs of slowing. Import pipelines to Brazil remain robust, West African consumption is rising with agricultural intensification, and Asian producers continue to push exports. With fertilizer directly tied to food security, volumes are expected to climb steadily in the coming decade.

But growing trade comes with evolving pressures. Climate disruptions are causing more frequent weather delays at ports. Customs and inspection regimes, particularly in China, have added 7–10 days to vessel waiting times. Freight rates remain volatile, with energy costs and geopolitical tensions influencing availability of the Supramax and Handysize fleets, for example, that dominate fertilizer transport. For ports and terminals, the message is clear: today's handling systems will not be sufficient tomorrow. Scaling up isn't just about adding capacity — it's about ensuring that systems are designed for the unique properties of fertilizers from the outset. For example, scaling up the size of a poorly operating hopper and/or grab-crane unloading system will not guarantee improved flow reliability as the increased scale often induces worsening flow conditions.

Bulk solids do not flow like liquids whereby increased pressure increases flow; rather, the opposite phenomenon typically results in more pressure, reducing solids flow reliability.

Jenike's forward-looking approach addresses these future challenges head-on. By testing and modelling fertilizer flowability under different conditions, terminals can anticipate where bottlenecks might form and design resilient systems before problems arise. Computational modelling tools, such as Discrete Element Method (DEM), can be used to simulate performance of new or modified systems to ensure performance before any equipment fabrication commences. This design tool has been used in myriad industries, and is being applied to port unloading equipment on many new upgrade projects to ensure success. Scalable mass flow silos and optimized feeders and interfaces enable terminals to adapt to higher volumes without proportionally increasing delays. Just as importantly, smoother handling reduces energy use, limits dust emissions, and minimizes product degradation — offering sustainability benefits that align with tightening environmental standards worldwide.

Strategic recommendations

For operators seeking to stay competitive in fertilizer trade, a phased approach is recommended:

- **Short-term:** conduct a flow audit of existing handling systems to identify bottlenecks and inefficiencies.
- **Medium-term:** retrofit silos, hoppers, feeders and transfer chutes with measured flow properties to boost throughput rates and reduce dust emissions. Use DEM modelling to assess modification plan effectiveness and to evaluate a wide-range of operating conditions.
- **Long-term:** incorporate flow-based design principles into all new terminal expansions, ensuring systems are engineered for fertilizer properties from day one.

By blending immediate operational improvements with long-term design foresight, ports can transform fertilizer handling from a weak point into a competitive advantage.

Conclusion

The fertilizer trade is growing in both volume and complexity. Bottlenecks at ports are not just a temporary inconvenience — they are a structural challenge that threatens trade efficiency and profitability. Addressing these issues requires more than additional berths or cranes; it demands a fundamental rethink of how fertilizers are stored, moved, and discharged.

Jenike's expertise offers a pathway forward. By applying proven bulk solids handling science, ports and terminals can eliminate today's bottlenecks while preparing for tomorrow's trade surge. In doing so, the global fertilizer supply chain becomes more resilient, sustainable, and capable of keeping pace with the world's growing agricultural needs. DCi

Amer Shipping contracts Concordia Damen for CDS 110 Dry Cargo vessel

Concordia Damen has announced the signing of a newbuild contract with Amer Shipping for a CDS 110 Dry Cargo vessel. The agreement was formalized during the Europort exhibition in Rotterdam, where Concordia Damen joined several other Damen divisions to welcome clients and partners.

This latest order continues the successful partnership between the two companies, following the deliveries of the *AM Voyager*, *AM Explorer* and *Johannes Senior*. Each vessel in this series is based on Concordia Damen's in-house developed CDS 110 design — a proven concept optimized for efficiency, sustainability and reliable performance on the European waterways.

The 110-metre by 11.45-metre vessel features a shallow draught and high cargo capacity, ensuring reliable operations even during periods of low water levels. Its advanced hull form delivers low resistance, reduced fuel consumption and lower emissions, contributing to a significantly smaller environmental footprint.

As one of the Netherlands' most prominent inland shipping companies, operating a fleet of almost 60 vessels, Amer Shipping continues to invest in sustainable fleet renewal and in building sustainable partnerships across the supply chain with shippers, carriers and cargo owners. "We believe all stakeholders should play an active role in their own supply chain and that of its customers and partners," says Peter Buijks, co-owner of Amer Shipping.

"In transport, being able to provide a reliable service is key. That's why we manage maintenance, planning and technical support ourselves. But we can only do that if our fleet consists of high-quality vessels, and that's where Concordia Damen comes in. With the CDS Dry Cargo 110, we can actually transport 200 tonnes more cargo compared to other 110-metre vessels. Hence, this new CDS 110 supports our company's long-term vision to provide efficient, low-emission logistics solutions across Europe's inland transport network."

Concordia Damen looks forward to delivering this vessel and to continuing its collaboration with Amer Shipping in shaping the future of inland shipping.

About Concordia Damen

Concordia Damen's core business is to design and build inland waterway vessels with an innovative and cost-effective profile, primarily for customers in Western Europe and South America. It serves small and large (family-owned) shipping companies, as well as multinationals that are looking to optimize their transport logistics.

Down-to-earth management enables Concordia Damen to successfully build vessels worldwide, for example: Canada, Belgium, Denmark, France, Germany, the Netherlands and Paraguay.

Concordia Damen has delivered more than 270 vessels with different specifications, e.g. dry cargo vessels, tankers, pushers and river cruisers, and it has the capacity to go from 'simple, but effective' designs to full-fledged, zero-emission vessels with future-proof fuel and propulsion systems. High quality, innovative and efficient shipbuilding is the Concordia Damen trademark. It sees changes coming, understands what they mean and can thereby process them quickly and effectively in its services.

Combi Freighter news from Damen Shipyards

Damen unveils Combi Freighter 5000 ICE

Ice class vessel enables cost efficient, low emission ice class operations

Damen Shipyards Group has unveiled the latest platform in its successful cargo vessels portfolio. The shipbuilder announced the launch of the Combi Freighter (CF) 5000 ICE during the Europort 2025 event in Rotterdam. The approach Damen has taken is scalable. As such, the CF 5000 ICE is the first in a new series of ice class cargo vessels.

Efficient in open water, superior in ice

Commercial Director of Damen Cargo Vessels Remko Bouma explains the thinking behind the new vessel design. "Our aim has been to leverage the experience and the success we've enjoyed with our next generation cargo vessels to create a platform capable of economic ice navigation. The CF 5000 is equally at home in open water and in ice, maintaining both the optimal cargo capacity and high efficiency of the conventional vessel. As always, we have worked in close consultation with vessel operators, incorporating their input to create a practical, dependable vessel, suited to operations today and tomorrow."

Optimized design

The CF 5000 ICE draws on Damen's experience with the delivery of numerous next generation CF 3850 vessels, as well as the construction of conventional CF 5000 vessels. In the development of the latest vessel, however, Damen has optimized the design. This has involved a slight increase in the length of the hull, as well as the draught with the goal of increasing deadweight tonnage.

Though modest, the modifications have resulted in a considerable increase in cargo capacity. Damen is planning to implement these latest adaptations into the next generation of conventional CF 5000 vessels.

Cool operator

The CF 5000 ICE conforms to Swedish/Finnish Ice Class rules and can comply with the latest Finnish flag regulations. As such, the vessel offers space for high quality accommodation including sauna and gym facilities. The CF 5000 ICE features a comprehensive winterization package, suitable for its capabilities to operate in temperatures as low as –30°.

Rendering of Damen's Combi Freighter 5000 ICE.

Future-proof, green design

To retain the vessel's high levels of efficiency, the power required to operate on ice class is generated with a hybrid PTO/PTI system, as opposed to the vessel's main engine.

In this way, the vessel is able to operate on a relatively small, highly efficient propulsion system during regular options, receiving a boost in propulsion power, in a sustainable manner, only when required.

This is just one of the many features Damen has incorporated into the design to ensure sustainable performance. The vessel also features a number of options for battery installation and shore connectivity. Combining the use of the hybrid PTO/PTI with batteries allows for peak shaving, as well as sailing on full electric propulsion for short periods of time, for example in port or in environmentally sensitive areas.

Additionally, the CF 5000 ICE is able to sail on low emission biodiesel. Damen has also prepared the vessel for wind assisted propulsion. The vessel comes with the foundation for a ventofoil in place so that the decision to enhance sustainable performance can be quickly implemented.

The vessel will also feature access to Damen's connectivity solution, Triton. The award-winning IoT platform gathers data from sensors around the vessel, providing crew and fleet managers with regular system and asset health updates, and giving valuable insights into fleet and vessel performance. Additionally, Damen Triton eases maintenance tasks by giving the crew accurate instructions that help keep systems in optimal condition.

Lifelong support

Damen is planning to begin construction on the first CF 5000 ICE soon. The vessel is expected to be completed mid-2027, in time for winter that year. As with all Damen's CF vessels, the CF 5000 ICE is to be constructed in Asia. In this way, the vessels are built cost-efficiently, to Damen standards.

Following delivery, the company continues to provide support to its clients via the Damen Cargo Vessels aftersales and service team in the Netherlands. Comprised of experienced engineers and maritime service managers, the team maintains close contact with clients and their vessels to ensure warranty care as well as swift support in the event of an issue arising.

Damen delivers Combi Freighter 3850 'Holger G.' to Reederei Gerdes in Vietnam

On 7 October, Damen Shipyards Group delivered its latest Combi Freighter (CF) 3850 to family owned German shipping company Reederei Gerdes. The delivery of the vessel, named *Holger G.*, took place during a ceremony at the Bason Shipyard in Vietnam.

A proven workhorse

Damen's CF 3850 represents the latest generation in the shipbuilder's successful cargo vessel portfolio. The proven vessel design has been optimized for modern operations and features optimal efficiency and maximum cargo capacity. With its box-shaped hold, combined with multiple positioning options for the two grain bulkheads and tween deck, the vessel provides exceptional flexibility for transporting both bulk and breakbulk cargo.

Designed and engineered in Drachten, the Netherlands, and built to Damen's high standards in Vietnam, the CF 3850 comes

The Holger G. *Combi Freighter 3850 has been delivered to German shipping company Reederei Gerdes*

with full aftersales support from the Netherlands.

Long-standing co-operation

There is a longstanding cooperation between Damen and Reederei Gerdes, with Damen having delivered 11 to the company over the years. The latest delivery prior to this one was the CF 3850 *Helga G.* in July this year. In the development of its vessels, Damen has taken into account feedback from Reederei Gerdes, making design modifications to enhance onboard living and working conditions.

One of the family

Speaking during the delivery ceremony in Vietnam, Nicole Gerdes, Managing Director of Reederei Gerdes, remarked, "We have always believed a ship is more than a piece of steel — she becomes one of the family. That is why we are highly selective in choosing the vessels we build and the partners we work with. Damen is an international shipyard, yet it has preserved the essence of a family company. We see this in their approach to finding solutions. Even in difficult situations, Damen always works with us to find an outcome that is in everyone's best interest."

Remko Bouma, Commercial Director of Damen Cargo Vessels, commented, "We are proud to continue our collaboration with Reederei Gerdes, and we look forward to delivering the following two vessels currently under construction in Vietnam. Our trust in this partnership is strong, and we are committed to supporting each other throughout the process."

The vessels he mentions will be operated by over-C, a company founded as a partnership between Reederei Gerdes and Dennis Clavier. Over-C has specialized in coaster chartering across Europe for more than 20 years, building long-term customer relationships based on trust and reliability. The company combines deep market expertise with an openness to partnerships and innovation.

Damen Shipyards Group — Oceans of Possibilities

Damen Shipyards Group has been in operation for over 95 years and offers maritime solutions worldwide, through design, construction, conversion, maintenance and repair of ships and ship components. By integrating systems, it creates innovative, high quality platforms, which provide customers with maximum added value.

Core values are fellowship, craftsmanship, entrepreneurship and stewardship. Damen's goal is to become the world's most sustainable shipbuilder, via digitalization, standardization and serial construction of its innovative vessels and through use of circular materials.

Damen operates 35 shipyards and 20 other companies in 20 countries, supported by a worldwide sales and service network. It delivers in the region of 100 vessels per year, with a total production value of over €3 billion. Damen offers direct employment to approximately 12,500 people. In all that it does, its aim is to ensure a positive impact on the local environment and society.

Digital reporting transforms bulk shipping efficiency

Time-consuming daily reporting has long been a burden for bulk shipping crews and shore-based teams. But Paris-based maritime technology company Spinergie has made it its mission to transform the reporting process. With its Smart Fleet Management (SFM) platform, reporting is streamlined, data is processed and valuable insights are unlocked to help shipowners and operators create more efficient and cost-effective operations.

SFM is a single-entry reporting solution that replaces manual spreadsheets with automated, integrated workflows. The result is simpler operations for crews, cleaner data for managers, and faster decision-making on an individual vessel or fleet-wide basis.

From three forms a day to one

Leading global bulk cargo operator, SMT Shipping, faced a familiar challenge: excessive reporting requirements, ever-increasing due to regulatory compliance needs, were weighing heavily on their onboard teams. Each day, crew members had to fill multiple forms, often repeating the same information across different reports. This was both repetitive and increased the risk of inaccuracies slipping through the net.

With SFM now onboard a significant portion of their global fleet, the reporting process has been reduced to a single daily data entry. This change has had a positive impact on crew welfare, allowing them more time to spend on core tasks, while crucial internal and external reports are automatically generated using the combination of crew input and sensor data.

The solution's guided data entry, automated field population, and built-in quality checks have also improved reporting accuracy and eliminated the need for repetitive or frustrating data exchanges.

Reporting is faster while SFM has also reduced crew fatigue and created a tangible improvement in data quality.

Real-time fleet monitoring and streamlined operations

Asian Bulk Logistics (ABL) called on Spinergie to help them coordinate activities across their large, diverse fleet operating in remote transshipment zones.

They needed a single, reliable source that provided activity tracking, reporting, and performance monitoring, to bring together crews, project managers, and shore-based teams in real time.

SFM provided the visibility they needed through a live map powered by real-time AIS tracking and enhanced with weather and operational data. Using custom areas of interest, ABL's teams are alerted and aligned on key events such as vessels entering or leaving a site.

Like SMT Shipping, ABL has overhauled its reporting process using SFM, with the automated data flowing into analytics dashboards that track daily performance and longer-term trends. Their custom-built Cycle Dashboard calculates their operational key performance indicators (KPIs) allowing them to benchmark vessel performance, loading rates, and cycle times. This detailed insight has enabled ABL to recognize patterns, identify anomalies, and drive efficiency gains across their transshipment operations.

Reported data becomes intelligence

The experiences of both clients show how Spinergie's SFM solution bridges the long-standing gap between manual reporting and gaining meaningful insight from the vast amounts of data generated every day. SFM has replaced hours of paperwork with single-entry standardized data that frees crews to focus on operations, not administration.

For operations managers, the data flow is transformed into a powerful decision-making tool. Real-time dashboards highlight fuel use, voyage progress, and performance metrics, while historical analysis contextualizes these trends for future planning.

Spinergie has built SFM to adapt to the needs of the client with flexibility and integration. It connects seamlessly with existing systems and can be tailored to meet fleet profiles, cargo types and regional requirements.

Digitalization for the bulk shipping sector

Digital reporting is about so much more than regulatory compliance, it's the key to smarter, safer and more efficient shipping. By consolidating operational and vessel data into a centralized platform, SFM is helping dry bulk operators tackle some of their biggest challenges: heavy administrative workloads, inconsistent reporting, and the growing need for real-time visibility.

About Spinergie

Founded in 2016, Spinergie is a maritime technology company that combines data intelligence with deep operational expertise. Its SFM platform helps offshore, transshipment, and bulk operators simplify reporting, improve data accuracy, and gain actionable insights across global fleets.

UK P&I Club and TT Club announce merger discussions

The UK P&I Club and TT Club have worked closely together for many years through their common manager, Thomas Miller. At their meetings in November, the Boards of both Clubs agreed to explore the possibility of cementing this existing relationship through a potential merger.

The merged Club would have a unique breadth of expertise across the maritime and transport industry and bring together complementary strengths to enable an enhanced and integrated service to Members whilst meeting the evolving needs of the industry.

The strategic visions of the UK P&I and TT Clubs are closely aligned, in each case they are focused on providing exceptional service to Members, delivering growth, efficiency and improving financial stability. Both Clubs are highly respected in their own markets and combining the two accelerates progress towards their shared strategic goals. The combined Club will be uniquely positioned to support its Members, and the broader maritime and transport industries, in addressing the challenges and opportunities of the future.

Discussions remain at an early stage and will continue over the coming months.

Steelpaint partnership with BW Epic Kosan underscores importance of zinc primers in protecting structural steel

As shipowners look for coatings that shorten docking time and extend maintenance cycles, BW Epic Kosan's continued preference for Steelpaint's corrosion-protection technology highlights the growing confidence in zinc-based polyurethane systems to keep vessels structurally sound.

Since receiving its first order in 2017, Steelpaint has regularly supplied its Stelpant-PU-Zinc coating for application to the hulls and decks of BW Epic Kosan's global fleet of gas carrier. The most recent delivery was shipped two weeks ago for application to the 11,000 m³ LPG carrier *Epic Sunter*, which is scheduled to drydock in the United Arab Emirates.

Several vessels have now completed two or three drydocking cycles with the same coating system performing effectively, requiring only small-area touch-ups rather than full recoating.

"Repeat orders from the shipowner reflect long-term satisfaction with Stelpant's corrosion resistance and the confidence BW Epic Kosan places in the system to safeguard its vessels," said Steelpaint Director Frank Müller.

The single-component, moisture-curing polyurethane zinc primer is applied to hull areas from the boot-top to the railing and on exposed deck structures to prevent corrosion and maintain steel integrity.

"Epic Kosan's fleet operates in some of the world's most demanding marine environments, with vessels routinely exposed to saltwater and extreme temperature cycles," Müller said. "The shipowner's continued confidence in Stelpant-PU-Zinc underlines the system's proven durability in extending asset life and reducing maintenance downtime.

The zinc-rich formulation provides cathodic protection with deeper penetration into the steel substrate while retaining elasticity throughout its service life, preventing cracking and sub-film corrosion.

Dmitry Gromilin, Steelpaint's Technical Manager, said the coating's characteristics have proven decisive in the operator's decision to standardize the product. "The obvious advantages of both the application process and the unique formulation of this coating demonstrate that our customers' decisions are economically, environmentally and technologically sound," he said. "Shipowners using this system typically find that repair and touch-up areas are much smaller than with traditional epoxy coatings."

Stelpant-PU-Zinc has now been applied to numerous Epic Kosan vessels during scheduled drydockings in Europe, the Middle East and Asia, where the coating has been used either as a stand-alone primer or within hybrid systems combining Steelpaint's zinc base with alternative topcoats selected by the owner.

"We've used Steelpaint coatings across a large part of our fleet for several years and have been very satisfied with the results," said Niraj Singh, Chief, Tech/Sci and R&D Manager, BW Epic Kosan. "For us, a key measure of any coating is how it performs over time. With Stelpant-PU-Zinc, we've consistently seen smaller repair areas and less surface degradation between dockings. The product has helped us reduce downtime while maintaining high structural standards across our fleet."

Gromilin said the success of the Epic Kosan programme shows how high-performance polyurethane zinc primers can integrate with existing specifications without disrupting owners' maintenance routines.

"Many shipowners appreciate the flexibility of a single-pack primer that can be applied quickly in varying climatic conditions," he said. "It cures rapidly and provides long-term protection in aggressive marine and industrial environments. Combined, these benefits deliver measurable savings over traditional multi-component epoxies while maintaining the high corrosion-protection standards required by classification societies."

Müller added that the partnership with Epic Kosan reflects the long-term value Steelpaint systems bring to ship maintenance. "Consistent performance, ease of application and proven lifecycle value directly reduce operational expenditure," he said.

"This collaboration demonstrates how the right coating technology can make ship maintenance faster, safer and more sustainable."

About Steelpaint GmbH

For more than 40 years, Steelpaint has enhanced the life and durability of heavy-industry facilities, particularly in the maritime sectors. Thanks to one-component polyurethane resins, the Germany-headquartered company's special high-tech coatings have raised the technological bar in corrosion resistance, offering impressive benefits over conventional epoxy coatings solutions.

Steelpaint has origins dating back to the 1890s. Its products are used widely in port and offshore facilities, sheet pilings, internal and external linings, tanks, bridges, and ship structures. They can be used in combination with cathodic protection.

Anemoi completes Rotor Sail installation on NS United VLOC bulk carrier

Anemoi Rotor Sails on NSU Tubarao *at Zhoushan Xinya Shipyard.*

Fourth VLOC installation of Anemoi Rotor Sails

Anemoi Marine Technologies, the UK-based prominent designer of Rotor Sails for wind-assisted ship propulsion, has completed the retrofit on another of the largest vessels in the world, after installing five 35m-tall units on the 400,000dwt ore carrier *NSU Tubarao*. The vessel, owned by bulk owner/operator NS United Kaiun Kaisha, Ltd. (NSU) and chartered by mining giant Vale International*, is expected to reduce fuel consumption by 6–12% annually using the wind-assisted propulsion system. This marks the fourth VLOC installation of Anemoi Rotor Sails on vessels chartered by Vale*.

The completion of this installation means Anemoi has surpassed 1.6 million dwt of vessel tonnage installed with Anemoi Rotor Sails.

The Rotor Sail installation on the five-year-old vessel, currently operating under a long-term charter to transport iron ore for Vale, was completed during scheduled drydocking in October in Zhoushan Xinya Shipyard Co.,Ltd, China. The Rotor Sails are deployed using a folding (tilting) mechanism for flexibility during cargo handling.

NSU has taken a cutting-edge approach by combining Rotor Sails with advanced digital solutions that optimize power usage and vessel routing, enhancing fuel efficiency on *NSU Tubarao* and maximizing the use of wind energy. Manta's FuelOpt offers flexibility to the owner for power management of the main engine, including optimization of fuel saved by the Rotor Sails. Coupled with NAPA's Voyage Optimisation toolbox for voyage planning to maximize the benefits of favourable winds without compromising departure or arrival times.

During the scheduled special survey, *NSU Tubarao* was also equipped with a new shaft generator designed to enhance the efficiency of the vessel. This upgrade not only improves the vessel's own energy performance but also optimizes fuel consumption when operating Anemoi's Rotor Sails. Anemoi successfully integrated its Rotor Sail technology with the vessel's shaft generator through advanced control system integration, ensuring seamless co-ordination between wind propulsion and onboard power supply. NSU's forward-thinking approach to sustainable innovation means this installation stands among the most efficient wind propulsion retrofit projects to date.

"The scale of this project shows the market's growing confidence in wind power as a crucial enabler of lower emission shipping. Working with progressive partners like NSU, Vale and Class NK, we are able to advance Rotor Sail technology and show how optimizing propulsion integration and navigation for wind assistance can deliver even greater benefits," says Clare Urmston, CEO of Anemoi.

"At NSU we aim to support our stakeholders with the world's most efficient ships. The Rotor Sails on *NSU*

Focused on adopting and leveraging technologies and fleet modernization to reduce GHG emissions, Vale is committed to supporting the maritime industry in achieving the International Maritime Organization's (IMO) decarbonization targets. Aligned with the ambition of the Paris Agreement, Vale also has a target of a 15% reduction in scope 3 emissions by 2035, related to the value chain, of which shipping emissions are part, since the ships are not owned by the company.

Tubarao, and the advanced systems that will help maximize its fuel-saving potential, are a perfect example of those efforts. We are pleased to have completed this successful installation, within the scheduled drydock, by strong collaboration of both Anemoi and the NSU team," adds Toru Fujita, Director, Managing Executive Officer of NSU.

NSU Tubarao is a 361m length overall, 65m beam very large ore carrier delivered in September 2020. With a deadweight tonnage of 399,717, it is amongst the largest bulk carriers in the world. The five Rotor Sails onboard measure 35m tall and 5m in diameter, designed to maximize the magnus effect that provides lift and thrust to significantly reduce engine propulsion demand in order to sail at a given speed.

Clare Urmston, CEO — Anemoi Marine Technologies.

About Anemoi Marine Technologies

Anemoi Marine Technologies is a major provider of Rotor Sail wind propulsion systems for the global shipping industry. Its patented technology harnesses wind power to significantly reduce vessel fuel consumption and emissions, including CO_2, SO_x, and NO_x. Its cutting-edge Rotor Sails deliver significantly higher thrust per square metre than conventional sails, offering a compact, high-performance solution for sustainable shipping. With over 15 years of R&D and proven commercial installations across various vessel types, Anemoi's systems are designed for both newbuild and retrofit applications. Approved by leading classification societies, Anemoi's solutions support compliance with key regulations such as EEDI, EEXI, CII, EU ETS, and FuelEU Maritime — advancing the transition to cleaner, more efficient maritime transport. DCi

Anemoi Rotor Sails on NSU Tubarao *at Zhoushan Xinya Shipyard.*

Enhanced activity in the Handymax freight market

Richard Scott, Bulk Shipping Analysis

In the world fleet of Handymax bulk carriers operating within the dry cargo freight market, the deadweight tonnage of vessels looks set to have grown by about a fifth over a period of five years by the end of 2025. This growth, in a segment comprising about a quarter of the entire bulk carrier world fleet, reflects a trend of increasing activity in seaborne trade movements associated with the vessel size involved and solid demand for the commercial services provided.

Offering a carrying capacity of between 40,000 deadweight tonnes and 70,000dwt, Handymax bulk carriers are medium-size dry cargo vessels — mainly geared (incorporating cargo handling equipment on board) — participating in many dry bulk commodity trades. Sub-categories within the size group are the Supramax and Ultramax vessels, which successively gained most attention from shipowners and charterers.

Shipowners' optimism about longer term growth in relevant global trades has been embodied in investment in Handymax bulk carrier newbuildings, concentrated within the Ultramax group of larger vessels in recent years. Potential for fleet renewal has augmented confidence in ongoing employment prospects as a motivation for ordering new ships.

Opportunities for replacing existing ships with tonnage of greater efficiency, fuel economy and lower emissions enhanced the popularity. Varied and extensive employment on numerous routes seems likely to continue. Steady, robust world fleet growth of 3–4% annually reflected the attraction.

Benefits of versatility

Handymax bulk carriers are designed to provide distinct attributes which are valuable in their normal trading patterns. A typical ship of this type is described as a 'geared' vessel (including cargo-handling gear installed), usually equipped with cranes and grabs for loading and discharging cargo. This characteristic is evident in all the sub-categories of ships within the broad Handymax size group, the larger sizes of which are supramax and ultramax vessels.

By contrast, bigger capacity units within the bulk carrier fleet as a whole — Panamax, Kamsarmax, Capesize and Newcastlemax bulk carriers — usually are 'gearless' with no installed cargo-handling equipment on board. Such vessels are totally dependent on loading and discharging equipment at port facilities.

HANDYMAX (40–69,999DWT) BULK CARRIER FLEET (MILLION DEADWEIGHT TONNES)

	2020	2021	2022	2023	2024	2025*
Newbuilding deliveries	9.2	7.0	7.3	9.4	10.5	12.5
scrapping (sales)	1.7	0.7	0.4	1.6	0.8	1.0
losses	0.0	0.1	0.0	0.0	0.0	0.0
plus/minus adjustments	0.0	0.0	0.0	0.0	0.0	0.0
fleet at end of year	**214.6**	**220.5**	**227.3**	**235.1**	**244.8**	**256.5**
% change from previous year-end	+3.6	+2.9	+3.1	+3.4	+4.1	+4.8

source: Clarksons (historical data) & BSA 2025 forecasts **forecast*

One especially apparent advantage of a geared vessel is that its equipment allows efficient operation in trades where shore-based facilities at ports are either unavailable, or inadequate. Handymax gear also often assists handling cargo from or into barges moored alongside, at an offshore anchorage or mid-river berth.

Also, an advantage offered by Handymax ships is that dimensions — length, beam and draught — are suitable for a wide range of ports around the world, on most trade routes. Many of these ports are inaccessible for bigger ships. In addition, Handymax carrying capacity offers some economies of scale. Varied employment patterns occur as a result. Frequently there is involvement in the coal as well as grain and soya trades. Numerous cargoes in the minor bulk commodity trades are prominent. Steel products, ores and minerals such as nickel ore, other industrial commodity cargoes, fertilizers and various agricultural commodities including oilseeds and meals are regularly carried.

During the past decade shipowners' preferences for new vessels, to be employed within these trades, firmly shifted towards higher capacity ultramax 60–69,000dwt bulk carrier designs at the top end of the Handymax size range. Previously the Supramax, typically 52–57,000dwt, was the preferred unit, taking over from smaller Handymaxes below 50,000 dwt in an earlier era.

Fleet expanding solidly

Over recent years a moderate growth pace unfolded in the world fleet of Handymax size (40–69,999dwt) bulk carriers. As shown in table 1, this group's deadweight capacity increased by an average 3.4% annually in the five years from 2020 to 2024, including 4.1% in the most recent 2024 year. Within the current year, 2025, an accelerated pace is foreseen, followed by perhaps slower growth next year based on assumptions about newbuilding deliveries and scrapping.

Handymax fleet capacity reached 244.8m dwt (million deadweight tonnes) at the end of 2024 according to Clarksons Research data. The number of vessels in this size group then was 4,295. This total comprised about 24% of the entire 1,035m dwt world bulk carrier fleet of all vessel sizes. Among the Handymax vessels, Supramaxes comprised half of the deadweight capacity at 49%, while Ultramaxes comprised 40%.

During the 2025 first nine months the Handymax fleet has been augmented by a net addition of about 9m dwt or 4%, boosting the total to 4,430 ships amounting to 253.5m dwt at end-September. Newbuilding deliveries rose while scrapping remained at low levels.

In the past three years Handymax bulk carrier newbuildings delivered to owners, by shipbuilding yards around the world, have been on a rising trend. The annual average deliveries total over five years from 2020 to 2024 was 8.7m dwt, resulting in a total of 43.4m dwt added. In 2024, the annual volume was 10.5m dwt. Scrapping of mainly older vessels offset a small part. Demolition sales totalled 5.2m dwt in the past five years, including minimal volumes of under 1m dwt in each of three years in the period, including 2025 at 0.8m dwt.

Changing fleet composition is a notable trend within the Handymax segment. Large differences between the size of newbuildings delivered into the fleet, and the size of old ships sold for demolition is a feature. In 2024 newbuildings averaged 62,500 dwt, confirming the popularity of ultramaxes towards the top end of the Handymax size range. By contrast ships sold for recycling averaged 44,400 dwt, with an average age of 30 years, representing an earlier era when the original Handymax bulk carrier of 40-50,000 dwt size was most popular.

Within 2025 as a whole newbuilding Handymax deliveries are set to exceed last year's volume at around 12.5m dwt based on provisional calculations. Estimates are based upon the pace so far, coupled with expectations for the remaining weeks. The scrapping volume may be above the past year's level, reflecting influences including freight market performance, sentiment and second-hand prices, and the annual total could be around 1m dwt. Although the year-end is approaching, it is still difficult to calculate these elements precisely because there is potential for unforeseen changes to emerge.

More enlargement ahead

On the basis of tentative indications, prospects for fleet growth in 2026 point to the pace decelerating after the brisk pace this year. Newbuilding deliveries, mainly reflecting shipyard orderbook schedules for ships which were ordered some time ago, could decrease. Meanwhile, scrapping may be somewhat higher.

Fleet evolution is hard to predict

HANDYMAX (40–69,999DWT) BULK CARRIER ORDERBOOK (MILLION DEADWEIGHT TONNES)

SCHEDULED ORDERBOOK DELIVERIES, NOT FORECASTS OF ACTUAL DELIVERIES

	4q2025*	2026	2027/later	total
40–49,999dwt	0.1	0.2	0.3	0.6
50–59,999dwt Supramax	0.4	0.6	0.6	1.6
60–69,999dwt Ultramax	3.0	11.0	11.6	25.6
Total	**3.5**	**11.8**	**12.5**	**27.8**

source: Clarksons Research & BSA estimates **fourth quarter of year*

NORDEN signs two-year contract with US wood pellet producer

NORDEN has signed a two-year Contract of Affreightment (COA) with Enviva to transport a significant volume of wood pellets from the United States to Europe over a two-year period, commencing in 2026.

Enviva is the world's largest producer of wood pellets, helping to reduce reliance on fossil fuels around the globe with production across the southeastern US. The contract builds on NORDEN's long-term partnership with Enviva and expands the co-operation between the two companies.

The agreement is an extension to the COA that NORDEN has been executing since 2012.

NORDEN CEO, Jan Rindbo, comments: "Enviva is a valued customer to NORDEN. We are pleased that our relationship and performance with Enviva has ultimately led to their decision to extend the contract with us. Our collaboration with Enviva allows us to once again deliver wood pellet products, thereby contributing to delivering sustainable energy products to customers across the Atlantic."

HANDYSIZE VESSELS

Length:	170–185 metres
Width:	27–31 metres
Wood pellet cargo capacity:	27,000–33,000 metric tonnes

During the two-year contract period, Norden will transport multiple Handysize shipments with loading on the east and gulf coasts of the United States to Enviva's customers in the UK and Europe.

because uncertainty surrounds both future inflows and outflows of tonnage. Orderbook schedules provide a foundation for estimating deliveries with some degree of confidence, but such schedules are not always a reliably accurate guide. Scrapping activity will continue to reflect evolving freight market patterns, secondhand and scrap prices, and market sentiment and expectations, the net impact of which is often unforeseeable and may change.

Current global orders for new Handymax bulk carriers are set out in table 2, showing the schedule for newbuilding deliveries over the next twelve months and further ahead, as compiled by Clarksons Research. However, these reported orderbooks at shipyards are only a rough guide to the amount of future fleet capacity likely to be added within any given period. Orderbook slippage and postponements, usually difficult to predict, can occur while more orders could be added.

The current Handymax orderbook for vessels scheduled to be completed in all future delivery years now totals about 28m dwt, equivalent to 11% of the existing world fleet in this size group. Most of the deadweight capacity on order (92% of the total) consists of Ultramax vessels, emphasizing how these ships have become the dominant investment focus for owners.

Ideas about the outlook for the freight market and profitability affect decisions to invest in new ships, in the bulk carrier sector as a whole and in Handymaxes in particular. Orders for Handymaxes rose strongly in the past few years, but the pace has diminished abruptly during this year, apparently reflecting renewed caution about how the future may evolve.

Shipowners' views about future fleet trends evidently have become more cautious, amid doubts about longer term freight market prospects, causing hesitation in ordering new ships. Available building berths at shipyards also appear to be more constrained. Moreover, the effects of tightening international regulation of shipowning operations and, especially,

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surrounding the intensified focus on cutting ships' greenhouse gas emissions, are still unclear. The availability of, and technology for, alternative fuels facilitating decarbonization, suitable for the entire lifetime of a typical new ship, is still being developed. Consequently fleet growth may remain restrained.

Scrapping (recycling) volume variations are another imponderable for fleet growth forecasts. This influence is especially hard to predict, both in the immediate future and further ahead. The likely future course and impact of changes in secondhand vessel prices and scrap prices is usually unclear. Owners' views of current and expected freight market trends are among unpredictable influences, while regulatory aspects have become more prominent.

It seems abundantly clear nevertheless that there is much potential for scrapping older Handymax tonnage. Currently 12% (about 31m dwt) of the world fleet is 20 or more years old, an age group where recycling is more likely. Tonnage in the 40–49,000 dwt and 50-59,999 dwt size subgroups together comprises almost all of the 20+ years old total. Tightening regulations and compliance costs coupled with the general ageing process could encourage extra sales to demolition yards. Higher scrapping is therefore predictable after recent minimal volumes, acting as a restraint on the deadweight capacity expansion of the fleet in 2026 and beyond.

Trading pattern features

Analysis of global trading patterns performed confirms that a high proportion of dry bulk commodity movements is accessible to Handymax bulk carriers, with relatively few limitations. The dimensions and cargo-handling capability of typical ships facilitates their employment, carrying a wide range of commodities in most geographical areas.

But, in practice large parts of global long-haul iron ore and coal movements do not normally employ Handymaxes. Bigger Panamax, Kamsarmax, Capesize, Newcastlemax and even larger bulk carriers can be accommodated on many of these routes. The higher-capacity vessels enable greater economies of scale to be derived, providing cheaper transport.

A rough guide to the significance of various trades, for Handymax 40–70,000 dwt size bulker employment, suggests that over half of the total trade volume carried is in the extensive and diverse minor bulk commodities segment. The iron ore and coal trades perhaps each contribute up to one-tenth of total employment. Grain and soya trade contributes about one-fifth.

Diverse cargoes

One of the most prominent among the many commodities carried by Handymax bulk carriers, providing many cargoes and substantial employment, is grain and soya trade. This category experiences a continuously changing pattern of routes and quantities, and is highly variable in both the short and longer term. It also tends to be largely unpredictable. World trade in wheat and coarse grains, together with soyabeans and meal, recently saw a reduction but in the current period an upturn is tentatively predicted.

Calculations derived by Bulk Shipping Analysis from recent US Department of Agriculture data show global trade in grain and soya during the 2024/25 trade year ending third quarter 2025 estimated at 691mt (million tonnes), a decline of 24mt, or 3%. The total includes land movements but is mostly seaborne. Lower imports into the largest individual importing country, China, where a fall of 44mt (25%) to 130mt occurred, was the main feature.

Harvest output fluctuations often contribute to large rises or falls from year to year, in volumes of grain or soya available in exporting countries, and quantities required in importing countries. Output changes are frequently caused by unpredicted weather variations. This characteristic requires flexible shipping capacity. Employment opportunities for Handymax bulk carriers are also enhanced by port and storage limitations in many countries, restricting the cargo size that can be accommodated.

For the 2025/26 year now beginning, estimates of world grain and soya trade point to a recovery of about 31mt (5%) to 722mt, based on calculations using recent USDA data. A large part of the annual increase is expected to be caused by a revival of China's imports. These are forecast to increase by 16mt (13%) to 146mt, reflecting higher wheat, corn, barley and soyabeans purchases by Chinese importers. Volumes received by a number of other Asian buyers also may be higher.

A large part of Handymax bulk carrier employment is formed by carrying cargoes within the 'minor dry bulk trade' category. Some individual elements of this group are not actually 'minor' but amount to massive annual volumes. The commodity range is broad and in the past few years the overall world movements total has been estimated at 2,200mt to 2,300mt annually. After a decrease in 2022 the past two years saw resumed growth.

Steel products (coil, sheet, plate and other items), and forest products, are the two biggest trade components among minor bulk commodities, although large quantities are not carried by bulk carriers but by other vessel types. Substantial volumes are contributed by bauxite/alumina (aluminium raw materials), fertilizer raw materials and semi-finished fertilizers. Other big components are agricultural commodities; sand, stone and aggregates; and cement trades. These are accompanied by quantities of ores such as nickel and manganese, and steel scrap.

Manufacturing and construction,

together with agricultural activity, determine many movements of minor bulk commodities. In 2024 estimates based on Clarksons Research calculations indicate an overall seaborne trade increase of 3% in this segment, to 2,370mt, following an increase in the previous year. Changes in individual commodities were mostly positive last year, in both the industrial and agricultural bulks categories. During 2025 as a whole, indications suggest that a similar overall advance could occur.

Numerous routes in the coal segment chiefly employ Panamax and Capesize ships, but Handymax cargoes amount to big volumes, especially on specific trade routes. Global seaborne coal trade is the second largest commodity trade employing bulk carriers (after iron ore), and amounted to 1,380mt in 2024. Coal still comprises almost one quarter of all global dry bulk cargo movements, despite environmental restraints affecting consumption in many regions.

Last year coal trade continued expanding after strong growth in the preceding twelve months. Seaborne movements comprise steam coal (used chiefly in power stations, also in other industries), and coking coal (used in the steel industry). Steam coal is the dominant component, contributing four-fifths of the total. During 2024 the main positive global coal trade import element was China, contrasting with reduced European volumes.

Coal trade is experiencing a large reversal of China's trend in 2025, which seems unlikely to be offset by positive changes elsewhere. Together with import reductions in India and other countries, global seaborne coal trade is likely to decline. Looking further ahead the global shift towards cleaner energy sources is exerting downwards pressure on fossil fuels, including coal consumption, and it will be a restraining influence on coal import demand in many countries.

An evolving market

As outlined in the preceding section, the Handymax freight market has been supported by growing volumes in some global commodity trades over the past twelve months, although the picture has not been uniformly positive and in other trades reduced activity occurred. There is provisional evidence of a continued pattern of longer voyage distances in a number of trades, strengthening the tonne-mile measurement of demand for bulk carriers.

On the supply side of the market demand/supply balance, Handymax bulk carrier world fleet capacity has been growing briskly during this year amid an increased volume of newbuilding deliveries only partly offset by a sustained depressed scrapping level. The main uncertainty about effective capacity progress, as usual, surrounds how productively the fleet is used. Influences such as annual changes in vessel average speed, incidence of ballast voyages and port visit durations potentially affect carrying capacity provided.

Looking at prospects for the Handymax freight market in the twelve months or so ahead, many of the determining factors are somewhat opaque. Typically it is difficult to predict the trajectory of relevant dry bulk commodity trades and vessel employment and, as is often seen, there are doubts about several aspects. In particular import demand from China (almost 40% of global dry bulk commodity seaborne trade) may cease growing or diminish, while imports into the remainder of the world are not yet showing signs of substantial enlargement.

The Handymax fleet outlook suggests that a deceleration in growth is quite likely, reflecting both lower newbuilding deliveries and increased scrapping. This slowing tendency could assist in supporting the Handymax freight market through 2026. DC

ARDELT delivers crane to Rhenus Weserport

ARDELT delivers major crane to Rhenus Weserport — a milestone after the company's restart

At the end of October, ARDELT successfully handed over a new Tukan K double-jib luffing crane to Rhenus Weserport. The crane will operate continuously in steel plant service, unloading a wide range of vessels, and is designed for maximum availability, efficiency, and durability.

With a lifting capacity of up to 63 tonnes and a maximum outreach of 55 metres, the new Tukan K ranks among the largest cranes in ARDELT's current portfolio. Its robust structure and precise control system ensure top handling performance even under demanding conditions. Thanks to its integrated bunker system, the Tukan achieves a handling capacity of up to 2,300 tonnes per hour, seamlessly integrating into the plant's conveyor systems.

The successful handover marks an important milestone: ARDELT has once again demonstrated its ability to design, manufacture, assemble, and commission complex harbor cranes on schedule and to the highest quality standards. After restarting in 2023, ARDELT has since grown to more than 70 staff and developed into a highly specialized medium-sized company with a global focus.

Today, ARDELT's mission is to meet highly specific customer requirements and set new standards in modern harbour crane construction.

Tender issued for Guaymas minerals terminal

The National Port System Administration (Asipona) for Mexican ports has issued a tender for the operation of a bulk minerals terminal in the Port of Guaymas. On offer is a 15-year contract for the use, exploitation and operation of the facility, with an option to extend these rights for up to 15 additional years.

The public terminal, which is located in the central area of the Guaymas port complex, covers 28,416m^2, including a covered storage area of 10,580m^{2}s and an open-air stockpile of 17,836m^{2}s. *Barry Cross*

TMG boosts environmental credentials

At the Spanish Mediterranean Port Castelló(n), terminal operator Terminal Marítima del Grao (TMG) has acquired a raft of new environmentally friendly equipment for the handling of dry bulk. An eco-friendly hopper and a conveyor belt system have recently been inaugurated at a new warehouse, where they provide a cleaner and safer working environment.

The new hopper has a capacity of 110m^3, and is equipped with an advanced truck unloading system that uses hydraulically operated opening and closing nozzles. In addition, it benefits from a lighting system allowing operations in low-visibility conditions, plus a dust particle retention mechanism that minimizes dispersion into the environment.

As for the 35m-long conveyor belt, it can lift commodities to a maximum height of twelve metres, thereby facilitating faster and cleaner handling of loads.

Both the hopper and conveyor system are self-propelled and mobile.

These new initiatives absorbed investment of €1.2 million, and form part of TMG's long-standing environmental strategy. The company already has in operation semi-enclosed buildings that guarantee zero particulate emissions, built at a cost of €5.5 million.

Future plans include the provision of both a second hopper and a second conveyor belt of the same specifications. *Barry Cross*

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DP World subsidiary acquires controlling stake in NACC

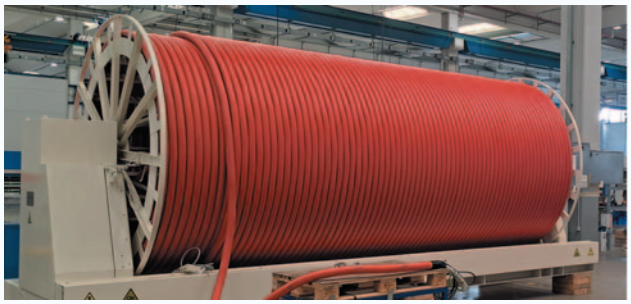
P&O Maritime Logistics (POML), which is a wholly owned subsidiary of DP World, has completed the acquisition of a controlling stake in NovaAlgoma Cement Carriers (NACC). However, the transaction excludes NACC's interests in joint ventures in Northern Europe, Indonesia and Greece.

Of note is that current shareholders, Nova Marine Holding SA (Switzerland) and Algoma Central Corporation (Canada), will retain a significant minority stake in the company. In addition, NACC's current operational leadership will remain unchanged, although strategic oversight will be provided by P&O Maritime Logistics.

NACC is the world's leading operator of pneumatic cement carriers, having been granted all the necessary regulatory approvals on 3 July 2025. It was founded in 2016 as a joint venture between Nova Marine Holding and Algoma Central Corporation, and specializes in the global transport of dry bulk cargo. However, it concentrates mainly on moving cement, and uses modern vessels equipped with advanced pneumatic systems. It is active in North America, Europe, the Mediterranean, South Asia and the Caribbean.

Barry Cross

Cavotec signs motorized reel order for Port Hedland in Australia



Cavotec has signed a contract with Australian construction and engineering company Civmec for the supply of a motorized cable reel to be installed at Port Hedland, Western Australia, one of the world's largest iron ore export facilities.

This marks Cavotec's first major collaboration with Civmec, further strengthening Cavotec's presence in Australia's mining and bulk material handling sector. Delivery is scheduled for the third quarter of 2026.

Cavotec was awarded the project based on its strong track record in providing innovative and durable reeling solutions for balanced machines in the Australian market.

"This order underscores Cavotec's capability to deliver robust, high-performance solutions for some of the most challenging industrial environments in the world," said David Pagels, CEO of Cavotec. "We are proud to support Civmec in this project, and we look forward to building a long-term partnership."

About Cavotec

Cavotec is a leading engineering company with 50 years of heritage in innovation, design, and delivery of advanced connection and electrification solutions that drive the decarbonization of ports and industrial applications. With five decades of experience, our systems ensure safe, efficient, and sustainable operations for a diverse range of customers and applications worldwide.

Reconstruction of Argentina's Rosario River Terminal dock begins

With a productive and sustainable vision, the Province of Santa Fe, Argentina, is moving forward with a key intervention for the port, tourism and urban development of the region.

With an investment from the Government of the Province of Santa Fe, the reconstruction of the dock at the Rosario River Terminal has begun, a long-awaited project that will allow the recovery of an emblematic space in the city and strengthen the port infrastructure of Santa Fe.

The project, promoted by the Ministry of Productive Development of Santa Fe and the Rosario Port Authority (ENAPRO), is part of the comprehensive port development plan being carried out by the administration of Governor Maximiliano Pullaro and Vice Governor Gisela Scaglia, with the aim of improving connectivity and strengthening Rosario's relationship with its riverfront.

During the contract signing ceremony, the Secretary of Transportation and Logistics, Mónica Alvarado, emphasized the political decision to implement a comprehensive solution. "It will be a beautiful promenade, a window to the river, a continuation of the enjoyment of our riverfront, with a sustainable approach, urban amenities, LED lighting, but the important thing is ... the work that involves a new structure; it is a truly significant engineering project," she stated.

For her part, the president of ENAPRO, Graciela Alabarce, highlighted that "this is the first major project undertaken at the River Terminal since its creation 70 years ago," and added that the infrastructure enhances its value and opens the door to new possibilities, complementing the renovation of the terminal's Convention Center.

The project, in addition to its symbolic and urban value, is part of a provincial strategy to strengthen logistics and port infrastructure, which includes projects such as the third lane between Rosario and San Lorenzo, the projection of the port system towards Timbúes and the promotion of new public and private investments.

With this intervention, Rosario will recover a meeting point with the river and a new space for tourist, cultural and productive development, reaffirming the commitment of the Government of Santa Fe and ENAPRO to sustainable growth and territorial integration.

CRS eyes new opportunities for 2026

The container bulk handling (CBH) industry is witnessing significant innovations and enhancements as the end of 2025 approaches. As the year closes, new opportunities are emerging for CRS.

CRS is excited to introduce Multilid®-2, an innovative and patent-pending lid lifting solution developed during 2025.

This solution enables Rotainers® to accommodate any lid on any container at any time, including CRS's newly introduced Ecotainer®, which is set to commence operations in Q2, 2026.

The Ecotainer® is a low-cost, uncomplicated concentrate container specifically designed for mining applications, capable of handling gross weights of less than 35,000kgs. It is ideally suited for CRS's Multilid® lid lifting systems.

Recently, CRS Engineering was approached by one of Australia's premier CBH operators with a crucial question: how can we cater to the wide array of open-top containers currently in the market, including those with patented lid systems?

In response, CRS upgraded its successful Multilid®-1 to make it fully adjustable in both the transverse and longitudinal axis. This allows the lid lifting frame to be easily adjusted in all directions and pinned in the appropriate position.

With CRS's proprietary 'Claw' lid lock manipulating apparatus, no lid or lock is beyond the reach of CRS lid lifting systems.

CRS stands out as the only manufacturer offering multiple lid lifting systems, opening up more industry opportunities and providing new economical options for the CBH industry, where dust free, environmentally friendly, open-top containers are essential.

Integrated Telestack solution boosts

Multi-purpose Telestack system used for shiploading and unloading (stockpiling).

Bristol Port, a significant player in the UK's maritime infrastructure, needed to enhance its quayside operations for loading aggregates and fines onto coaster vessels. The port aimed to increase vessel turnaround speed, lower operational costs, and minimize reliance on wheel loaders.

- Telestack supplied an integrated, three-unit mobile system: a HF 12 hopper feeder, a TL 18 link conveyor, and a TB 42 shiploader.
- The system provides a direct, continuous path for material from the initial feed point on the quayside through to the vessel.
- It consistently achieves average loading rates of 800tph (tonnes per hour) and can handle peaks of 1,000tph.

efficiency for Bristol Port

- This high-capacity transfer significantly boosts production and drastically reduces vessel turnaround times.
- The process substantially reduces the need for wheel loaders, which directly lowers operational costs.
- The TB 42's radial and telescopic functions allow for precise vessel trimming from a single feed position, enhancing efficiency.

The system incorporates extensive dust suppression measures, including an overband magnet to remove tramp metal, dust covers on all conveyors, a spray bar, and a rubber sock chute to ensure clean loading. The reduction in mobile plant traffic on the quayside also contributes to a safer and more organized working environment. The inherent mobility of each unit provides Bristol Port with the flexibility to adapt the setup for different materials or berth configurations.

Optimized transfer points slash downtime and boost

In mineral processing operations, unplanned downtime can rapidly translate into lost production, missed targets and escalating costs. One of the most common — and most overlooked — contributors to these interruptions is poorly designed or worn transfer points. These critical areas, where material moves from one conveyor to another or into processing equipment, are subject to extreme wear, dust generation, spillage and blockages if not engineered for the specific application.

Weba Chute Systems, a recognized global expert in custom-engineered chute solutions, has long emphasized that optimizing transfer points is one of the most effective ways to reduce maintenance requirements, extend equipment life and increase throughput.

A Weba Chute Systems conveyor transfer chute in operation at a Mpumalanga mine, efficiently transferring thermal coal with minimal spillage and wear.

Pinpointing the problem

"Many plants operate with transfer points that were either part of the original design or added later without a detailed engineering assessment," Dewald Tintinger, Technical Director at Weba Chute Systems, explains. "These chutes may not be suited to the current material characteristics, tonnage rates or operating conditions, resulting in accelerated wear, excessive maintenance and unexpected stoppages."

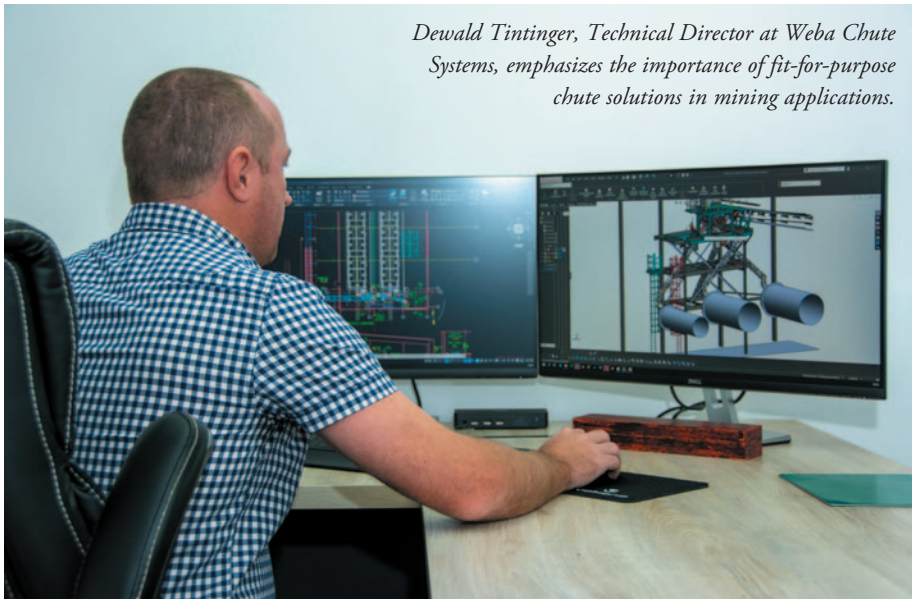
Unplanned maintenance on transfer points is not only disruptive but costly. Frequent liner replacement, unblocking of material build-up and cleaning of spillage can take equipment offline for hours at a time. The cumulative effect is a measurable loss in productivity and a higher total cost of ownership.

An optimized Weba Chute Systems transfer chute reliably handles coal at a Limpopo mining operation, ensuring smooth flow and reduced maintenance.

Fit-for-purpose retrofit solutions

Weba Chute Systems offers a specialized assessment service for existing chute installations. This involves a detailed on-site inspection, operational analysis and where required, advanced flow simulation to identify the root causes of inefficiency or premature wear.

"Our expertise lies in engineering and manufacturing chutes that control the flow of material through optimal trajectory and velocity," Tintinger says. "This reduces impact and turbulence,



Dewald Tintinger, Technical Director at Weba Chute Systems, emphasizes the importance of fit-for-purpose chute solutions in mining applications.

productivity in minerals processing plants

minimizes dust and spillage and delivers a steady controlled feed to the next stage in the process."

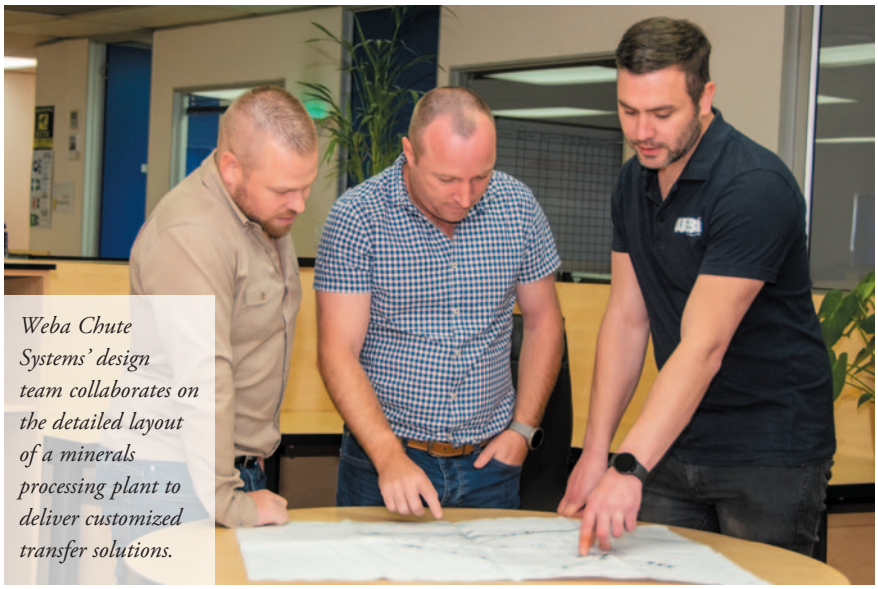
Retrofit solutions from Weba Chute Systems are custom engineered to integrate seamlessly into existing plant layouts, avoiding major structural changes while delivering significant performance gains. Many customers report reduced maintenance intervals, improved safety and increased uptime within weeks of installation.

Driving productivity and savings

An optimized transfer point not only lowers direct maintenance costs but also safeguards downstream equipment from damage caused by uncontrolled material flow. By reducing spillage and dust emissions, plants also benefit from cleaner safer working environments and compliance with environmental standards.

"In many cases, the investment in a retrofit chute pays for itself quickly through reduced downtime alone," Tintinger notes. "When you factor in lower maintenance costs and longer wear life, the return on investment becomes compelling."

With decades of experience and installations across the globe, Weba Chute Systems continues to help mineral processing plants turn a known bottleneck into a high performance asset - proving that small changes at transfer points can deliver big gains in plant productivity and profitability.



Weba Chute Systems' design team collaborates on the detailed layout of a minerals processing plant to deliver customized transfer solutions.

Custom-engineered transfer chutes are being manufactured at Weba Chute Systems' Wadeville factory in Germiston, ready for delivery to mining customers.

Wear components inside a Weba Chute Systems transfer chute are inspected through an access door at an iron ore mine in the Northern Cape.

Rock Machinery becomes full-line Superior dealer with addition of conveying equipment

Superior Industries, Inc., a US-based manufacturer and global supplier of bulk material processing and handling systems, is further strengthening its partnership with Rock Machinery. Effective 1 January 2026, the Wisconsin-based dealer will represent Superior's complete line of conveyors in addition to the crushing, screening, and washing products in Wisconsin, Illinois and the western half of Michigan's Upper Peninsula.

"This addition allows us to go to market with one manufacturer for every stage of the aggregate processing workflow," added Bryant Frazier, President of Rock Machinery. "From jaws, cones, and impactors to screens, screws, structures, and conveyors, our customers can now work with a single, unified team to deliver a finished spread faster and with fewer complications."

For producers, the real benefit begins after the sale. With Rock Machinery's local support team backed by Superior's hands-on technical expertise, the two companies will work closely to help customers fine-tune production, reduce downtime, and keep material moving. It's a partnership built on technical depth, speed of response, and genuine care for each operation's success.

"Rock Machinery continues to prove why they're such an important partner in our dealer network," said Jeff Gray, Director of Sales at Superior Industries. "They've built a strong reputation for delivering on their promises and supporting customers with integrity in every interaction."

In addition to its stock crushers, screens, and washing equipment from Superior Industries, Rock Machinery also plans to stock a significant number of conveyors including:

- 36 x 136 Low Profile TeleStacker® Conveyors;
- 36 x 150 TeleStacker® Conveyors;
- 36 x 70 Slide-Pac™ Conveyors;
- 42 x 70 Slide-Pac™ Conveyors;
- 36 x 125 PowerStacker® Conveyors;
- 36 x 80 Portable Radial Stacking Conveyors; and
- 36 x 60 Stackable Conveyors.

Together, Superior and Rock Machinery are making it easier than ever for producers to build integrated spreads with equipment and expertise that work hand-in-hand from start to finish.

About Superior Industries, Inc.

Superior Industries is a deeply-rooted, privately-owned American manufacturing company whose products play a pivotal role in production and transportation of ingredients used to build the world's infrastructure.

Superior Industries' specialties include crushing, screening, washing, and conveying systems, alongside comprehensive parts and services that support robust construction aggregates production from Rock Face to Load Out®.

Equipped with one million square feet of manufacturing space and more than 100 engineers, Superior is headquartered in Morris, Minnesota, with four additional production facilities in the United States, plus international manufacturing locations in Canada, Brazil, and Asia.

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Weba Chute systems drive down dust

At this steel plant, a Weba transfer chute is shown managing heavy material flow while effectively lowering dust emissions in a demanding environment.

Dust generation has long been a critical challenge in bulk materials handling, with significant implications for safety, health and environmental compliance. Weba Chute Systems, a major specialist in custom-engineered transfer point solutions, has positioned its technology as a proven way to dramatically reduce dust transmission while simultaneously improving operational efficiency.

Dust — more than just a nuisance

In industries such as mining, power generation, cement and ports, dust is more than a simple housekeeping concern. Airborne dust creates serious health risks for workers, contributes to environmental pollution and can trigger regulatory penalties when emissions exceed permissible levels.

Dust also increases maintenance requirements, shortens equipment life and can even create safety hazards such as reduced visibility or combustible atmospheres.

"These are not minor inconveniences," notes Dewald Tintinger, Technical Director at Weba Chute Systems. "Dust impacts the health of employees, the lifespan of equipment and the company's environmental footprint. Left unchecked, it can cost operations heavily — both financially and reputationally."

These challenges have intensified with stricter environmental regulations globally and a growing focus on sustainable operations. Companies are under pressure not only to comply with legislation but also to improve their ESG performance. Weba Chute Systems' transfer point solutions are helping operators address these concerns head-on.

Engineered chutes that control flow

At the heart of Weba Chute Systems' dust-reduction capability lies its fundamental design philosophy — controlling the flow of material. Traditional chute systems often allow material to free-fall, leading to uncontrolled impact, turbulence and the generation of dust clouds. By contrast, Weba Chute Systems are engineered to control both the velocity and direction of material flow.

"The principle is simple," Tintinger explains. "If you reduce impact and turbulence, you reduce the energy that causes particles to become airborne." By carefully directing material onto the conveyor in a streamlined manner, dust generation is drastically curtailed.

"Our designs are not generic. Every transfer point is engineered to suit a customer's specific conditions, so the system works with the material rather than against it," he adds.

Lining and sealing for dust containment

A further feature of Weba's design is the effective sealing of the chute system. Engineered with wear resistant liners and designed with attention to transfer geometry, the chutes prevent dust from escaping into surrounding areas. Where needed, dust suppression or extraction

Weba Chute Systems' Technical Director, Dewald Tintinger, underlines the importance of chute design in achieving dust suppression and sustained operational performance.

transmission in bulk materials handling

systems can be integrated seamlessly into the chute design, ensuring compliance with the most stringent emission standards.

Weba Chute Systems' in-house design team uses the latest simulation software, including discrete element modelling (DEM), to predict material behaviour inside the chute. This allows the company to optimize liners, flow paths and sealing systems before manufacturing begins. The result is a custom-engineered solution that not only contains dust but also minimizes spillage and wear.

"Our DEM capability gives us a powerful window into how the material will behave," Tintinger points out. "We can predict dust issues before they occur and design them out of the system — that is a real game changer."

Efficiency and environmental gains

Reducing dust transmission is not just about compliance; it also improves the bottom line. Dust that escapes into the air represents a loss of valuable product. By containing material more effectively, Weba Chute Systems help customers improve throughput and reduce waste.

At the same time, less dust means reduced wear on conveyor components, lower cleaning and maintenance requirements and safer working environments. These gains contribute directly to operational efficiency and sustainability.

"As much as dust control is a health and safety imperative, it is also a cost issue," says Tintinger. "Every tonne of material lost to dust is revenue gone. By addressing dust, we protect both people and profits."

Proven success across industries

Weba Chute Systems' dust-control solutions are in operation across a range of industries and commodities from mines to power stations, cement plants and other bulk handling facilities. Each system is custom engineered for its specific application, taking into account the type of material, the rate of flow, particle size and environmental requirements.

In ports and loading terminals, where dust emissions are highly visible and subject to strict monitoring, the systems ensure compliance while maintaining fast loading rates.

"Whether it is in large scale port operations or on a mine, the principle is the same," Tintinger says. "Control the flow, contain the dust and you achieve safer, cleaner, more efficient operations."

Commitment to innovation

With decades of experience and thousands of installations globally, Weba Chute Systems continues to invest in innovation. Its dedicated research and development team works constantly to refine designs, enhance materials and explore new methods of dust suppression.

The company's approach is not limited to the initial installation. Weba Chute Systems provides ongoing inspection and maintenance services to ensure systems continue to perform optimally over their lifetime. Customers benefit from reliable transfer points that remain compliant and efficient long after commissioning.

Tintinger says that as industries move towards more sustainable, responsible and efficient operations, dust control has become an imperative rather than an option. "Our engineered transfer points provide a holistic solution, reducing dust transmission, enhancing safety, safeguarding the environment and improving efficiency," he says.

"By addressing dust at its source — within the transfer point itself — we help operators move beyond reactive measures and achieve proactive control. This not only ensures regulatory compliance but also delivers lasting value to both business and society," Tintinger concludes.

This Weba screen oversize-to-conveyor chute installation demonstrates how advanced flow control and sealing methods reduce dust, spillage and excessive wear at a steel plant.

The installation of this Weba screen oversize-to-conveyor chute highlights the company's tailored approach to creating dust-mitigated transfer solutions for steel plant operations.

Electric drive on the rise

The LHM 800 was handed over to Marcor and is now in operation at the Port of Rotterdam on the North Sea.

As sustainability takes centre stage and the transition from fossil fuels is both an environmental and economic imperative, the demand for electric drive systems is accelerating. Liebherr meets this momentum with corresponding drive types, each engineered to deliver optimal performance tailored to individual on-site requirements.

Liebherr, the prominent expert in mobile harbour crane technology, continues to drive innovation in sustainable port operations. With over 2,000 mobile harbour cranes produced and around 1,600 currently in operation across more than 130 countries, Liebherr has played a key role in advancing electric drive technologies in port handling — continuously refining and expanding its solutions over several decades.

Key regions have embraced electrically driven mobile harbour cranes, underscoring their growing importance and reinforcing Liebherr's role as a reliable partner in the industry. India leads in adoption, followed closely by Türkiye. In Europe, the Netherlands, France and Poland also demonstrate steady demand for e-drive technology, alongside the United States and the United Kingdom.

Between 2019 and 2025, Liebherr recorded a significant increase of 400% in its electric drive mobile harbour cranes. This substantial increase underlines the clear movement within the industry towards integrating more sustainable technologies in port operations.

"Our clients have benefitted from the integration of electric drives into our product range for over two decades," said Franz Findel, product manager at Liebherr-Rostock GmbH. "Beyond the considerable reduction in CO_2 emissions and noise levels, e-drives require minimal consumables and feature fewer moving parts — significantly reducing maintenance demands and associated costs. These advantages contribute directly to improved overall efficiency and operational reliability, without sacrificing speed or lifting capacity."

Retrofitting meets the present

The Liebherr drive system portfolio continues to evolve with the different infrastructural and regulatory conditions across global port environments. This means that the electric drive is not just an option when building a new crane but can also be retrofitted. Cranes that have operated reliably for years can be converted from a diesel to e-drive, supported by Liebherr's worldwide customer service network.

In this way, port operators are not only responding to changing circumstances, such as state funding programmes or infrastructure expansion in ports, but are also modernizing their equipment to ensure continued successful operation for many years to come — always with a focus on efficiency.

Future-ready solutions for efficient operations

During heavy lift operations, cranes often experience idle periods when no load is being moved. In these moments, opting for an e-powered drive offers a significantly more sustainable solution. While a diesel engine continues to emit approximately 24kg of CO_2 per hour even when idling, the e-drive consumes no extra energy during these pauses. When powered by renewable energy sources, the environ-

The LHM 800 is equipped with a cable drum located at the rear of the crane. The cable runs through a duct along the quay, providing protection against damage.

mental benefits are even greater – handling operations at the quayside with an electric Liebherr mobile harbour crane can reduce CO_2 emissions by up to 100kg per hour compared with a diesel driven mobile harbour crane.

Beyond environmental advantages, the e-drive also delivers economic and operational benefits. Many countries offer attractive subsidies for the adoption of alternative energy technologies, supporting industries in meeting national CO_2 reduction targets. Additionally, electric drives require less maintenance than their diesel counterparts — eliminating the need for oil changes, fluid checks and filter replacements. This not only reduces operating costs but also simplifies service routines, making the edrive a suitable choice for efficient and responsible port operations today.

About Liebherr-Rostock GmbH

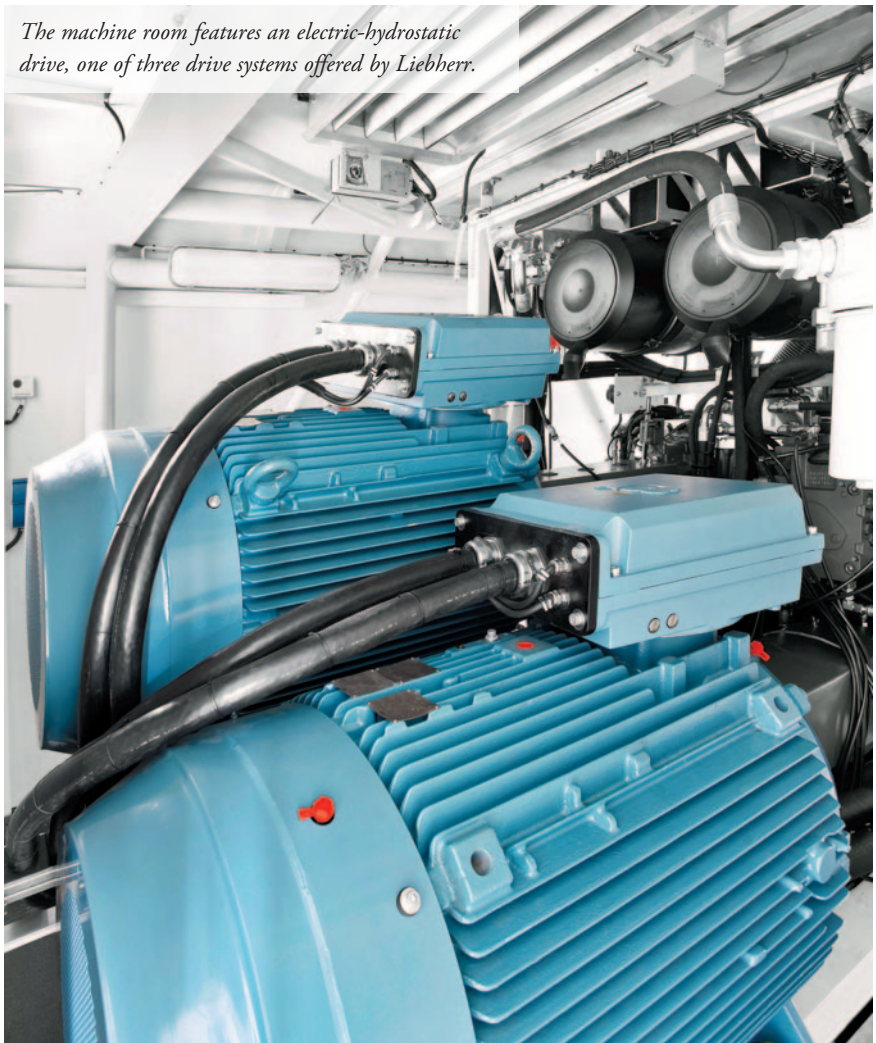
Liebherr-Rostock GmbH is one of the leading European manufacturers of maritime handling solutions. The product range includes ship, mobile harbour and offshore cranes. Reachstackers and components for container cranes are also included in the product portfolio.

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 2024, 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. DCi

The machine room features an electric-hydrostatic drive, one of three drive systems offered by Liebherr.



Attrezzatura Italiana

Italian equipment manufacturers

Jay Venter

Image 1: ESPLV in Maryneal, Texas, USA.

Image 2 & 3: MDG ESPLV head stations equipped with double drive.

MDG Handling Solutions high-capacity bucket elevators

Since 2017 MDG has been developing and manufacturing loads of bucket elevators for lifting a wide range of bulk solid materials.

Thanks to its continuous research and development effort and to the quality of its equipment, addressed to their maximum reliability, MDG maintains a good position among the leading manufacturers of this sector.

MDG BUCKET ELEVATORS — ESPLV

MDG's ESPLV bucket elevators are double-chain bucket elevators that represent one of the most modern lines of heavy-duty elevators providing the highest flow rate: 2,000m^3/h and more.

One of their main features are the large-sized buckets with a capacity up to 290 litres each on the largest elevators.

The chains are mechanical type with pin and bush, also designed for very high breaking loads (up to 4,000kN).

Thanks to the continuous buckets, this series of MDG bucket elevators have great flexibility allowing both slow as well as high speeds. They are used when a low speed is required (less than 0.7m/s), as in the case of lifting granular fertilizer material or for lifting medium-sized materials (50–100mm), and also when high speed is possible (> 1.5m/s) in order to minimize the size — and therefore the cost — of the bucket elevator required.

When speeds lower than 0.8–0.9m/s are required, the action of discharging the material, although external to the trajectory of the buckets, occurs due to the combined effect of centrifugal force

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and gravity, with the material flowing on the back of the preceding bucket, thanks to the continuous bucket system. Therefore, when the material is being discharged, the back of each bucket acts "as a slide" for that part of the material that is forced to follow a less effective expulsion trajectory due to insufficient centrifugal force. This allows an easy discharge through the outlet chute.

- When lifting granular fertilizer, the low speed aims to minimize the crushing of the granules and the level of powdering, mandatory for guaranteeing good product quality.

The low speed also allows the buckets to load (partly with dredging) and lift materials with larger grain sizes, up to 80–120mm.

- When speeds exceeding 1m/s are allowed (the most frequent case) — usually up to 1.5–1.6m/s — it is allowed the highest flow rate of material to be lifted. In this case the material is usually discharged centrifugally.

A hydraulic tensioning system is frequently used for tensioning the chains, thus allowing for high loads (if necessary) as well as easy and uniform adjustment of the chains.

Image 4: ESPLV wheels.

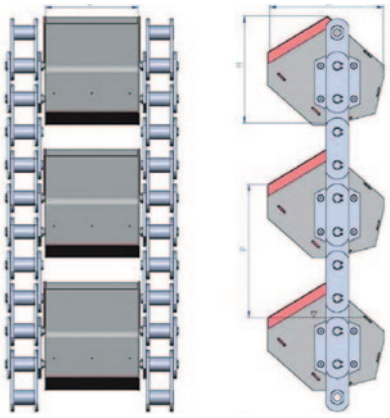


Image 5: ESPLV chains.

The larger MDG bucket elevators are equipped with double drive unit (see images 2 & 3).

Case study

In the cement industry this type of MDG high-capacity bucket elevator is used to lift a wide range of bulk materials such as clinker, raw meal, raw mix, limestone, cement, coal, to name a few.

Recently MDG acquired an order from DYPNF, South Korea, for the supply of a high-capacity bucket elevator, the length of which is 50.6m.

This MDG elevator conveys petroleum coke (100mm max) at a speed of 1.3m/s and thanks to its two lateral bushed chains, which have a breaking load of 1,500kN each, represents the best MDG solutions to serve this purpose.

SafeForPorts+: advancing smart and sustainable port operations

The new initiative extends the current project by enriching VR training and intelligent support systems to transform operational safety and efficiency at ports

Tenova is strengthening its commitment to innovation in port operations through the SafeForPorts project and its new extension, SafeForPorts+. Developed within the framework of the Istituto Italiano di Tecnologia (IIT) initiative RAISE (Robotics and AI for Socio-economic Empowerment), implemented under the National Recovery and Resilience Plan, Mission 4 funded by the European Union – NextGenerationEU, and carried out together with technology partners Prosoft Intesys and InformAmuse, SafeForPorts is integrating Industry 4.0 technologies to make port environments safer and more efficient. It combines remote training and assisted maintenance to improve the safety of machine operators and optimize workflows in port areas. At its core, the project is creating a virtual-reality simulator for ship-unloader operators, developed in Tenova's Genoa laboratory, together with an on-field assistance system that leverages computer vision and wearable devices to enable hands-free workflows, automatic recognition of cracks and other damaged parts, and real-time reporting to support predictive maintenance. This integrated approach is also laying the groundwork for future Digital Twin applications in unmanned cargo operations.

SafeForPorts+ represents a further development of this work. In parallel with the implementation of SafeForPorts, Tenova and its partners are extending and validating the solution, enriching both the VR simulator and the intelligent support system with new functions and improved performance. The virtual training environment is being expanded to include key kinematic variables, such as hold depth and trolley travel length, and simulate additional ship unloader types. The on-field support component is being enhanced through the integration of thermographic data into the head-mounted device, broadening the system's diagnostic capabilities and opening the way to a multimodal model that combines visible and infrared imaging.

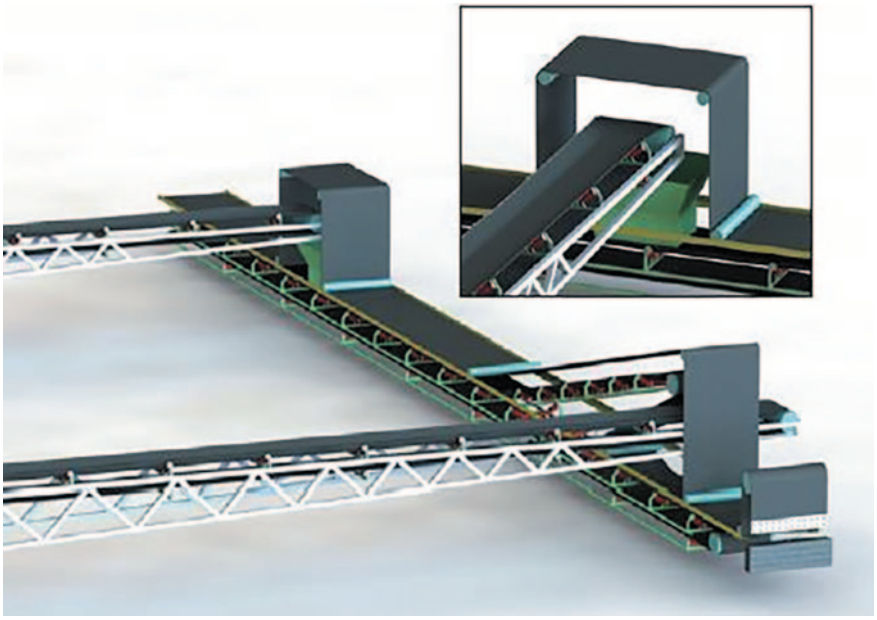
Through these developments, SafeForPorts+ increases the impact and applicability of the technology while consolidating the investments already made. It also lays the foundations for deploying Tenova's solutions in new operational scenarios beyond the original application, reinforcing the company's role in advancing robotics, AI and Industry 4.0 systems for sustainable and intelligent port operations.

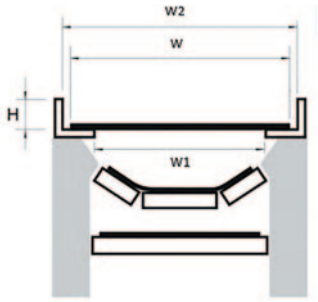
Innovation and Italian leadership: how SIG is revolutionizing conveyor belt handling with SEALTEX rubber belts

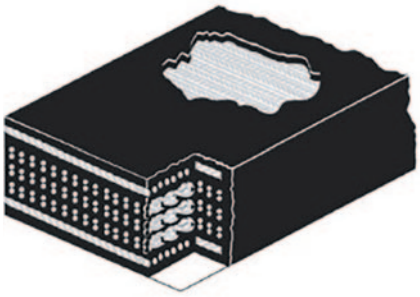
Being a prominent Italian brand in the rubber conveyor belt industry has been a source of great pride to SIG: over the years, despite many different challenges that have risen along the way, giving up has never been an option, and SIG has always fought to keep improving meanwhile achieving great results.

Developing high-tech products to match new and more demanding international market requirements is a daily task that requires SIG's technical department to design items that can meet customers' expectations. Thanks to an advanced research and development internal lab, every single day SIG's work aims at setting up new reliable solutions offering end users a way to solve their problems.

In this development context, SIG's technical department has been able to think of and later design a revolutionary product that could guarantee safe handling solutions that avoid dust and material spillage, all the while protecting handled goods. This item, named SEALTEX according to SIG nomenclature, has completely changed the way of working, especially inside port terminals.







SEALTEX, self-supporting conveyor belts: design principles and installation guidelines

SEALTEX can be defined as 'self-supporting conveyor belts for covering and sealing applications' a sentence summarizing its special and high-tech construction meanwhile defining its function 'in combination with' another main rubber conveyor belt. As a matter of fact, it always works 'in support of' main items handling bulk goods.

This characteristic depends on the fact that once installed, SEALTEX is supported over lateral holders and — thanks to its high transversal rigidity — it stays over the underling conveyor, avoiding material spillage in this way. For this reason, this belt can be defined as a 'self-supporting' item.

Design principles and installation guidelines of SEALTEX

When designing a conveyor system where SEALTEX will be installed, great attention must be paid to the distance between the two sides of lateral holders. This space must be wide enough to allow correct functioning of the below main belt when dropping on discharging tripper or in correspondence of loading hoppers.

At the same time, it is essential to ensure that lateral holders' height and width should be enough to guarantee belt stability, normally following these recommendations:

- Lateral holders' height (H) should always be equal or bigger than 40mm (H >/= 40mm)
- The distance between the two lateral holders' sides on which SEALTEX is placed (W1) must be equal or inferior to SEALTEX overall width (W) less 300mm (W1 < or = W – 300mm)
- The global width of lateral holders (W2) must be equal or inferior to belt width (W) plus 100mm (W2 < or = W + 100mm)

Advanced SEALTEX carcass construction

Enhancing transversal deflection and durability for heavy-duty conveyor systems

SEALTEX's carcass construction consists of a combination of EP fabrics and a double layer of special steel cables, with composition and position depending on specific structural calculations based on belt width and weight to be supported.

This special construction reflects the need to assure maximum transversal deflection to let this belt adapt itself in the most suitable way to the conveyor system and to the potential need to be lifted to allow the passage of discharged tripper or loading hoppers.

Furthermore, when facing extremely demanding and heavy industrial applications or very wide belts, it is also possible to increase belt overall resistance using a bigger and stronger steel transversal reinforcement ('breaker') placed in belt top cover.

In global terms, SEALTEX's carcass construction can be considered a technologically advanced combination of EP fabrics and steel cords to guarantee maximum transversal deflection and good transversal rigidity.

SEALTEX rubber compounds

Tailored solutions for optimal conveyor belt performance

SEALTEX's rubber belt is always installed in combination with a main underling rubber conveyor belt handling bulk goods to avoid any potential dust or material spillage.

Therefore, this revolutionary item's most important function is to prevent any material dispersion or loss in the surrounding environment.

To accomplish this task, SEALTEX must not only be manufactured with all the necessary mechanical characteristics — such as transversal rigidity and deflection — but it also must be equipped with rubber covers that have chemical properties that match the handled goods. For instance, if the main rubber conveyor belt is handling such an abrasive material as bauxite, SEALTEX must be equipped with a superior abrasion resistance rubber compounds (having an abrasion loss equal or inferior to 50mm³) to avoid any potential belt early replacement which can be caused by bauxite dust.

Alternatively, with flammable materials, it is also necessary to consider the use of self-extinguishing rubber compounds, to avoid any potential fire explosion due to flammable dust dispersion in the surrounding areas during handling. To summarize, SEALTEX's top and bottom covers can be manufactured relying on:

- **Abrasion-resistant rubber compounds:** available in standard (DIN 22102 Y), extra (DIN 22102 W), and superior grades (≤50mm³ abrasion loss);
- **Flame-resistant rubber compounds:** self-extinguishing materials that are compliant with DIN 22102 K standards for fire prevention;
- **Heat-resistant rubber compounds:** designed to withstand continuous working temperatures up to 130°C and peaks of 150°C.

What are the main advantages and structural features of SEALTEX?

SEALTEX is SIG covering and sealing belt, mainly installed to avoid potential dust or material spillage in the surrounding area, therefore protecting environment. This belt can be considered an environmentally friendly solution.

In terms of SEALTEX's composition and its industrial applications, the main belt main advantages include:

- double steel transversal breaker in the top cover, also protecting inner carcass;
- excellent transversal stiffness;
- high longitudinal flexibility;
- minimum lateral support required; and
- UV & ozone total protection;

Case study: installation of SEALTEX for a bauxite handling port terminal in West Africa

Introduction — efficiency and sustainability in port handling

The project to install a SEALTEX at a port terminal dedicated to bauxite handling in West Africa is a concrete example of how innovation and sustainability can coexist in the industrial logistics sector. The main objective was to ensure a safe, efficient, and environmentally friendly bulk material transport system, minimizing the dispersion of dust and materials during shiploading and unloading.

What is SEALTEX, and why is it essential in port terminals?

SEALTEX is a sealing and containment solution for conveyor belts designed to prevent material spillage during the handling of bulk goods such as bauxite, coal, minerals, and fertilizers.

Thanks to its flexible and resistant structure, SEALTEX ensures:

- reduction of material loss along the conveyor belt;
- dust containment for a cleaner and safer working environment;
- lower environmental impact by preventing contamination of the surrounding soil and water; and
- greater operational efficiency and reduced maintenance costs.

The challenge: handling bauxite in extreme conditions

The port terminal involved in the project is in West Africa, in an area characterized by difficult climatic conditions and high volumes of bauxite handling.

It was therefore necessary to implement a customized sealing solution capable of ensuring mechanical resistance, durability, and sealing even in the presence of abrasive dust and atmospheric agents.

Technical solution developed by SIG

In collaboration with SIG's technical department, a SEALTEX casing configuration specifically designed for this port facility was approved:

- **EP400/2 casing (width 1,800mm):** reinforced with two steel breakers for high transverse strength.
- **EP800/2 casing:** equipped with a highly abrasion-resistant compound (loss less than 50mm³); total length: 792 metres.

These specifications ensured optimal sealing, long life, and high performance even under the most demanding operating conditions.

Results achieved

After installation, the SEALTEX system demonstrated:

- zero material spillage during loading and unloading;
- significant reduction in dust emissions in the port environment;
- increased logistics efficiency and lower plant maintenance costs; and
- satisfaction of the end customer, who now has a safer, cleaner, and more sustainable plant.

Conclusion

This case study demonstrates how SIG's SEALTEX technology represents an innovative solution for handling bulk materials in port terminals, ensuring high performance, safety, and environmental compliance.

Thanks to its versatility and customization options, SEALTEX is an ideal choice for industrial applications that require reliability, containment, and durability over time.

Written by Mr. Niccolò Feliciano, SIG – Società Italiana Gomma Spa

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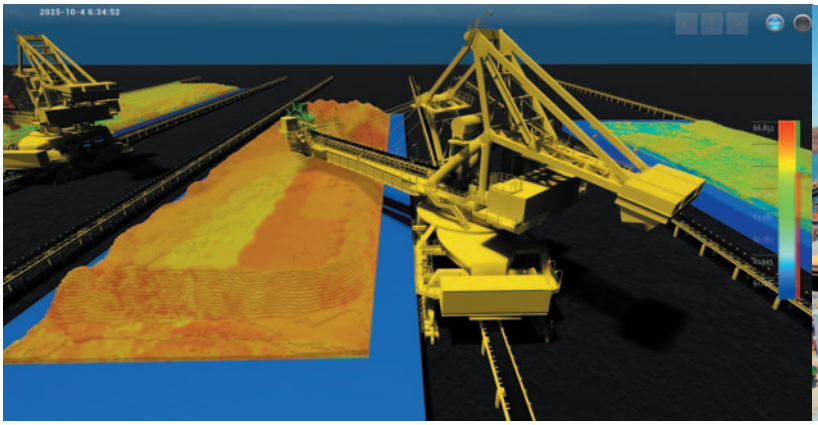
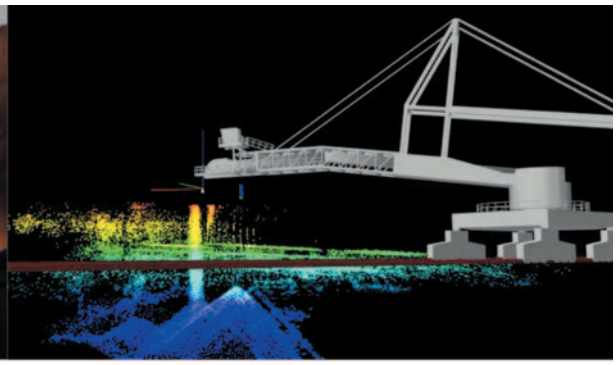
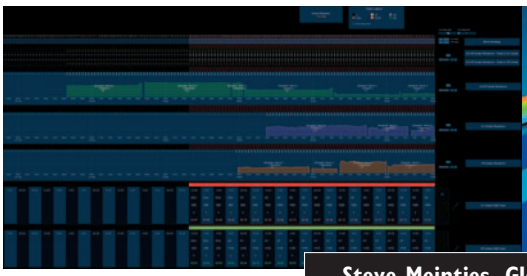
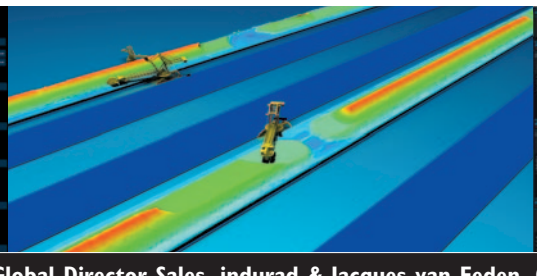
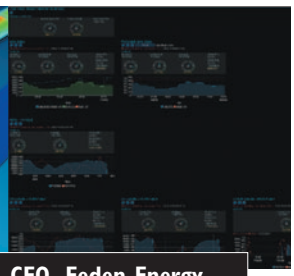


Steve Meintjes, Global Director Sales, indurad & Jacques van Eeden, CEO, Eeden Energy.

Introduction

Operational efficiency, safety, and sustainability are critical imperatives in bulk material handling ports. By embracing optimization strategies and leveraging off-the-shelf Industry 4.0 technologies, ports can significantly enhance these critical imperatives and improve overall operational performance.

At the forefront of port transformations is indurad, a Hexagon company, whose cyber-secure, robust RADAR technology is revolutionizing real-time measurement, tracking, and management of bulk materials across the value chain.

In today's increasingly automated port environments, precision planning is essential. The Eeden Energy AX platform redefines port loadout operations by integrating digital twins, spatial databases, and advanced analytics delivering unparalleled control over material grades, inventory, and blending.

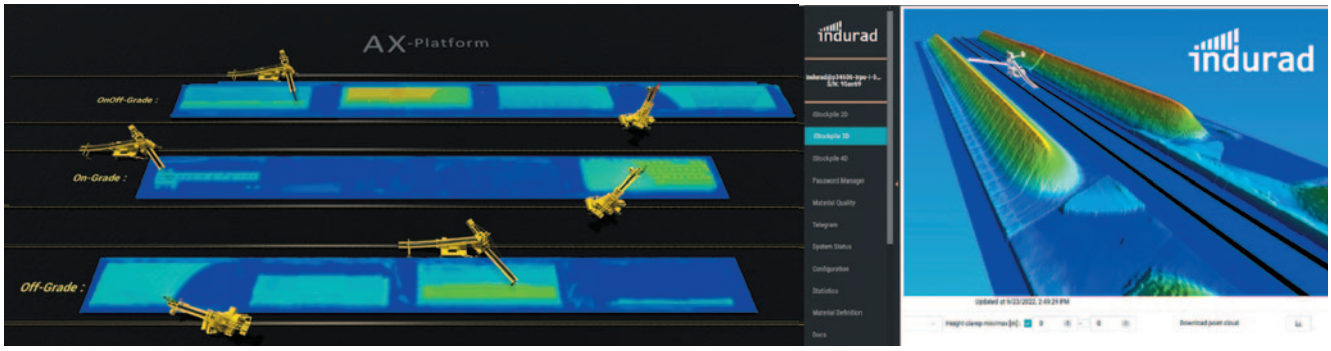
This editorial explores how indurad's iStockyard RADAR solutions, combined with Eeden Energy's modular AX Platform forms, "iStockyardAX", a unified solution that transforms traditional ports into intelligent, autonomous operations that boost efficiency, reduce risk, and ensure product quality.

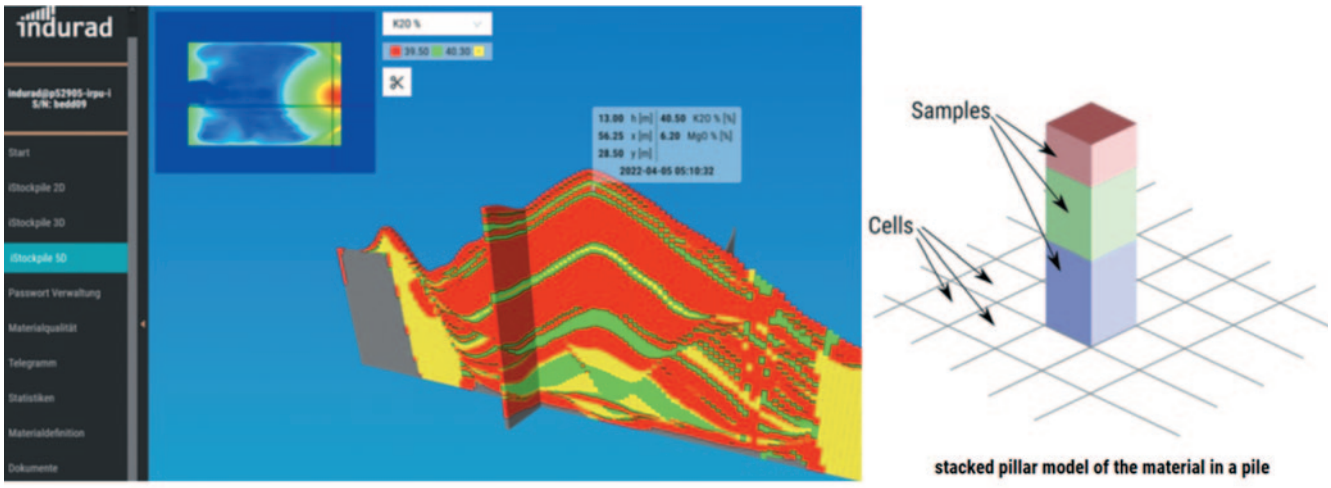
Digital twin and spatial database

At the heart of the iStockyardAX Platform lies a voxel-based spatial database that model stockpiles as 3D cubes, each tagged with timestamped quality and inventory data. Unlike traditional moving-average systems, iStockyardAX offers granular control over material flows by leveraging industrialized RADAR to capture both static and dynamic volumetric data in real-time. This enables real-time visualization, planning, and reconciliation. Each high-resolution voxel (250mm × 250mm × 50mm) stores chemical and physical material attributes, enabling operators to trace material origin, age, and quality distribution with surgical precision.

Strategic importance of grade control

Grade control is the cornerstone of quality assurance in bulk material handling. It





stacked pillar model of the material in a pile

ensures that delivered materials meet customer specifications, optimize resource utilization, and support sustainable operations. With real-time grade control capabilities, iStockyardAX empowers port operators to make proactive decisions, minimize waste and off-spec cargo, and enhance profitability.

Key benefits of accurate grade control

- **Penalty avoidance:** precise blending ensures compliance with customer specifications, reducing the risk of costly penalties and rejected shipments.
- **Optimized use of over-grade material:** high-grade material can be strategically used to blend with lower-grade stock, maximizing resource value.
- **Dilution control:** real-time 3D models help avoid reclaiming from contaminated zones, minimizing dilution.
- **Improved reconciliation:** live analytics track quality movement, enabling continuous reconciliation and operational adjustments.
- **Optimized blending:** simulation tools allow planners to test blend scenarios, reducing trial-and-error and improving consistency.
- Reduced waste and rework: autonomous control ensures accurate execution, minimizing off-spec dispatches.
- **Enhanced resource utilization:** accurate identification of high-grade zones improves recovery rates and reduces costs.
- **Real-time decision support:** integration with smart sensors delivers near real-time quality data for proactive decision-making.
- **Sustainable operations:** supports long-term planning and environmental goals by minimizing waste and maximizing efficiency.

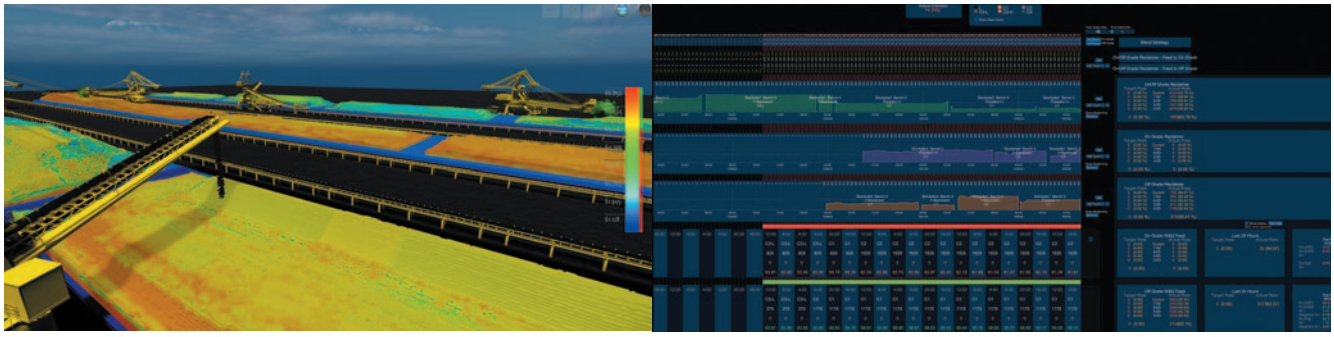
Planning, simulation, and autonomous execution

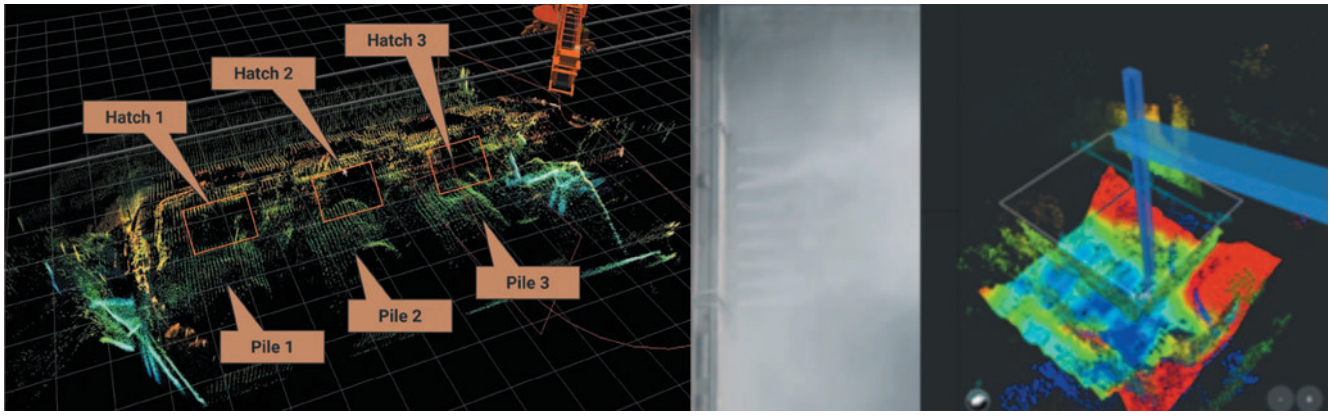
iStockyardAX's Planning Toolbox includes statistical box plots, solver functions, and simulation GUIs (graphical user interfaces) that allow planners to model reclaim scenarios, forecast loadout quality, and generate autonomous work instructions.

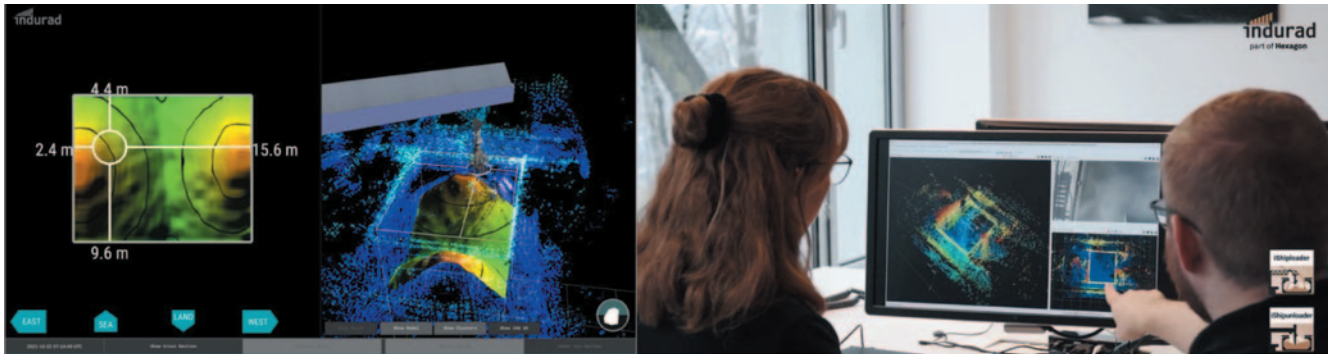
For ship and train loading and unloading, or continuous plant feeds via overland conveyors, planners can visualize prospective blend outcomes up to 144 hours in advance, adjust reclaim rates, and ensure compliance with quality targets as defined in supply contracts.

Visualization and reporting

iStockyardAX combines intuitive 2D and 3D visualizations of stockpile inventory, quality distribution, and machine status. MS Power BI dashboards offer real-time and historical insights into inventory movement, quality trends, and plan adherence. These tools enhance transpar-







ency, support retrospective incident investigations, and drive continuous improvement.

Autonomous control and system integration

iStockyardAX integrates seamlessly with Automation Systems to safely execute stockpile reclaiming, maintain shiploading and unloading schedules, while operating autonomously. Work instructions are sent directly to the machines, ensuring precise execution of loading and reducing human error. The iStockyardAX system monitors machine status, alarms, and performance metrics, providing a robust framework for operational integrity.

Autonomous control and safety integration

indurad's combined RADAR, GNSS and RTLS-based collision avoidance systems are widely deployed in Mines, Plants & Ports, providing early-detection, while simultaneously providing accurate material volume levels and pile profiles in the hold during loading and unloading, no matter the atmospheric conditions.

Shiploading optimization

indurad Provides 3D Hatch scanning, 1D & 2D spout protection, helping port operators with safer and timely loading/unloading duties. indurad's industrial RADAR systems 'penetrate' dust suppression systems providing insights while loading or unloading, where eyesight, cameras and light-based scanning systems fail.

Conclusion

Bulk material handling ports face increasing pressure to enhance operational efficiency, ensure safety, and meet sustainability goals. iStockyardAX is enabling operational excellence across port operations, by delivering real-time grade control and intelligent planning with precision execution.

Whether its avoiding penalties, maximizing over-grade material, or advancing sustainability goals, iStockyardAX is the strategic solution for modernizing bulk material handling operations. DC

Ending product loss...

... from belt misalignment at transfer terminals

Shifting material causing mistracking (all pictures: ©Martin Engineering).

When the belt of a bulk handling conveyor drifts out of alignment, one side moves higher up the troughed idler path than the other, *writes Jerad Heitzler, Training Manager / Martin Engineering*. This causes the load to shift off centre, making the situation worse the farther it travels.

That is the point when safety degrades and costs skyrocket.

If there is a stop mechanism, it will grind everything to a halt and lead to unscheduled downtime, over and over again until the misalignment is resolved. Without a stop mechanism, material can spill along the belt path, idlers and pulleys will get fouled, and the belt can rub against the stringer, causing belt damage and a potential friction fire. However, there are safe and easily retrofitted technologies that ensure the stop mechanism is rarely (if ever) needed.

This article will explain some of the main causes of belt misalignment and offers practical solutions to ensure the conveyor belt remains centred throughout the entire rotation.

What causes belt drift?

A belt can either suddenly slip out of alignment or gradually drift off centre over time. Two main conditions that cause this are operating conditions and equipment conditions. Operating conditions include environmental or application factors, such as high winds or segregated loading. Equipment conditions encompass components from idlers to the belt itself. The quality of the equipment and its ability to adapt to changes in production, like faster belt speeds and higher volumes, also play a role.

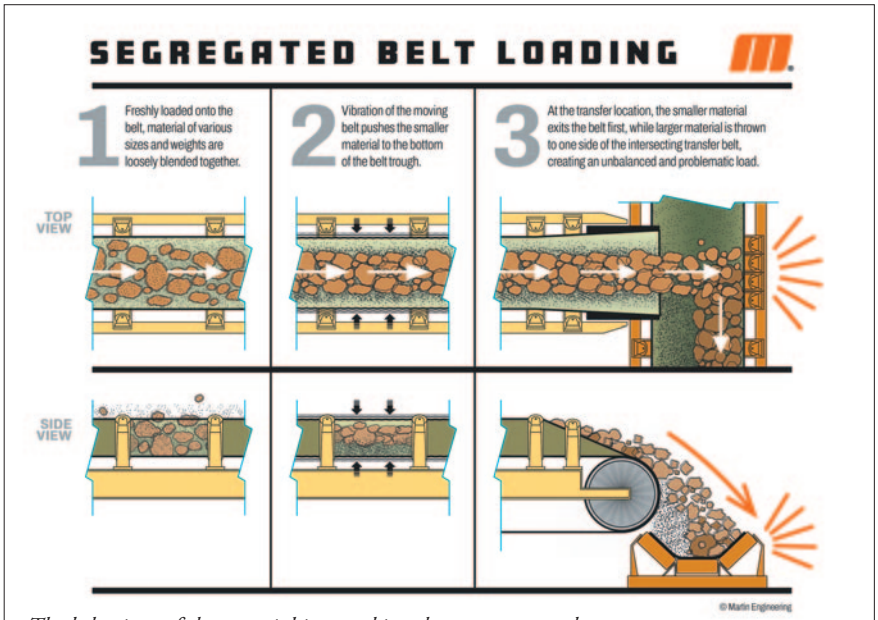
Operating conditions

- **Segregated loading:** particularly in applications like quarrying, mining, and construction and demolition (C & D) material recycling, fines can separate from larger materials and settle on the bottom of the conveyor. When transferred to a perpendicular (90°) transfer belt, larger material will settle on the far end of the belt, causing it to drift.
- **Support:** conveyors can experience regular misalignment when installed on uneven ground, soft ground, or between towers where settling can affect alignment.
- **Wind:** high velocity prevailing winds may necessitate a cover over the conveyor or pointed in the direction of common wind patterns.
- **Temperature:** extreme temperatures on one side of the conveyor can cause components to expand, leading to changes in friction and belt contact. This uneven exposure also occurs with large amounts of snow, rain, or frost, and if it persists, it might require a cover or enclosure.
- **Structure:** the structure of the system may cause misalignment due to settling into the ground or weakening over time due to constant weight and vibration. The balance and calibration should be checked periodically at multiple points along the conveyor structure.
- **Outside force:** if bumped by

machinery or affected by seismic activity, it should be tested for levelling immediately. Realignment of the structure or support may be required.

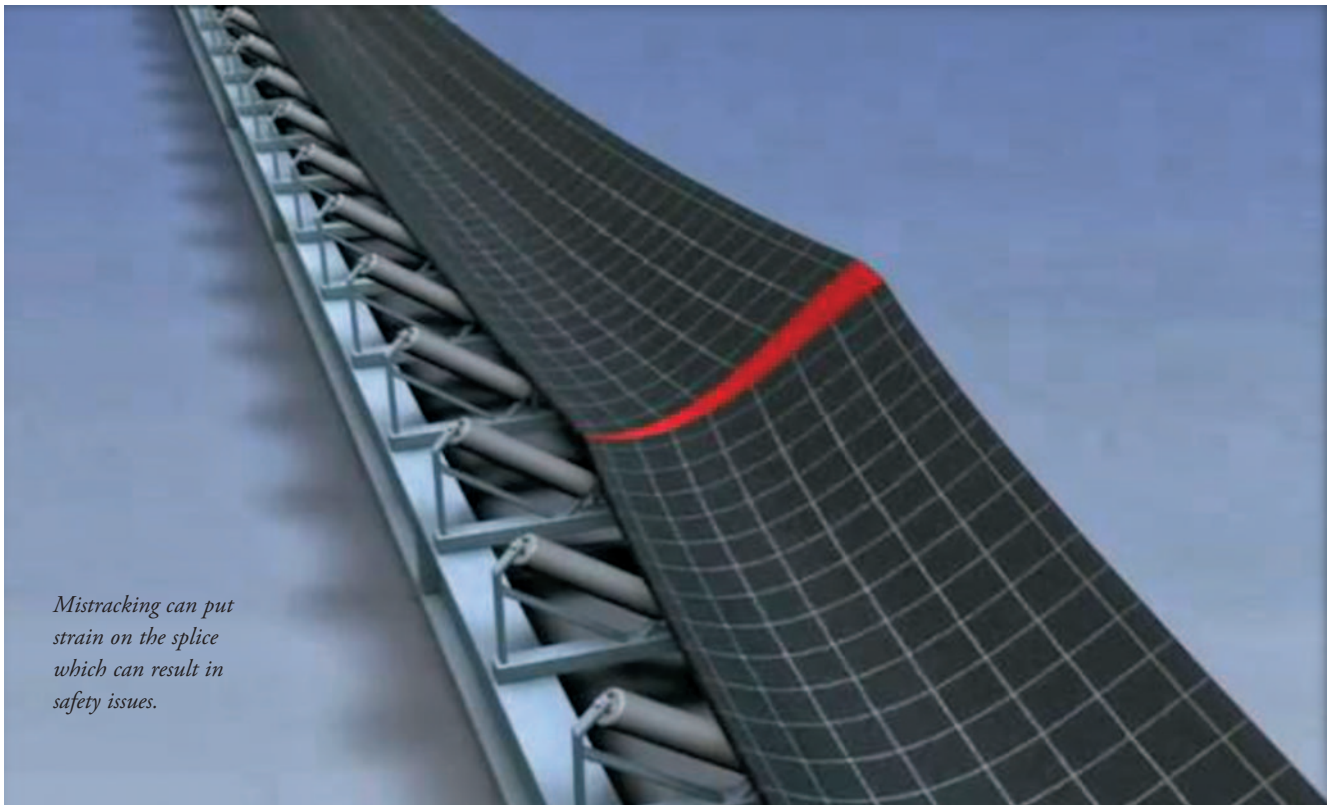
Equipment conditions

- **Idlers and pulleys:** all rolling components steer the belt. To ensure proper alignment, rolling components must be:
  - **Clean:** a fouled pulley face can cause slippage, leading to belt rippling, excessive friction, and higher power consumption. A fouled roller face may be too slick to roll.
  - **Rolling:** dust and spillage can gum up roller bearings and pulley machine parts, causing them to freeze. This can lead to increased friction, which degrades the belt and raises the risk of a belt fire.
  - **Aligned:** single idler that is slightly out of alignment can trigger drift down the belt path. Using a mallet to adjust idler supports for belt alignment is ill-advised, as it can completely throw off calibration for a new belt installation.
  - **Touching the belt:** the belt must touch all pulleys and idlers evenly to be effectively aligned.
- **Uncentred loading:** the material's centre of gravity will seek the lowest trough point. If the material is not loading centred, such as a dead drop down a transfer chute allowing splashing and shifting, the uneven weight distribution will cause the belt to drift. In this event, a scoop or spoon-shaped loading chute that slows material and distributes it at the centre of the belt is recommended.



The behaviour of the material is something that operators and design engineers need to take into account for safety.

A seized idler wears down from belt friction, creating a potential fire hazard.



Mistracking can put strain on the splice which can result in safety issues.

- **Belt and splice:** if the belt is poorly manufactured or stored improperly, it can bow or camber. Poor installation of a vulcanized or mechanical splice can result in a splice that causes belt tracking problems.

Vertical edge guides act as more of an indicator of mistracking and can create more issues due to severe belt drift.

Problems and indicators of mistracking

When the belt mistracks, the indicators will be apparent, especially if the system is equipped with a stop mechanism. The main reason for a stop mechanism is the moving belt's contact with a static frame. Aside from the expensive belt edge damage, the friction can break the splice or ignite combustible dust or cargo, potentially causing a fire or explosion.

As one side of the belt rises higher, material spills along the belt path. Cleanup requires shutting down the system so workers can do it safely. This can raise labour costs, but operators often perform this task while the belt is still running, which can lead to injuries or fatalities. Alternatively, front loaders or industrial vacuums can be used for cleanup. Only trained staff should operate this equipment because contact with the conveyor structure can throw the system out of balance and cause mistracking issues.

Like belt friction on the mainframe, frozen idlers from fouled roller faces and bearings due to spillage can carry the same potential for a belt fire. Instead of shredding the belt edge, it degrades the less-protected bottom side of the belt. Damage to one side of the belt produces the formula for mistracking. Replacing a single idler can require unscheduled downtime, as well as equipment and labor costs.

Do standard OEM conveyor belt tracking systems work?

Weight and speed are the enemies of belt tracking. The further a belt drifts, the harder it becomes to correct. Engineers studying the issue found that addressing drift immediately making micro-adjustments with automated belt trainers are more effective than standard vertical edge guides.

Vertical edge guides are smooth slots or rollers attached to the stringer, positioned perpendicular to the belt's path to prevent the edge from rubbing or cutting into the conveyor structure. Although they reduce severe friction events, they do not prevent misalignment or spillage issues and often allow the belt to roll over itself. Any significant contact with the stringer puts extreme stress on the splice and causes downstream problems that can lead to equipment failure and serious workplace safety concerns.

Why are automated tracking systems effective?

Automated tracking systems like the Martin® Tracker™, with upper units available for the carry side of the belt and lower units for return side, make micro-adjustments using sensing arms with small rollers at the end that detect minor changes in the belt's path. An existing idler set from the existing system is mounted on the steering assembly. Ideally, the rollers have rubber covers for a better grip. The thickness of the belt determines if the tracking device is medium-duty, heavy-duty, or monster-duty.

The force of the belt against the arms in any direction other than the centre adjusts the steering assembly proportionally to the belt's drift, guiding it back toward the centre. For additional steering power, the assembly elevates the steering idler approximately 10–20 millimeters (0.5 to 0.75 inches) higher than the rolls of the adjacent conventional idlers. The centre roll or pivot roll increases the belt's pressure on the tracking device, improving the corrective friction between the belt and the aligning roll.

Upper Trackers are elevated slightly above the other idlers to add more force to the steering assembly.

Alignment provided by the lower Trackers ensures the belt is centred for proper loading.

By adjusting the belt immediately, the material is more likely to shift back to the centre rather than move with the drift of the belt, which can worsen the issue. In addition, the downstream benefit is at the discharge zone, where the belt contacts the centre of the head pulley and the material stream releases uniformly down the transfer chute with less spillage. Centred discharge also enables scrapers to work more effectively at cleaning the belt.

Another technique to improve performance is to install a return belt-training system with a conventional return idler above the belt, upstream of the tracking device, to push the belt down, increasing the force on the training idler and allowing it to work more effectively.

Where to place automated belt tracking devices

Ideally, the upper tracking device should be installed after the load zone on belts wider than 42 inches (1,000mm). The force of the drop from the transfer chute and subsequent vibration can cause material — especially large raw material — to shift through the loading, settling, and stilling zones, putting more weight on one side. Due to a slight amount of belt sag, material also slightly shifts when the belt encounters idlers down the conveyor path. By adjusting the belt directly after leaving the enclosure, the material stream is steered to the centre.

Some longer conveyors may require additional units to retain alignment. To avoid units competing and contradicting each other's steering action, they should be positioned approximately 20 to 50 metres (70 to 160ft) apart. The difference depends on the weight and size of the conveyed material. To ensure the material enters the discharge zone centred, conveyor maintenance experts recommend that a unit should be placed close to the discharge zone.

Proper return roller (or lower tracking device) placement is critical. This ensures the belt encounters the take-up or gravity pulley correctly. Although there may be some drift due to sag, the belt is flat on the return, so crowned rollers that are wider at the centre help train the belt back to centre.

Maintenance experts recommend installing a lower tracking device approximately five times (5x) the belt width in distance before the tail pulley. This is essential for ensuring the belt enters the loading zone correctly aligned for efficient loading.

Lining up to safety and efficiency

Why is belt tracking so important? Safety is the main concern. A broken splice can put nearby workers in serious danger. Belt fires travelling at several metres per second can ignite an entire operation before anyone can adequately react.

Aside from lost production due to unscheduled downtime, there are also associated spillage cleanup costs, clouds of dust, and broken equipment. Mistracking is like a pest infestation. Ignoring it makes it worse and in-house solutions rarely work, so in most cases, a professional and lasting solution is required. Automated belt tracking offers peace of mind, less maintenance, safety, and a quick return on investment.

About the author

Jerad Heitzler, Training Manager / Martin Engineering

As the programme manager and lead instructor for Martin Engineering's FOUNDATIONS™ Training Workshops, Jerad Heitzler is a leader in helping the industry learn how to make the handling of bulk materials cleaner, safer, and more productive. He started with Martin Engineering as a Customer Development Representative in 2006. He soon realized his love for presentations and for teaching about conveyor systems, and so in 2010 took over management and development of the company's FOUNDATIONS™ Workshop programme. Under his leadership, the programme has expanded to offer several levels of conveyor improvement workshops around the world.

About Martin Engineering

Martin Engineering is a global expert in bulk materials handling solutions. For over 80 years, Martin has designed, manufactured and installed innovative products that make the world's foundation industries cleaner, safer, and more productive. Based in the USA, the privately owned company has drawn on its unrivalled experience and expertise to help operations improve safety, enhance material flow, reduce spillage and dust, and minimize downtime. With factory-owned facilities in 20 countries, on-the-ground presence in another 40, and a worldwide service partner network, Martin has built an enviable reputation for high performance products delivered with exceptional technical service and support. The company's comprehensive *Foundations*™ textbooks, learning resources, and training programmes are the global standard for the efficient and effective design, operation, and maintenance of bulk materials handling equipment. DCi

Major milestone for E-Crane Asia

Bayan reaches 100,000 operating hours

One E-Crane is used by Bayan on the Mahakam River.

In October 2025, E-Crane Asia announced a major milestone achieved by Bayan: the company's three E-Cranes have collectively reached 100,000 hours of successful operation. This achievement is a strong testament to both the durability and reliability of E-Crane technology, and the strength of the long-term partnership between Bayan and E-Crane.

What makes this milestone particularly significant is that these operating hours have been reached under a Full Maintenance Contract (FMC) directly with E-Crane Asia. Through this arrangement, Bayan has been able to focus fully on productive coal handling operations, while E-Crane ensures the cranes remain in peak condition.

About Bayan Group

Bayan Group is one of Indonesia's most prominent coal producers, with integrated operations covering mining, infrastructure, and logistics. The company supplies high-quality coal to both domestic and international markets and is recognized for its commitment to efficiency, reliability, and sustainable operations. Through strategic investments in infrastructure such as dedicated ports, barges, and handling systems, Bayan ensures smooth and consistent delivery of coal to customers worldwide.

Bayan's three E-Cranes

Bayan operates three high-capacity E-Cranes under the FMC:

- **Mahakam River installation:** one 2000B Series EC18264 PD-E E-Crane is barge-mounted on the Mahakam River, where it transfers coal efficiently from feeder barges to mother barges.
- **Balikpapan Coal Terminal:** two 2000B Series EC15317 PD-E E-Cranes are operating at the Balikpapan Coal Terminal, providing reliable and continuous coal handling operations at one of Bayan's key export hubs.

The Benefits of an E-Crane FMC (Full Maintenance Contract)

By choosing an FMC directly with the OEM, Bayan secures advantages far beyond standard service agreements:

- **Guaranteed high availability:** the contractual agreement specifies a minimum 95% equipment availability. In practice, Bayan's E-Cranes have achieved an exceptional availability rate exceeding 99%, proving the quality of the products as well as the reliability and effectiveness of the FMC.
- **All-inclusive consumables and spare parts:** E-Crane provides all consumables and genuine OEM spare parts, eliminating risks from non-original components and ensuring long-term reliability.
- **24/7 standby and service support:** with factory-trained E-Crane specialists available around the clock, Bayan benefits from rapid response

Bayan's second and third E-Cranes handling coal for the Balikpapan Coal Terminal.

times, minimizing downtime and keeping operations smooth. All support is coordinated directly from E-Crane Indonesia's main office and warehouse located at Centra Bizpark 2, Balikpapan, ensuring fast access to spare parts and immediate service dispatch.

- **Predictable and low maintenance cost per hour:** the FMC guarantees transparent, predictable costs, allowing Bayan to optimize the cost per operating hour with full confidence.
- **Reliable performance, maximum productivity:** regular inspections, preventative maintenance, and immediate access to factory-trained manpower keep the cranes performing at their best.

A PARTNERSHIP BUILT ON TRUST

E-Crane congratulates Bayan for achieving this 100,000-hour milestone and thanks them for their continued trust in its products and services. By choosing an FMC directly from the manufacturer, Bayan has secured not only the best technical expertise but also the assurance of maximum crane reliability with minimum downtime. E-Crane also extends its sincere appreciation to the Bayan on-site crew, whose collaboration and support have been essential in achieving this success.

E-Crane Asia remains committed to supporting Bayan's operations with reliable cranes, minimum downtime, and cost-efficient maintenance. Together, the two companies look forward to the next 100,000 hours of productive operation. In addition, E-Crane looks forward to the next step in the companies' co-operation, where four more E-Cranes will be added to Bayan's Balikpapan Coal Terminal in 2026. DCi

A further four E-Cranes will be added to Bayan's Balikpapan Coal Terminal in 2026.

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Cream of the crop

of fertilizer handling and storage solutions

Louise Dodds-Ely

The WeatherSolve difference: reducing hopper dust

I grew up in a city that has multiple stockpiles of sulphur at its port, *writes Claire Cowie of WeatherSolve Structures Inc.* When I was very young, my older sibling told me that the large yellow piles were a well-known fast-food restaurant's scrambled egg mix. For years I believed that these stockpiles were indeed scrambled egg mix. This got me thinking, how on earth did they get that mix to the restaurants?

Fast forward a few years later. I soon learned that the piles were absolutely not restaurant ingredients. My other questions still lingered.

Each year, over 120 million metric tonnes of dry bulk ingredients bound for fertilizer production, including sulphur, are moved through the world's ports. Each year this amount continues to increase.

Some components of fertilizer manufacturing are stored in enclosed spaces to reduce exposure to moisture, prevent contamination, and other environmental exposure. However, all materials still need to be offloaded when they arrive via sea.

Often, large mobile hoppers with grabbers are used to offload materials. The materials are scooped up by grabbers and then moved to hoppers or conveyor systems. Best practice is to handle these materials openly for the shortest period of time possible. However, the use of open mobile hoppers during offloading is still a necessity at many busy ports.

Dry bulk handling is notoriously dusty by nature. Add a hopper into the mix, even for a short time, and welcome to dust land. There are many dust control strategies that are used to control hopper dust such as enclosed hoppers, fogging systems, wind screens, and dust extraction systems. Oftentimes, it is a combination of multiple dust control solutions that have the biggest impact. This is where a WeatherSolve wind fence comes into play.

Integrating wind fences for dust control

WeatherSolve is no stranger to the challenges associated with dry bulk handling in port environments. When one port operation was experiencing dust related challenges, the experts at WeatherSolve were called in to help.

Coastal winds and conveyors dumping into hoppers was generating dust. The dust control solutions included both a large dry dust collector and a dry fogging system.

The hoppers were mobile and had grab type buckets that were used to transport material from the hold to the hopper. This set up made a roof type enclosure for the fogging system almost impossible. WeatherSolve was asked to apply their expertise in wind fences to help boost fogging performance and optimize dust control.

For those of you that may be unfamiliar, a fogging system sprays a fine mist of water from specialty nozzles to suppress dust particles before they blow away. The droplets of water bind to the dust particles in the air through a process called agglomeration. Agglomeration occurs when fine dust particles and water droplets collide and stick together forming larger, heavier clusters. Under the increased weight, the dust falls back down to the ground.

In fogging systems, fine water droplet spray is used to create a blanket like fog covering to encourage dust to settle. However, the dust needs sufficient "hang time" with the fog in order for agglomeration to occur. In a hopper, this can be very tricky without a wind fence enclosure to keep things in order.

By surrounding the area with a wind fence around the fogging system, the wind speeds within the enclosure are drastically reduced preventing both the fog and dust from dispersing. Typically, the wind speed is decreased by around 80% or so over localized areas.

WeatherSolve got to work on the challenge presented and, together with the dry fog experts, developed an innovative solution to help optimize the hopper fogging system. A wrap around wind fence with novel wing extensions for added dust control was designed to enclose the fogging system within the hopper. The wing extensions provided extra protection to stop dust blowing out of the grabs when they swung across the hopper. The enclosure provided sufficient 'hang time' between the dust and water droplets while also reducing the wind speed to prevent dust and fog dispersion.

The outcome was a success. The fence did exactly what it was intended to do. It boosted the performance of the fogging system leading to optimal dust control, cleaner air, and better visibility.

WIND FENCE APPLICATIONS

Dust control method	How a wind fence makes it better
Water sprinklers	❍ Improves even distribution of water in windy situations ❍ Reduces water evaporation
Buildings	❍ Wind fences as walls improve ventilation and repel rain
Tarpaulin and foam-based covers	❍ Minimize damage in strong winds ❍ Control dust when the pile is being built or reclaimed
Surfactants	❍ Reduce application amounts and frequency
Bag Houses	❍ Control the collected dust during transfer from silo to transport method (rail, truck, etc.)
Fogging systems	❍ Increase 'hang time' for agglomeration

Redefining the role of wind fences

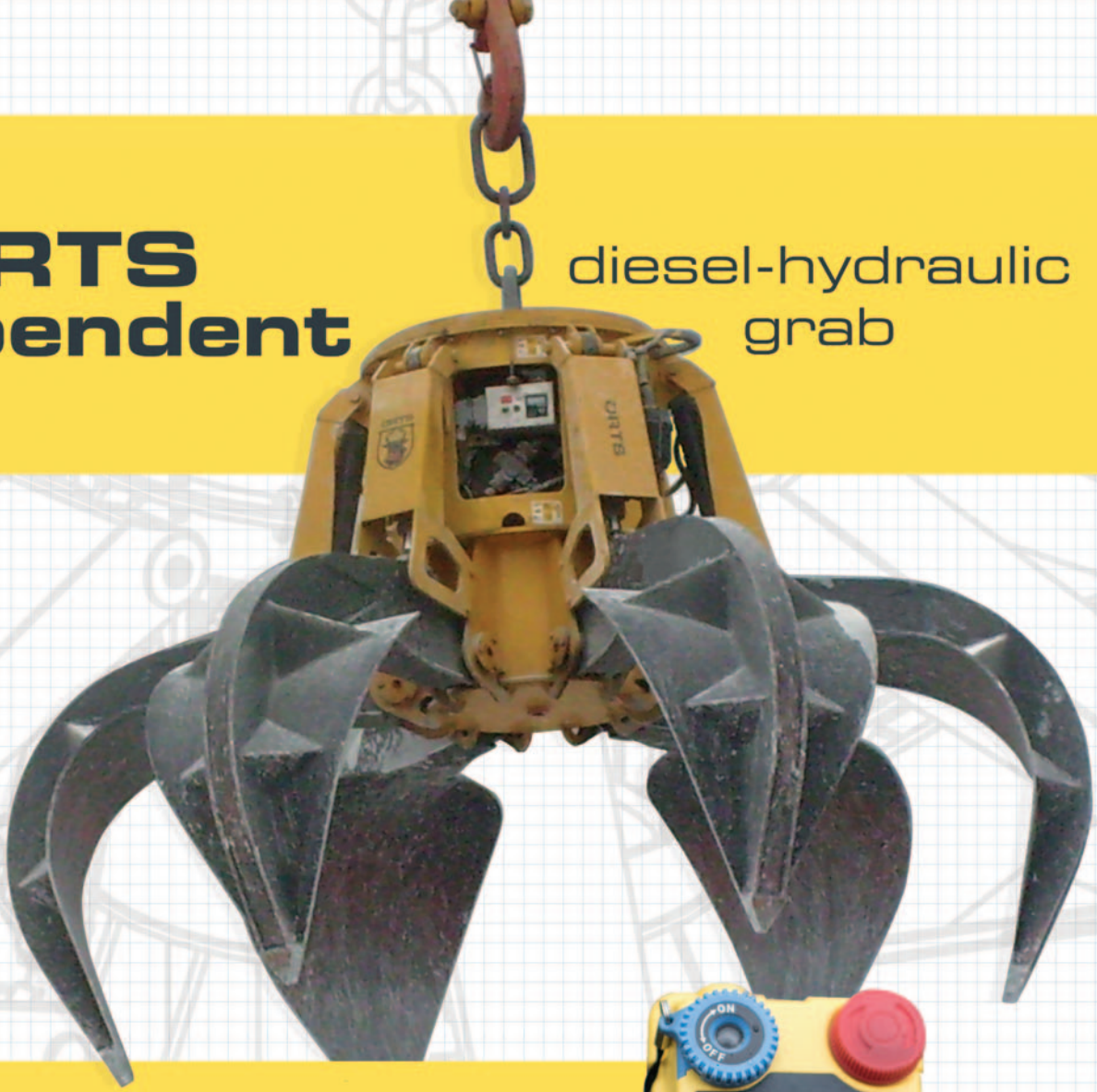
We often think of wind fences as a stand-alone strategy to manage wind and dust for mining operations, stockpiles, and other large scale industrial applications. This of course is true.

However, we also recognize that wind fences can be integrated with other dust control solutions to improve performance and operational outcomes. A well-designed wind fence isn't a one trick pony. The tabled above shows just a few examples of how wind fences make things better in industry.

WeatherSolve Structures invites readers to get in touch to learn more about how a wind fence is right for their operations. The experts at WeatherSolve Structures are always happy to share their expertise on innovative dust suppression solutions.

ORTS independent

diesel-hydraulic grab



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Truck and rail weighing of fertilizers with METTLER TOLEDO

Truck scales (weighbridges) and rail scales are frequently utilized in fertilizer production and distribution. Whether weighing the raw material inputs into the production process, or quantifying bulk shipments of finished goods, vehicle scales offer critical measurements to manage materials and transactions.

The following are some key recommendations for long-term success with vehicle weighing equipment and systems in the fertilizer industry.

Corrosion resistance

Various materials serving as inputs to fertilizer production can accelerate corrosion on metal structures, including potassium chloride, phosphoric acid, potash, and more. Loading and offloading operations can be subject to spillage of material on or around the scale. Therefore, cleanliness of the site should be a key consideration. Ensure that drainage systems around or under the scale are adequate to displace rainwater, as well as any debris and runoff that is washed from the scale deck using hoses or power washers.

Weighbridge (scale deck)

Seek a weighbridge design that limits the ingress opportunities of moisture and runoff. For example, full-welded seams in the structure can prevent opportunities for liquid ingress, while intermittent stitch-welded designs present risks for corrosion to develop in and around unwelded seams.

Cleaning debris from around the weighbridge.

Load cell system

While stainless steel load cells have become more common, not all are created equal. Consider the grade of stainless steel being used for the load cell enclosures. Be conscious of ingress protection (IP) ratings based on the nature of your site and expected cleaning processes. Also note if the system offers proactive alerts for breaches of the protective enclosures on each load cell. Such features can enable proactive repair work to be performed before the scale has any malfunctions to minimize operational disruptions.

Cables

Ensure that the cabling is well protected. Multi-layered stainless steel braiding helps prevent cable damage from rodents and cleaning procedures. Some load cells offer detachable cables (a benefit to serviceability), while others have integral cables that require replacement of the entire cell if a cable fails. In many jurisdictions, regulations require that a vehicle scale be recalibrated if a load cell is replaced, but recalibration is not required for cable replacement.

Weighing accuracy

For scales used to quantify transactions, weighing accuracy directly impacts revenue. Local Weights & Measures tolerances for legal accuracy are often not enough to

Early stage corrosion on the underside of a weighbridge.

protect a high-volume operation from the potential for significant losses due to typical accuracy drift between calibrations. Many load cells on the market are still passive devices that can experience considerable error accumulation during those intervals due to a variety of factors.

However, some manufacturers have integrated smart technology into each load cell that monitors and corrects for the variables that impact accuracy, making them much less susceptible to "hidden" weighing error.

Truck scales are long-term investment, often expected to offer an operational life of 20 years or more. Operations should quantify the hypothetical impact of 100 lbs. or 30kg. of scale error per truck over time as an example to understand if the price of a premium system will offer beneficial ROI.

Hazardous area classifications

Areas with a hazardous designation are common in fertilizer production, due to the presence of flammable or explosive materials and gases. Equipment used in those locations needs to be thoroughly vetted for compatibility with applicable requirements. For vehicle scales, that can impact component selection and include adding barrier components and other safety peripherals to the load cell network.

Ensure that your scale provider is in clear contact with the EH&S team at your site. Your safety manager should offer clarity on how the scale location is classified and requirements for service procedures taking place in those environments.

In hazardous areas, scale service technicians may require additional protective measures, confined space work permits, on-call rescue teams, and other proactive measures that can add time and cost to routine maintenance and calibrations. Ensure that your scale service provider is familiar with those requirements and prepared to meet them.

Site layout

Safety and efficiency at your site can be heavily influenced by planning for adequate manoeuvrability of trucks utilizing the scale. Ensure that your scale yard offers:

- **Staging area for trucks waiting to enter the scale:** intended to prevent

Weighing accuracy is largely dependent on the scale's load cell system.

traffic backups onto roadways

- **Scale entry:** ideally equal to the length of a typical truck, allowing it to line up straight with the scale
- **Scale exit:** also ideally equal to the length of a typical truck, allowing all axles to clear the scale deck, ramp (if equipped), and any obstructions prior to making turns

Workflow automation

Managing transaction records at the scale can be done in many ways, but modern tools present opportunities to streamline the process, eliminate the risk of human errors, and expand the accessibility to the scale beyond normal business hours.

- **Transaction management software:** a software package that connects to the scale indicator to automatically capture weight information, also serving as a database for driver and/or vehicle records. A prime example available on the market is the DataBridge™ from METTLER TOLEDO.
- **Driver-controlled kiosks:** a drive-up unit mounted alongside or adjacent to the scale, allowing drivers self-service for weighing transactions. The IND9U Unattended Terminal Family is ideal for this purpose.
- **Identification tools:** especially helpful for fleet operations, RFID and barcode readers can replace manual check-in processes for known vehicles.

Weigh-in-motion

High-volume sites can gain further efficiency by utilizing WIM (weigh-in-motion) systems.

- **Truck weighing:** capture accurate weighments as trucks drive across the weighbridge at low speeds, with no requirement to come to a stop. The TruckPass™ Weigh-in-Motion from METTLER TOLEDO is an excellent choice.
- **Rail weighing:** coupled-in-motion (CIM) systems allow connected railcars to be weighed while in-motion across the rail scale, greatly reducing the time and resources required to perform static weighing of individual railcars. METTLER TOLEDO's Coupled-in-Motion Railroad System perfectly fits the bill.

Scalehouse software and data input peripherals add security and efficiency to processes.

Conclusion

Vehicle weighing systems have become integral to fertilizer production and distribution. Whether your focus is on equipment longevity, measurement accuracy, operational efficiency, or all of the above, today's scales systems can offer much more than their predecessors. Ensure that your scale provider is discussing each of these topics with your scale team to prepare your site for success today, and years into the future.

About METTLER TOLEDO

METTLER TOLEDO is an experienced global supplier of precision instruments and services. It holds strong leadership positions in all of its businesses and it believes itself to be at the top in most of these markets. METTLER TOLEDO is recognized for the strength of its innovation, and its solutions are critical in key R&D, quality control, and manufacturing processes for customers in a wide range of industries including life sciences, food, and chemicals.

Growth industry: conveying fertilizer presents a variety of tough challenges

"Two out of every five people on Earth today owe their lives to the higher crop outputs that fertilizer has made possible" — Bill Gates.

A study examining global trends in fertilizer efficiency and crop production from 1961 to 2022 reveals a 60% increase in fertilizer use. This growth shows no sign of abating, so fertilizer continues to be increasingly important to the bulk handling industry. Although a

number of bulk cargoes present tough challenges for rubber conveyor belts, from an operational and safety point of view, fertilizer is easily one of the toughest. *Simon Neville explains* the most important attributes of belts used to convey fertilizers and the pitfalls of corner-cutting.

Synthetic rubber can be engineered to cope with a multitude of demands.

A combination of challenges

There are many different types of rubber compound used for rubber multi-ply belts because, depending on the type of industry, they have to deal with a multitude of different (and often combined) demands including resistance to abrasive wear, heat, oil, chemicals, ozone and fire.

The rubber compounds (commonly referred to as 'cover grades' or 'cover qualities') are almost entirely synthetic because not only is it appreciably less expensive and much more adaptable than natural rubber, it can be engineered using various chemicals and substances to cope with a wide range of demands. While most industries only require one or two different forms of resistance, the fertilizer industry needs them all.

Oils and chemicals

The first big challenges are the numerous oils and chemicals, including acids, contained within different types of fertilizer and those used in its production processes. When oil penetrates rubber it causes it to soften, swell and distort. The time it takes to have a detrimental effect depends on the oil-resistant properties of the belt.

Inadequate oil resistance causes a dramatic decrease in the ability of the rubber to withstand abrasive wear. As the rubber continues to soften it also steadily loses its tensile strength while at the same time becoming prone to ripping and tearing

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under the slightest provocation. The next stage is that the swelling and distortion of the rubber begins to cause steering and handling problems along with a serious reduction in the amount a belt can stretch before it snaps. A common and expensive symptom of this reduced elasticity is recurring splice joint problems.

Vegetable-based oils

There are two distinct sources of oils that damage rubber — mineral and vegetable/animal, each of which has its own particular effects on rubber. For conveying fertilizers containing vegetable oil, belts should have outer covers that are based on a combination of SBR (Styrene Butadiene Rubber) and NBR (Nitrile Butadiene rubber). Good quality SBR has excellent resistance to wear combined with very good tensile strength. This helps to ensure that the rubber is durable and long-lasting and better able to cope with ageing and other demands.

The inclusion of nitrile in the rubber compound provides the essential resistance to the damaging effects of oil. However, because of the high cost of nitrile butadiene, manufacturers who compete for market share on the principle of lowest cost rather than resilience and longevity, prefer to use low-grade nitrile, often in the lowest possible quantities or, as laboratory tests consistently confirm, not at all. The result is a belt that, although claimed to be oil resistant, actually has limited resistance at best.

Mineral oils and chemicals

Mineral oil tends to be much more aggressive compared to vegetable oil, so a full Nitrile butadiene rubber based synthetic rubber (NBR) is required. The greater the concentration of nitrile within the polymer, the greater the oil resistance.

Serious distortion – the effect of oil on a flat rubber belt.

This is especially important when conveying fertilizer because nitrile also provides protection against other aggressive chemical elements such as sodium hydroxide and potassium hydroxide, nitric acid and ammonia and Urea Formaldehyde (used as an anti-caking and de-dusting agent) and ammonium nitrate solutions that consist of waxes and oils and other chemicals such as amines.

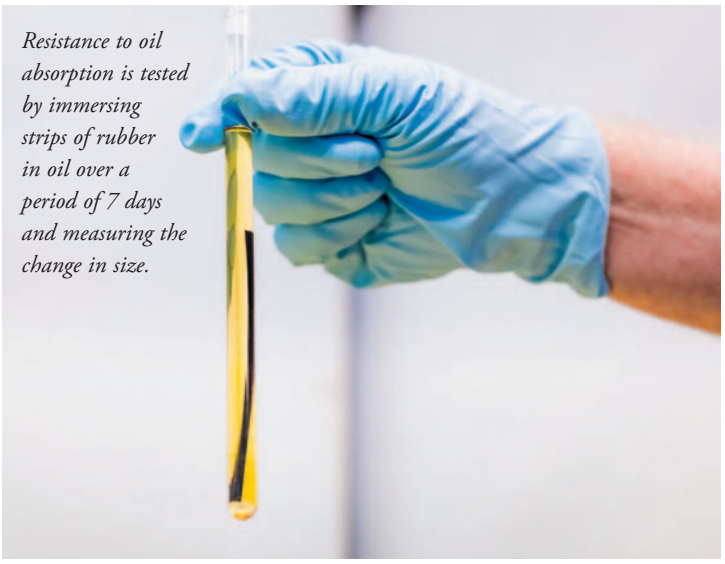
Buyer beware: Some manufacturers create a false sense of security by using the DIN reference number 22102 G when referring to oil resistant belting.

This is deceiving because there are no firm requirements, test methods or limits specific to oil resistant belting associated with DIN 22102 G.

Most conveyor belt manufacturers only offer one type of oil-resistant rubber cover, usually referred to as 'MOR' (moderate oil resistance). Although probably a fairly safe option when dealing with vegetable oil in cargoes such as grain, such a level of oil resistance often proves inadequate when conveying fertilizers containing a high concentration of mineral oil and fertilizers such as phosphates and urea that have been treated with an oil-based coating to prevent the granules sticking together.

Handle with care

Granulated fertilizers are generally easier to handle than blended fertilizers, which can separate and 'cake' when moved. Blended fertilizers can also create dust, which can be explosive if ignited. It is therefore essential that the conveyor belt cannot create static electricity that could ignite the atmosphere. Belts need to be able to allow static electricity to pass



Resistance to oil absorption is tested by immersing strips of rubber in oil over a period of 7 days and measuring the change in size.

Rubber conveyor belts can never be totally fireproof.

through the metal frame of the conveyor structure down to earth rather than allow static to build up. The safest approach is for all belts to meet EN 12882 Category 1, which contains the standards for electrical and flammability safety requirements for general purpose conveyors used above ground. Category 1 is the most basic classification and simply demands that the belt is anti-static. This means that the belt meets the primary requirement for use in ATEX 114 (Directive 2014/34/EU) classified zones if necessary.

Fire safety

All rubber belts used to convey potentially inflammable and/or combustible materials should be able to resist fire. Rubber conveyor belts can never be totally fireproof. Rubber is flammable and the synthetic fabrics used in the carcass have virtually no resistance to fire so all belts will be damaged or destroyed by fire. Therefore, the true essence of fire-resistant belting is that it will self-extinguish and not continue to burn when the source of ignition is removed and therefore not contribute to the spreading of a fire.

The ability of a rubber conveyor belt to self-extinguish is achieved by adding special chemicals and additives to the rubber compound during the mixing process. Once the vulcanized rubber is ignited, the additives emit gases that effectively suffocate the fire by starving the flames of oxygen. The speed at which this takes place is crucial because moving conveyors can carry the flames and spread the fire, so literally every second counts.

Fire resistance standards and test methods

The EN12882 standard is for safety requirements for conveyor belts for general-purpose, above ground applications and describes a range of classes from '1', '2A", '2B' up to '5C'. As most transshipment conveyors are used to convey a variety of bulk materials and which vary in their degree of flammability, 'S' grade (EN 12882 Class 2B) should be regarded as the default standard. The test method used for all classes up to and including Class 5C* is EN ISO 340, which involves exposing six individual samples of belt to a naked flame causing them to ignite. The source of the flame is then removed and the time it takes for the belt sample to self-extinguish is then measured. (*Class 3A and above require tests in addition to EN ISO 340).

EN ISO 340 testing.

The duration of continued burning (visible flame) should be less than 15 seconds for each sample with a maximum cumulative duration of 45 seconds for each group of six tests. This means that the average allowable time per sample is 7.5 seconds. This factor is of paramount importance because a belt can easily travel more than 40 metres within the 15 seconds that is allowable for a belt sample to pass the test, which is a potentially very dangerous distance. Fenner Dunlop in the Netherlands, considered by many to be the pioneer of fire-resistant conveyor belting, applies an average maximum time limit standard of only one second, which is more than six times faster than the required standard and therefore decidedly safer.

Covered conveyors

To preserve fertilizer bulk quality, including keeping the product dry, covered conveyors are often used. However, the risk to human life is higher in enclosed environments because burning rubber releases thick toxic smoke that contains, among other things, cyanide, carbon monoxide and sulphur dioxide.

The best choice for conveyors operating in closed or covered conditions is therefore usually EN 12882 Class 4A because in addition to EN ISO 340 testing it involves a more severe fire test according to EN 12881-1 method A, C or D.

Exposing the weaknesses

To some, fertilizers may seem to be an undemanding cargo but for rubber conveyor belts, they are more than capable of exposing the slightest weakness in the quality of the rubber. As a result, their working life is much less while their whole life cost is much higher. My best advice is to avoid the mass-produced versions made in Southeast Asia and opt for European quality brands that you can trust. As is proved so often, the lowest price can come at the highest cost. *Simon Neville*

Class 4A involves a more severe fire test according to EN 12881-1 method A, C or D.

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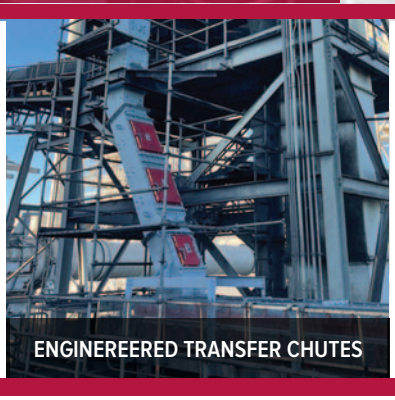
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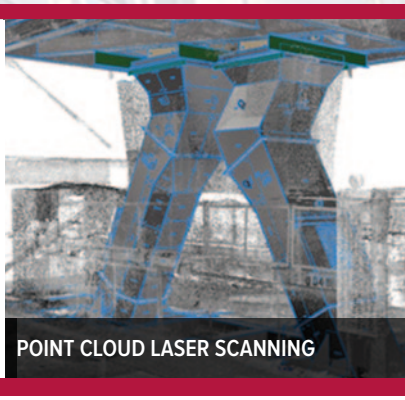
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Winning the facility corrosion battle

Fertilizer storage buildings can fight corrosion with PVC fabric and epoxy-painted I-beams

Everybody in the fertilizer distribution business understands that a storage facility could be vulnerable to the caustic nature of the materials being housed, *writes Paul Smith, Legacy Building Solutions*. However, not everyone may be aware of all the options manufacturers provide to optimize corrosion protection.

It's well known in the industry that fabric cladding is a cost-effective choice for fertilizer storage structures, since such buildings can provide ample square footage at a fraction of the price of a wooden building. Fabric's natural resistance to corrosive elements, in contrast to metal buildings, is another key factor in choosing fabric structures for fertilizer applications.

Historically, the metal framing systems for tension fabric structures have still been vulnerable to corrosion, even if the cladding is not. However, leading fabric building manufacturers like Legacy Building Solutions have worked hard to offer new innovations that help fight corrosion for those in the business of storing fertilizer.

Steel I-beams with epoxy

Traditional fabric structures used truss frames that had hollow tubes. This meant that corrosion could originate inside the tube and rust the frame from the inside out, even if the exterior surface of the truss had been treated in some way. A big move forward for the fabric building industry occurred when Legacy developed a patented method for attaching fabric panels to a structural steel frame. Solid I-beams had now replaced hollow tubes.

For fertilizer storage applications, hot dip galvanizing was the most common method used to protect steel beams against corrosion. Galvanizing typically adds a 3.9-mil layer of zinc over the steel by immersing the entire beam in a molten zinc bath. This zinc layer is essentially sacrificed over time – the steel beneath is protected while the zinc is eaten away by corrosion. In effect, galvanizing slows down corrosion but doesn't fully stop it in the long run.

To provide superior corrosion protection and increase the longevity of fertilizer handling facilities, manufacturers have turned to epoxy paint. Unlike galvanizing, which loses its effectiveness over time, epoxy creates a permanent barrier between the building's steel framing members and the corrosive elements trying to attack them.

Epoxy has considered a premium upgrade for years because of the costs involved in producing and shipping the coated steel. To make this coating affordable, suppliers like Legacy invested in their on-site production facilities so they could take control of their own steel beam fabrication and painting.

Treatment process and testing

Before applying epoxy, the process starts by steel-shot blasting the I-beam in a controlled environment to create a consistent blast profile across the entire steel surface. For the highest level of corrosion protection, the steel receives a commercial blast to remove defects or impurities and totally clean every inch of steel.

If this blast process didn't take place, the steel could experience a filiform type of corrosion that can develop underneath the protective coatings. Hot dip galvanizing, by contrast, involves no blast. The steel is usually just wiped down before being dipped, which means that any potential contaminants or blemishes aren't addressed prior to the beam being coated.

After blasting occurs, the next step is using a paint method – not dipping – to add a 3-mil layer of zinc to the steel. This paint layer is similar to the protection offered to a final product that is hot dip galvanized, but in this case that's only the first level of protection. Two separate 5-mil coats of epoxy are then layered on top of the zinc paint. In total, the I-beam has a fully protective 13-mil barrier that keeps the corrosive dust of fertilizers from ever directly meeting the steel.

To evaluate the effectiveness of an epoxy coating's corrosion protection delivered to a steel I-beam, manufacturers have put this method in a side-by-side comparison with hot dip galvanizing. Where some corrosion tests will try to emulate typical working conditions, a

2,000-hour salt fog test developed by the American Society for Testing and Materials (ASTM) introduces a constant, aggressive salt fog to materials to ensure they can meet the highly corrosive challenges of applications like fertilizer storage.

In one specific 2,000-hour test, an epoxy-coated steel beam and hot dip galvanized beam were each placed in the same closed, controlled testing environment. Upon the test's conclusion, the galvanized steel came out fully corroded. The epoxy-coated steel was clear of corrosion, except for a thin line that had been intentionally etched beforehand to see if the coating would help prevent rust from spreading into the rest of the beam; even in the purposely damaged area, the corrosion did not penetrate below the coating.

Structural engineering advantages

It's easy to see why Legacy and other suppliers go to painstaking lengths to protect steel beams from corrosion. It's because the incorporation of rigid-frame, structural I-beam engineering has been a total game changer for tension fabric buildings.

Rigid-frame design instantly brought a universally accepted engineering practice to fabric structures. The fact is that web truss framing was lacking in both quality and consistency. The new I-beam approach also gave building users the ability to completely customize a tension fabric facility, allowing for precise building dimensions and the inclusion of unique features.

For fertilizer storage specifically, distributors often desire large square footages. Large-scale fabric-clad facilities can be built at a much smaller cost than comparable wood buildings. Engineered steel I-beams deliver more structural strength as well, which allows for long clear span designs that offer more wide-open floor space for material pile arrangements, mixing tasks, and for the safe operation of load-in and load-out equipment.

When designing a fabric structure with a rigid frame, the process always starts with a clean sheet, where the customer sits down with the manufacturer's engineers to optimize the project from the beginning for their exact operational needs. If the building needs an overhead conveyor or other collateral loads added that will need to be mounted to the structural frame, the engineering team apply those parameters in the design software to ensure the depth and thickness of each I-beam is optimized.

It's also important to note that tension fabric buildings be ventilated to stay dry without any difficulty. A standard rigid-frame structure could incorporate low-cost passive systems utilizing ridge and soffit vents that use the natural movement of warm air.

Passive systems are often sufficient to address moisture and humidity ventilation concerns. For situations where fans or other mechanical ventilation might be needed, those items can be hung from the steel frame.

Fabric doesn't corrode

Corrosion is a non-factor when it comes to the fabric material itself, whether using polyvinyl chloride (PVC) or polyethylene (PE). Because architectural fabrics aren't vulnerable to corroding, they're naturally a popular selection for fertilizer storage structures.

Fabric provides other advantages, too. Its translucency allows the inside of a building to be naturally illuminated during daylight hours. Fabric has thermally non-conductive properties as well, which helps to keep the facility's interior environment cooler in the summer and warmer in the winter.

The type of fabric used can have a sizeable impact on the structure's overall longevity. PVC historically was much more expensive than PE, but Legacy's Exxotec PVC cladding is a high-quality offering that is available in the same cost ballpark as PE. This advanced PVC features a high-strength woven fabric with additional primer and lacquer layers that is designed to retain more than double the tensile strength of a standard PE fabric. This subsequently provides the facility with a longer life expectancy.

Improved fabrics, solid I-beam framing, and superior coatings for steel have combined to combat facility corrosion in all directions. By applying the proper protective measures and using custom engineering to meet the user's exact needs, tension fabric buildings provide a cost-effective and long-term solution for fertilizer storage applications.

Keeping fertilizer moving: how industrial vibrators turn stockyard capacity into reality

A well-run stockyard is the backbone of any dry bulk operation, and few materials put that system to the test quite like fertilizer. Every year, millions of tonnes of urea, MAP, DAP, potash, and blended products move through ports, terminals, tenders, and distribution hubs. Yet before they ever reach a farm field, they battle operators at every stage by doing one thing exceptionally well: refusing to flow.

Fertilizer is hygroscopic and prone to absorbing moisture, which causes caking and the formation of hard plugs inside hoppers and chutes. These plugs bridge, rathole, cling to walls, and pack tightly during storage or transport. Even equipment engineered for gravity discharge often struggles when fertilizer compacts into dense, unyielding masses. The result is slower reclaim, more dust, greater labor demands, and an overall drag on a stockyard's efficiency.

Restoring flow through vibration and air blasting

The solution is not to redesign entire systems but to introduce controlled energy where it matters most — through rugged industrial vibrators and well-placed air blasters. Vibration tackles the problem at the material level by reducing internal friction. When a vibrator is mounted rigidly to a hopper or discharge chute, its energy carries through the steel and into the product, breaking cohesive bonds and allowing gravity to regain control. For granular potash, urea, and NPK blends, properly selected vibrators can reestablish mass flow quickly and keep material moving throughout the discharge cycle.

In more challenging situations — particularly humid or coastal environments — fertilizer can form thick crusts or stubborn buildup on walls. Air blasters add targeted force by delivering a sharp burst of compressed air that knocks loose accumulation and cleans the vessel interior. Global Manufacturing's blasters are engineered for corrosive fertilizer environments, featuring coated valves and compatibility with standard compressed air or inert gases such as nitrogen. Together, vibrators and air blasters offer operators a flexible, non-invasive way to maintain flow without manual clearing or equipment overhauls.

From farm equipment to marine terminals: power for every scale

Reliable flow becomes especially critical in mobile agricultural equipment, where planting schedules depend on uninterrupted discharge. Many major farming equipment manufacturers specify Global's C2 vibrator for tenders and spreaders because it is compact, durable, and powerful enough to break compacted fertilizer without crushing granules. Operators rely on the C2 season after season to deliver consistent flow regardless of weather or product condition.

At the opposite end of the spectrum are the massive hoppers, chutes, and reclaim systems found in ports and on self-unloading vessels. In these heavy-duty environments, the forces required to move compacted or moisture-laden fertilizer are significantly greater. Here, Global's Design Series hydraulic vibrators excel. Hydraulic rotary units provide controllable frequency and high output — ideal for the toughest fertilizer applications where continuous-duty reliability is essential. They deliver smooth, powerful energy that restores mass flow without overstressing steel structures or increasing dust emissions.

Among these products, the epoxy-painted D4.5 hydraulic vibrator stands out as a marine-grade workhorse. It is widely used by leading self-unloading ship companies and integrated into hopper designs by major shipbuilding engineering firms. Onboard vessels, fertilizer often compacts heavily during long voyages or humid conditions. The D4.5 delivers sustained power that prevents hang-ups, keeps conveyors fed, and ensures fast, predictable unloading from port to port. Its reputation for ruggedness and performance has made it one of the most trusted solutions in global marine fertilizer handling.

Engineering support that translates to real-world throughput

Hardware alone does not guarantee success — proper application is equally important. Global prioritizes practical engineering guidance, helping OEMs and operators select appropriate force levels, choose effective mounting methods, and position vibrators to promote full mass flow rather than funnelling. Many facilities pair vibrators with air blasters for targeted cleaning of buildup-prone surfaces.

This expertise is reinforced by decades of fieldwork. Global's CEO, Catherine Janosky, spent years visiting self-unloading ship terminals to help crews optimize vibrator placement. Her work has directly contributed to the reliability and effectiveness of vibrators aboard marine vessels worldwide.

The payoff for proper flow management is significant. Stockyards that maintain smooth, predictable fertilizer movement experience fewer stoppages, safer operations, and lower maintenance costs. Conveyors remain consistently fed, dust decreases, ship turnarounds accelerate, and inland terminals can move higher volumes during peak demand.

As fertilizer volumes grow and delivery windows tighten, reliable flow becomes essential. Whether in a tender rolling across the heartland or a deepwater port unloading ships at full capacity, the combination of industrial vibrators and air blasters—powered by proven products like Global's C2 and D4.5—keeps fertilizer moving at the pace modern agriculture requires.

Industrial vibrators don't simply assist fertilizer handling; they make high-performance stockyards possible.

Unloading from railcars made easy with vibrators from Global Technics

Global Technics develops and manufactures equipment to accelerate the unloading of railcars carrying bulk cargo (cement, fertilizers, minerals, salt, raw sugar, concentrates, etc.). Its vibratory unloaders are mainly used in ports and terminals, as well as at enterprises with large volumes of bulk materials unloaded from railcars. The use of these devices can speed up the unloading process by up to 300% in some cases. This reduces time and labour costs.

The most popular unloader model, the VH-500, has been on the Eastern European market since 2017 and is currently the most powerful vibration system designed for unloading hopper-type railway wagons. The unloader is powered by compressed air and can be integrated into any wagon unloading system (including a wagon tipper for cleaning the wagon after unloading).

VH-500 vibratory unloaders can also be used to compact cement and similar materials when loading railway wagons. This allows more cement to be loaded into the wagon, resulting in savings on transport costs.

About Global Technics

GLOBAL TECHNICS OÜ is an engineering company with over 15 years of experience in the development and manufacture of high-end bulk material unloading equipment. Its pneumatic vibratory hammers are an indispensable tool for accelerating unloading, removing obstructions in the storage and handling of bulk materials, and optimizing operational efficiency.

Global Technics serves a variety of industries, including ports, terminals and companies specializing in fertilizer, cement, metals and more. Furthermore, its equipment is in high demand in the mining, chemical and construction industries.

Global Technics helps its customers with their bulk material handling needs, and enables them to maximize the efficiency of their unloading operations with cutting-edge pneumatic vibrators and see a significant boost in productivity and efficiency.

From ship to soil: why fertilizer handling now decides regional food security

Fertilizer is one of the most critical inputs in global agriculture, underpinning nearly 40–60% of all crop yields worldwide. As the world's population heads toward 9.7 billion by 2050, the demand for nitrogen, phosphate, and potash continues to rise — and so does the pressure on the supply chains responsible for moving them. Today, the global fertilizer market is valued at roughly US$200–210 billion, with projections reaching US$240–250 billion by 2030, driven by population growth, soil nutrient depletion, and the intensifying need for yield resilience.

Yet behind every bag of urea, DAP, or MOP lies a highly technical, high-risk, and time-sensitive handling process. Fertilizer is rarely produced where it is consumed. More than half of all fertilizer used in Africa and Asia is imported, making ports, terminals, and inland depots the backbone of regional food security. The equipment and systems deployed at these locations — from cranes, conveyors, and hoppers to mobile bagging lines and sealed storage — directly determine whether crops are fed on time or whether the supply chain falters.

The hidden complexity of moving fertilizer

Unlike most bulk commodities, fertilizer is uniquely sensitive to environmental conditions. Even small changes in humidity, temperature, and handling method can degrade product quality, disrupt trade, and strain supply chains.

Key challenges include:

- **Moisture absorption:** urea, NPK blends, and MOP are hygroscopic; even minor humidity exposure can lead to caking and reduced quality.

- **Accuracy requirements:** precision matters — errors beyond ±0.2% in bagging and weighing can impact commercial value and contract outcomes.
- **Contamination risks:** dust emissions, unsealed transfers, and cross-contamination compromise product integrity and environmental compliance.
- **Safety concerns:** certain fertilizers, such as ammonium nitrate, require strict control measures during handling and storage.
- **Port congestion:** many emerging markets rely on general cargo berths for fertilizer imports, creating pressure on berth availability and operational speed.

These complexities elevate the need for controlled, efficient, and flexible handling solutions, particularly in coastal environments with narrow weather windows and high humidity.

Mobile solutions: accelerating access where it matters most

A significant shift in fertilizer logistics is the move toward mobile, modular, and rapid-deployment systems. As fertilizer imports grow faster than fixed-port infrastructure expands, countries increasingly rely on adaptable solutions that can be deployed quayside, warehouse-side, or inland with minimal setup time.

Mobile bagging lines, modular conveyors, and flexible storage systems help reduce port dwell time, protect cargo quality, and allow operators to react quickly to seasonal spikes or berth shortages.

With operations across 65+ ports globally, IMGS Group has established itself as a leading provider of end-to-end fertilizer handling, bagging, storage, and distribution solutions. The company manages more than nine million metric tonnes of dry bulk annually, including major fertilizer commodities such as urea, NPK, DAP, CAN, and MOP.

Recent regional highlights include:

- **West Africa:** urea and NPK bagging using high-speed one-tonne and 50kg lines, deployed across both port and inland terminals to maintain uninterrupted supply during peak import cycles.
- **East Africa:** direct-discharge systems enabling rapid unloading and dispatch into trucks for immediate nationwide distribution.
- **Asia:** one-tonne IBC bagging for potash and urea conducted under monsoon conditions using moisture-controlled equipment setups.
- **Middle East:** integrated storage, reprocessing, and high-capacity bagging operations supporting both imported and re-export fertilizer markets.

Across these regions, IMGS' mobile fertilizer handling solutions offer speed, accuracy, and operational resilience — traits increasingly essential as climate variability, seasonal demand fluctuations, and global price volatility reshape the fertilizer landscape.

The road ahead: moving fertilizer without compromise

As fertilizer demand grows and climate and regulatory pressures intensify, the future of fertilizer logistics will be defined by operators who can deliver speed, precision, and protection across every stage of the supply chain. Stricter environmental standards sealed and dust-controlled transfer systems, higher weighing accuracy, and the rise of automation will push ports and inland terminals toward more controlled and technology-driven operations.

Hybrid terminal models — combining permanent storage with mobile, rapid-deployment capabilities — will become increasingly valuable. Meanwhile, innovations in moisture control, enclosed conveyors, and real-time monitoring will further enhance product integrity and operational stability.

For IMGS Group, this is not a vision of the future — it is the standard already in practice. Across every berth, warehouse, inland depot, and loading point, IMGS ensures fertilizer moves from ship to soil with speed, accuracy, and complete integrity, supporting the agricultural systems that millions of people rely on every day.

NEGRINI S.R.L.
since 1967

Negrini company, established in 1967, specializes in engineering and manufacturing a comprehensive range of grabs and buckets for rope machines and crawler mounted cranes; they are employed to do many jobs. Negrini buckets and grabs are very well-known for quality as well as for the very accurate and skilful engineering work; in fact Negrini supports their clients by analyzing the job to be done and, if needed, by adjusting the standard design of grabs and buckets to enhance their performance once in operation.

VIA TORRICELLI 4 - CASTELFRANCO E. (MO) - ITALY

Flow first: how reliable bulk solids handling improves fertilizer production, storage, and shipping efficiency

Global fertilizer production and trade continue to grow, driven by the constant need to improve agricultural yields, *writes Denis A. Ferreira, Senior Project Engineer, Jenike & Johanson*. Yet despite major advances in manufacturing capacity, logistics, and automation, one persistent issue undermines efficiency across the entire supply chain: unreliable material flow. From production plants to bulk storage terminals, fertilizers present unique handling challenges. Hygroscopicity, caking, and dust generation frequently cause unplanned stoppages, product losses, and safety risks. In many cases, processing equipment is not the bottleneck — the flow behaviour of the fertilizer itself is.

For Jenike & Johanson (Jenike), an engineering consultancy specialized in bulk solids handling, the message is clear: reliable flow is the foundation for productivity, safety, and environmental performance in fertilizer handling systems. When materials move as designed, every subsequent process — from unloading to storage — operates at peak efficiency.

Understanding fertilizer flow challenges

Fertilizers behave very differently from free-flowing bulk solids such as soybeans and corn grains. Their sensitivity to moisture, particle degradation, and compaction means that even small variations in humidity or temperature can turn a predictable process into an operational headache.

- **Caking and cohesion:** many fertilizers, particularly urea and ammonium-based products, absorb moisture from the air. As particles stick together, the material forms hard lumps that may block chutes, hoppers, and feeders.
- **Ratholing and arching:** in storage silos and warehouse, with gravity reclaim, fertilizer may flow through a narrow channel while large stagnant zones remain stationary. These erratic discharge patterns reduce live capacity and create sudden surges that overload conveyors or bagging systems downstream.
- **Dust generation:** fine fertilizer particles easily become airborne during discharge or transfer, increasing environmental and health concerns and leading to product loss.
- **Variable flow with humidity:** a system that performs well in dry weather can fail completely under humid conditions, forcing operators to rely on mechanical interventions or manual cleaning.

Each of these behaviours, but not restricted to them, affects equipment throughput and reliability. Poor flow not only slows operations but also shortens equipment life, increases maintenance frequency, and compromises worker safety.

Where handling systems struggle

Loading and unloading operations

Fertilizers move through a variety of systems — grab cranes, hoppers, chutes, storage halls, railcars and shiploaders — often designed for commodities like grain, coal or iron. When these systems handle fertilizer, the differences in flow behaviour become apparent: hoppers arch, material hangs on walls, and discharge rates fluctuate unpredictably.

At ports, the impact is immediate. A discharge hopper that plugs every few hours or material builds ups rapidly, impacting grab cranes discharge, can add days to a vessel's unloading schedule, increasing demurrage and energy consumption. Within production plants, erratic flow through feed hoppers can disrupt blending ratios and production rates.

Jenike's approach begins with testing representative fertilizer samples to measure flow properties such as cohesive strength, wall friction, bulk density, and permeability, among others, under representative controlled humidity and temperature conditions. The resulting data allows engineers to design optimized hopper geometries, outlet sizes, and liner materials that ensure uniform and steady discharge — known as mass flow. Mass flow is a flow pattern where all the material is in motion during discharge. Mass-flow hoppers eliminate stagnant zones, minimize segregation effects by sifting mechanisms, and provide consistent feed to downstream systems.

When new designs are not feasible, retrofit solutions — such as flow inserts, geometry modifications, improved wall surfaces, or controlled-flow feeder interfaces — can transform underperforming hoppers without major reconstruction. In both new and existing facilities, measured design parameters replace guesswork, improving reliability and safety from the first load onward.

Storage systems

Large silos and bins are critical links in fertilizer plants and port and railway terminals, yet they are also frequent sources of downtime. Common symptoms include caking, erratic discharge, and dangerous build-up that requires manual intervention.

Contrary to popular belief, simply enlarging an outlet or steepening a hopper wall angle does not automatically fix flow problems. Bulk solids do not behave like liquids — greater pressure often reduces, rather than improves, flow reliability. At Jenike, reliable storage design starts with flow property testing and engineering analysis, not assumptions. Laboratory-measured parameters — such as cohesive strength, wall friction angle, and compressibility — are combined in a flowability analysis to determine:

- the minimum outlet size required to prevent arching and ratholing;
- the hopper angles and surface finishes needed to ensure flow of material along the walls; and
- the stress conditions that may lead to compaction or caking over time.

These findings form the functional design of silos, feeders, and discharge chutes, ensuring that materials move as predicted under all expected operating conditions. The result is improved live capacity, smoother throughput, and fewer unplanned cleanouts.

In practice, plants and terminals that have implemented Jenike's recommend-

ations report significant improvements — sometimes doubling discharge rates or eliminating chronic pluggages entirely. Beyond productivity, consistent flow also enhances safety by removing the need for manual rod-poking or entry into confined spaces.

Flow problems: quantifying their impact

Unreliable flow has tangible financial consequences. Every hour a ship waits at berth, a conveyor sits idle, or a silo requires manual clearing adds to operating costs. In fertilizer plants, even minor flow irregularities can cause blending inconsistencies that result in off-spec batches and rework.

Studies across multiple bulk industries show that flow-related downtime can consume 10–25% of total operating hours. In fertilizer handling, where margins are tight and throughput is critical, that percentage directly translates to lost profit.

Consider a port terminal unloading 25,000 tonnes per week. If flow interruptions reduce discharge efficiency by 15%, the terminal could lose nearly 4,000 tonnes of capacity weekly — equivalent to an entire ship's cargo every month. Correcting the root cause through measured flow problems and redesigning typically repays its costs within a single season.

How Jenike & Johanson Helps

Jenike's work begins with understanding the material itself. Using specialized test equipment, engineers quantify how a fertilizer's flow properties change with temperature, humidity, and storage time, whenever applicable. The data are then applied to design or evaluate each component of the handling system.

Key steps include:

- **Material characterization:** determining cohesive strength, wall friction, compressibility, and bulk density, among other characteristics.
- **Flow pattern prediction:** assessing whether a bin or hopper will produce mass flow or funnel flow and ensuring the correct pattern for the application.
- **Equipment design and optimization:** using flow data to define hopper geometry, feeder configuration, and wall materials, as examples.
- **Retrofit recommendations:** identifying simple modifications — such as inserts, new liners, or geometric changes — that can restore flow without major reconstruction, when feasible.
- **Simulation and validation:** applying analytical tools, including DEM modelling where appropriate, to confirm that proposed designs will perform as intended before fabrication.

This comprehensive approach shifts problem-solving from reactive to proactive. Rather than fighting symptoms like plugging and dust emissions, operators can design systems that inherently prevent them.

Handling for a sustainable future

As the fertilizer industry adapts to stricter environmental and efficiency standards, flow reliability will play an even greater role in sustainability. Every pluggage cleared manually, every plume of dust from uncontrolled discharge, represents wasted energy and increased emissions.

Optimized handling systems consume less power, generate less dust, and extend equipment life — all while protecting workers and the surrounding environment. Reliable flow also supports circular-economy initiatives by reducing product loss and maintaining consistent quality from plant to port.

In the years ahead, as fertilizer demand grows alongside global food security concerns, terminals and producers that prioritize engineered flow solutions will be best positioned to meet both economic and environmental expectations.

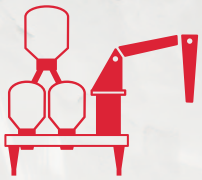
Conclusion

Every stage of fertilizer handling — from unloading ships to filling silos — depends on predictable, controlled material flow. Equipment alone cannot guarantee that performance; it must be designed and operated based on a clear understanding of the fertilizer's flow and physical behaviour, under representative process conditions.

By combining laboratory testing, engineering analysis, and decades of design experience, Jenike & Johanson helps clients eliminate chronic flow problems, reduce downtime, and improve overall system reliability. The result is safer, cleaner, and more efficient fertilizer handling — ensuring that the products essential for feeding the world reach their destinations smoothly and sustainably.

The answer to your bulk handling questions

Ship unloaders



Road mobile ship unloaders

Storage & reclaim

Convey units

Truck loading

Ship loaders

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BULK HANDLING

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Maximizing efficiency and cost-effectiveness when handling and storing cement and clinker

Louise Dodds-Ely

Modular efficiency redefines cement storage: WAM Trading Romania delivers smarter, safer, and more flexible solution

In the ever-evolving world of bulk materials handling, flexibility and efficiency are now key to competitiveness. Cement terminals, ports, and distribution facilities face constant pressure to reduce operational costs, maximize uptime, and ensure safety in demanding industrial environments.

Addressing these priorities head-on, WAM Trading Romania has launched in its market a new modular cement storage system that sets new benchmarks for capacity, flexibility, and reliability.

A new generation of cement storage

At the heart of this innovation lies a battery of four silos, each providing 125m³ of storage capacity, for a total of 500m³ per battery. Considering an average bulk density of 1.4 tonnes per cubic metre, the system delivers a total storage capacity of 700 tonnes — an impressive 40% increase compared to conventional 500 tonnes single-silo configurations.

This gain is achieved while occupying less ground space, reducing the need for concrete foundations, and cutting overall construction costs.

Beyond increased capacity, the modular concept introduced by WAM Trading Romania delivers operational flexibility that a single large silo cannot match. The four silos are arranged into two independent discharge lines, each fitted with a trough screw conveyor capable of extracting material from two silos, at a rate of 80m³/h (112 tonnes per hour) per line. This design ensures continuous operation, even when one line is undergoing maintenance — a significant advantage in sectors where downtime means immediate loss of productivity.

Doubling capacity through smart design

A standout feature of the system is its rotating screw option. Each screw can be turned 180°, effectively doubling the discharge capacity to 160m³/h, outperforming conventional solutions.

This flexibility allows operators to respond dynamically to variable loading demands, optimizing performance during peak operations.

The modular arrangement also enables simultaneous storage of two different types

of cement — for example, white cement in two silos (250m³ per line) and grey cement in the remaining two (250m³ per line). In contrast, a traditional single-silo system can only store one product at a time after being completely emptied.

This feature offers major logistical advantages for multi-product terminals, allowing quick product changeovers and improved inventory management.

Continuous operation, simplified maintenance

Maintenance efficiency is another area where modular battery silos stand out. Thanks to the dual-line configuration, one line can remain fully operational while the other undergoes maintenance, ensuring uninterrupted workflow and product flow continuity.

Additionally, the low inclination of the trough screws offers tangible operational benefits. Their geometry allows easy access and straightforward cleaning in the event of material blockages caused by variable grain size or moisture content.

The use of trough screws instead of steeply inclined tubular conveyors represents a huge advantage in reliability and maintenance, reducing intervention times and ensuring smoother performance.

Designed for safety and structural integrity

Safety and durability are cornerstones of WAMGROUP's engineering philosophy. The new modular battery system comes with certified seismic design documentation for zone 2 (PGA 0.25), ensuring robust structural integrity in earthquake-prone areas.

The compact footprint of the installation reduces the number of concrete foundations required, resulting in lower civil engineering costs and a quicker, more efficient construction process.

The lighter structural design also simplifies project execution and shortens commissioning time, without compromising strength or longevity.

Every component, 100% WAMGROUP

Every silo within the system is fully equipped with premium WAMGROUP

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Performance delivered

Groundbreaking Solutions

KOCH Solutions stands at the vanguard of material handling, driving progress with over three centuries of combined expertise and a global portfolio boasting 10,000 projects. At KOCH Solutions, we are redefining material handling excellence with our advanced stockyard systems. Meticulously engineered to cater to the dynamic demands of high-capacity operations, our solutions stand out for their modular innovation and seamless integration into existing workflows. Crafted from a blend of tried-and-tested components, each system we devise is a testament to our commitment to tailor-made efficiency. We don't just provide equipment; we deliver comprehensive, turnkey solutions that resonate with your unique specifications, ensuring operational effectiveness paired with economical investment and operating costs. Our ethos is to forge a path of progress in material handling that aligns with your vision of growth and efficiency.

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components, ensuring a consistent level of quality, safety, and performance throughout. Among the key elements included are:

- **SILOTOP® Zero and SILOTOP® PolyTUBE** silo venting filters, for maximum filtration performance with minimum energy consumption.
- **Pressure Relief Valves VCP/VHS**, ensuring safe pressure control.
- **Level Indicators ILT** for precise material monitoring.
- **DUPLOCON®** and **FLOWAIDS** for efficient cement discharge from silos in concrete and dry premixed material processing plants.
- **Slide Gate Valves VIB** for controlled flow discharge.
- **Zero-Emission Loading Bellows,** remotely actuated for clean and efficient truck and barge loading.
- **Silo Safety System KCS** for comprehensive operational protection.

Every component is manufactured by WAMGROUP, reaffirming the company's commitment to in-house quality, advanced design, and system compatibility.

A cost-efficient and fast-track solution

The modular battery silo concept stands out not only for its engineering but also for its economic advantages. The reduced footprint and optimized layout lead to lower construction and installation costs, making it the most cost-effective solution in its class.

Equally important, the system's modularity and standardization allow for short lead times, enabling faster project delivery — a key advantage for customers seeking to expand or modernize facilities within tight schedules.

Proven results in the field

This solution is already proving its value in real-world installations in Romania and Bulgaria, including at the ports of Burgas and Varna and in Frăteşti, where it has demonstrated outstanding operational efficiency, safety, and reliability under demanding conditions.

These achievements highlight WAM Trading Romania's pioneering role in bringing this next-generation modular storage concept to the local market and providing comprehensive technical assistance — from project design through installation and start-up.

Their deep understanding of customer needs and on-site realities ensures that each project is executed with precision and attention to detail.

Conclusion

With its four-silo modular storage system, WAM Trading Romania has delivered a technological leap forward for the cement storage — combining greater capacity, dual-line flexibility, enhanced safety, and ease of maintenance, all while reducing installation costs and footprint.

In an industry where every tonne and every hour counts, WAMGROUP once again demonstrates the value of its philosophy in the building & construction industry: Smart Engineering for a Cleaner, More Efficient Future.

Robust, reliable, and remarkably adaptable, this new generation of modular storage systems proves why WAMGROUP — and its subsidiaries such as WAM Trading Romania — continue to set the benchmark for innovation in bulk material handling worldwide.


MOVING
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Provider of Technical- & Bulk Handling Solutions

AUMUND launches the revolutionary electrified Linear Calcination Conveyor (eLCC)

Pioneering sustainable clay calcination for next-generation cement production

Innovative technology addresses growing demand for LC3 Cement while achieving carbon-neutral operations

AUMUND Fördertechnik GmbH, a global leader in conveying technology with over 27,000 installations worldwide, has announced the official market launch of its groundbreaking electrified Linear Calcination Conveyor (eLCC). This innovative, patented solution directly supports the cement industry's transition to sustainable production methods, specifically enabling efficient clay calcination for Limestone Calcined Clay Cement (LC3).

The cement industry faces unprecedented pressure to decarbonize, accounting for approximately 8% of global CO_2 emissions. LC3 (limestone calcined clay cement) presents a transformative opportunity to reduce emissions and unlock economic benefits within existing industry infrastructure. LC3 is a blend of clinker, calcined clay, limestone, and gypsum, which reduces carbon emissions in the cement production process by up to 40% compared to ordinary Portland cement.

LC3 technology represents a paradigm shift in cement composition, utilizing approximately 50% clinker (compared to 95% in ordinary Portland cement), 30% calcined clay, 15% limestone, and 5% gypsum. The synergy between calcined clay and limestone creates complex pozzolanic reactions, with calcined clay providing additional alumina that reacts with limestone to form carboaluminate phases, contributing significantly to strength and durability while maintaining comparable or superior performance characteristics to conventional cement.

AUMUND's eLCC Technology

Engineering excellence meets environmental responsibility

Building on more than two decades of expertise in conveying hot materials — including proven solutions like the KZB-S (up to 1,000°C), BZB-H-I (up to 850°C), and FPB-K (up to 850°C) — AUMUND has developed the eLCC specifically for efficient clay calcination. The development project, initiated nearly four years ago in collaboration with HOLCIM, culminated in the construction of a pilot demonstration unit at AUMUND's headquarters in Rheinberg, Germany, where initial calcination tests produced encouraging results.

The technology addresses the critical challenge of clay calcination, which requires precise temperature control at 750–800°C — significantly lower than traditional clinker production temperatures. This temperature reduction, combined with the eLCC's energy-efficient design, contributes substantially to the overall carbon footprint reduction achieved by LC3 cement.

Advanced technical features

The eLCC incorporates the following advanced design elements and features:

- **Triple heat barrier system:** advanced engineering limits chain and roller temperatures while maintaining optimal calcination conditions
- **Heat deflector technology:** strategically positioned plates at discharge and return points minimize heat losses and create distinct calcination zones
- **Inert gas purging capability:** controls colour variations from iron oxidation, ensuring consistent product quality
- **Complete enclosure and insulation:** maximizes thermal efficiency and minimizes environmental heat loss

Superior energy efficiency and proven durability

The eLCC's specific energy requirement is significantly lower compared to alternative solutions due to its completely enclosed and insulated design. The compact heating chamber volume reduces heat losses substantially and enables rapid system startup, providing unprecedented operational flexibility for plant operators. This design philosophy aligns with the cement industry's need for responsive, efficient production systems.

Based on AUMUND's robust pan conveyor technology, the eLCC benefits from decades of field-proven reliability. The modular design architecture allows production capacities to be expanded seamlessly by adding additional modules,

eLCC demonstration pilot unit at AUMUND Fördertechnik Headquarter in Rheinberg, Germany.

eLCC demonstration pilot unit at AUMUND Fördertechnik Headquarter in Rheinberg, Germany.

providing long-term scalability as market demand for LC3 cement grows.

Carbon-Neutral Operation Capability

While the eLCC can accommodate various heating systems including ceramic gas burners, its electric heating elements can be powered entirely by renewable energy sources such as wind or solar power. This capability enables completely carbon-neutral calcination processes with zero direct CO_2 emissions, thus representing a fully sustainable cement production technology approach.

Global market presence

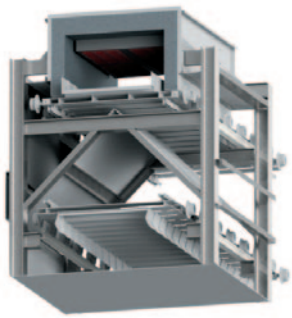
With the support of HOLCIM, a global cement industry leader, in the development and testing process, the eLCC technology is now ready to be globally marketed. AUMUND's established presence in the cement sector, supported by decades of successful global partnerships and technological expertise, positions the company to drive the widespread adoption of the eLCC as a sustainable calcination technology.

The AUMUND Group, with its manufacturing companies AUMUND Fördertechnik GmbH, ESI Eurosilo B.V, SCHADE Lagertechnik GmbH, SAMSON Materials Handling Ltd and Tilemann GmbH, is a leading international specialist in conveying and storage technology. The eLCC represents the latest advancement in AUMUND's comprehensive portfolio of solutions designed for the evolving needs of sustainable industrial operations.

AUMUND continues to invest in research and development to enhance the eLCC's capabilities and explore additional applications for sustainable bulk material handling technologies across various industries.

About the AUMUND Group

Operating in over 150 countries worldwide, the AUMUND Group is a recognized expert in bulk material handling with more than 27,000 references. Its technically advanced, innovative solutions can be seamlessly integrated into virtually any customer or site-specific setup. AUMUND systems for the safe transport of hot, abrasive materials, optimized cooling processes, advanced storage and blending bed technology, as well as mobile loading and unloading systems, have made the Group a key player in demanding industries. At the same time, AUMUND companies are reliable partners for plant manufacturers and operators — whether for new builds, conversions, or modernization projects. Multiple production sites with engineering and R&D capabilities, strategically located warehouses, in-house spare parts production, international service companies, service centres, and numerous sales locations ensure maximum plant availability for customers worldwide – while supporting resource conservation.



Design of the AUMUND eLCC (electrified Linear Calcination Conveyor).

Since 2023 the Aumund Foundation has been the new proprietor of the AUMUND Group with the aim of a long-term and sustainable company development.

Alongside reliable plant availability, customers can also count on the sustainability of solutions from AUMUND. Each Group company and each service provider offers ecological solutions, which are environmentally sound, and follow the principle of the circular economy.

Get a strategic advantage in cleaning cargo holds with CLIIN Robotics

For shipowners, service providers and operators, the business of bulk cargo is a relentless balance of minimizing costs and maximizing revenue.

Every hour spent in port represents lost revenue and has a direct impact on the bottom line.

No task embodies this challenge more than the post-voyage cleaning of cargo holds, particularly after carrying demanding commodities like cement and clinker.

By removing potential contaminants and creating a clean, dry environment suitable for the next cargo, the cleaning process is critical.

Traditional and manual cleaning methods are often labour-intensive, hazardous, and time-consuming, making them an unnecessary expense.

Cargo hold cleaning is also crucial for maintaining the integrity and extending the lifetime of internal cargo hold coatings.

The robotic shift in maritime business

The Cargo Hold Robot, produced and developed by the Danish company CLIIN Robotics, transforms cargo hold cleaning by drastically reducing the necessity for people to perform manual cleaning in inherently hazardous work areas. This significantly reduces the risk of accidents, improves the overall working environment, and consequently reduces costs.

The Cargo Hold Robot (CHR) decreases cleaning time by up to 50% compared to traditional multi-step cleaning methods that require a large team of workers. This results in faster vessel turnaround times, maximizing laden days, and improving profitability for shipping companies.

The robot's ability to clean even while the ship is sailing (with hatches closed) further boosts operational efficiency.

Cleaning cement faster, safer, and cheaper

Continuous development in collaboration with customers is a cornerstone of CLIIN Robotics' strategy.

The challenge of cleaning hardened cement and clinker required CLIIN Robotics to develop a specialized dry brush tool. This tool is easily attached to the robot via the switch-system on top of the robot.

The critical issue with cement residue is that using water or other liquid-based substances for cleaning will result in solid rock deposits instead of a clean hold.

By attaching a specially designed dry

ABOUT THE CARGO HOLD ROBOT

Cleaning capacity:	Covers 500–800m²/h
Weight:	89kg
Dimensions:	L747mm x W562mm x H310mm.
Vertical lifting capacity:	Capable of lifting up to 250 kg vertically.
Impressive torque:	Boasts a peak torque of +1,800Nm, surpassing that of modern electric cars.
Durable construction:	Crafted in Denmark from advanced, non-corrosive materials including duplex stainless steel, titanium, carbon glass, reinforced polymers, ensuring long-lasting performance and resistance to chemicals.
Impact testing:	Achieved IK10 rating. Tested with a 1,000g mass dropped from 400mm onto light-transmitting parts, and from 700mm onto connectors.
Extreme temperatures:	The robot was tested for 672 hours at 80°C and for 24 hours at –25°C.

Cargo Hold Robot cleaning coal.

Dry cleaning cement in cargo holds.

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That’s more than a sound you hear. It’s expectations being shaken. One small change that sets the stage for so much more. When the new Hägglunds Thunder resonates with your needs, the result is electrifying. Learn what a difference a single difference can make at **www.hagglunds.com**.

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HÄGGLUNDS

brush tool for cement to the robot, it efficiently removes the hardened cement and clinker residue from the cargo hold surfaces.

The CLIIN dry Cement Cleaning Tool is more than just a piece of equipment; it's a solution to the most critical operational challenges in the bulk shipping sector.

The innovative brush tool with four brushes and a pressure reduction valve is engineered for effective dry cleaning. This system also minimizes dust, ensuring a safer and dust-reduced environment, thus safeguarding the well-being of workers.

The robot is controlled easily by a remote joystick, allowing safe operation from the ground, minimizing exposure to harmful cement dust. Additionally, the cleaning operation reduces the need for cherry pickers and minimizes the number of personnel involved.

CLIIN Robotics is currently the only company worldwide to offer dry cleaning of cement by a brush tool on a robot.

Maximizing earning potential and protecting assets

The dry-cleaning process dramatically reduces the time a vessel needs to spend in port for cleaning, enabling a quick turnaround. This not only saves on labour costs but, more importantly, allows the ship to return to service faster, directly increasing its earning potential.

The cost efficiency of this technology extends beyond just labour. Traditional methods require expensive and corrosive chemicals, which degrade the protective paint coatings in cargo holds. The CLIIN dry-brush, chemical-free process actively protects these coatings, extending their lifespan and reducing long-term maintenance costs. By simplifying a complex task and requiring a smaller crew, the robot directly lowers operational expenses and reduces the impact on the environment.

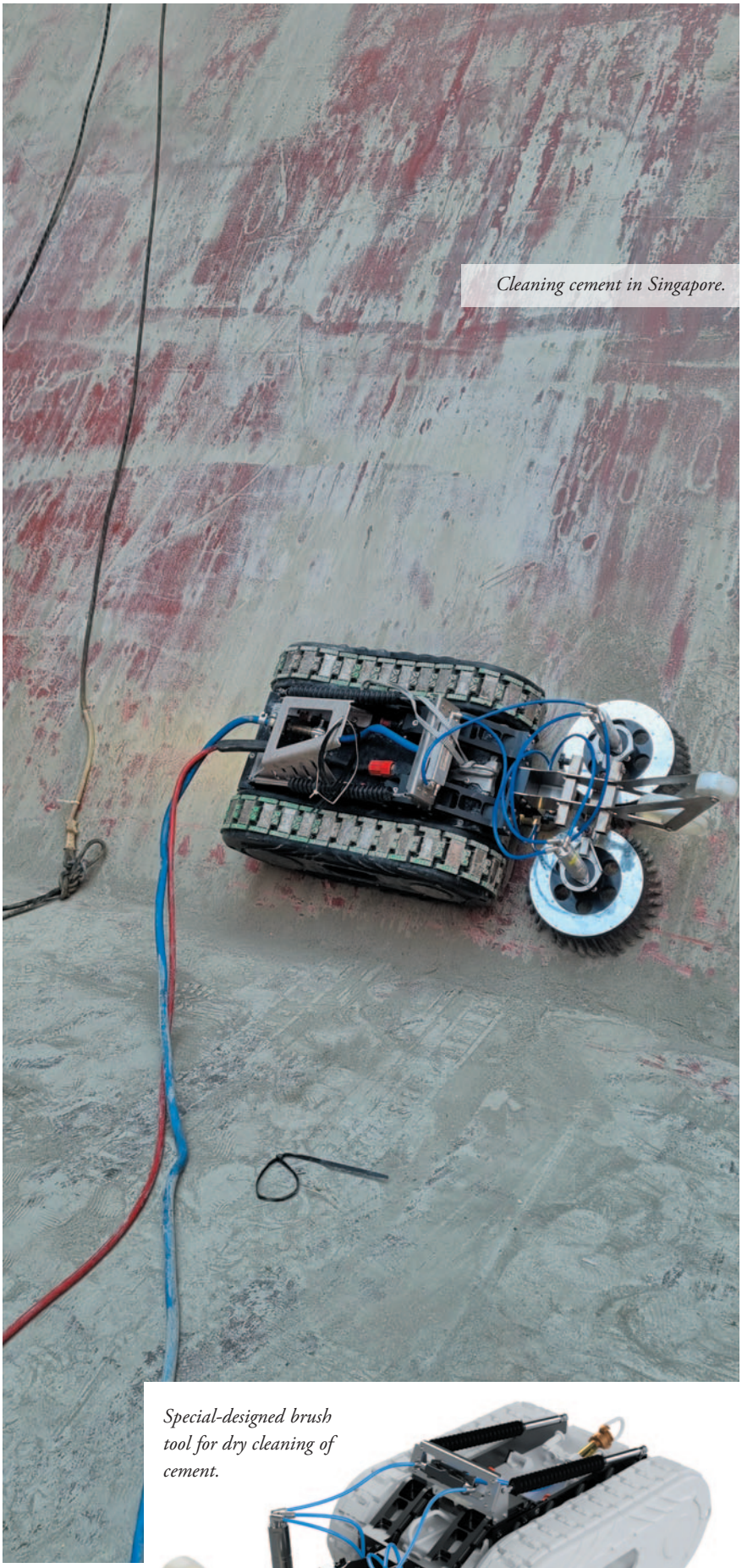
Dry cleaning in Singapore

Cement and clinker are particularly difficult to handle. When moisture infiltrates a cargo hold, the fine dust transforms into concrete-like deposits that adhere to every surface. If not removed promptly, these residues can cause permanent structural damage.

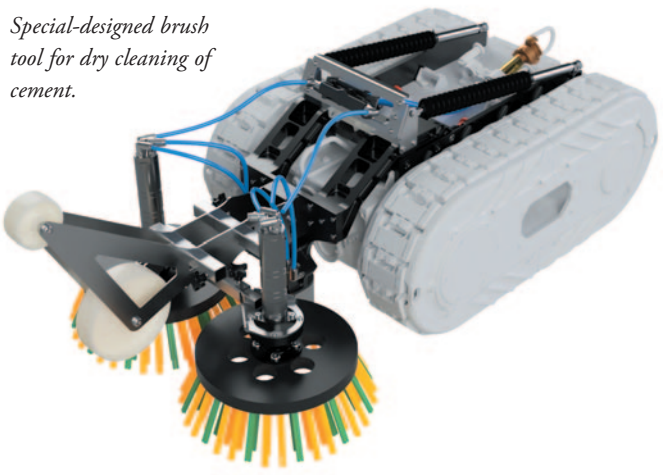
The recent contract award in the Singapore harbour is a powerful testament to the robot's effectiveness.

The CHR is easy to operate by the vessel's crew, requiring minimal training. This empowers crews to manage cleaning operations in-house, reducing reliance on external cleaning contractors and further driving down operational costs.

Singapore is one of the world's busiest ports, and a



Cleaning cement in Singapore.



Special-designed brush tool for dry cleaning of cement.

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Tracker™ HD / Lower

Roller Tracker

Tracker™ Reversing

Martin's belt alignment products provide immediate, continuous precision adjustment — keeping conveyor belts aligned under the demanding conditions of heavy loads and high speeds. Proper tracking prevents edge damage, extends belt life, reduces equipment wear, and keeps material in the flow stream — eliminating the fugitive dust and spillage that lead to costly cleanup, production delays, and worker safety risks.

martin® engineering

Cargo Hold Robot wet cleaning with high-pressure water.

successful dry cleaning of a cement cargo hold there demonstrates the robot's ability to perform in high-stakes environments and to deliver on its promise of efficiency, safety and reliability.

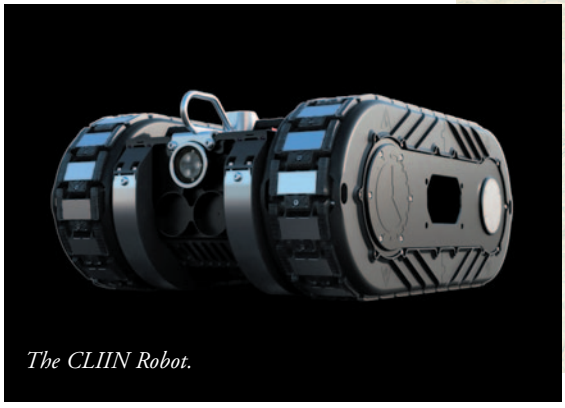
The maritime industry is facing increasing demands for safety and environmental protocols, and CLIIN's technology addresses both.

Ultimately, the choice to adopt robotics like CLIIN's comes down to a clear value proposition.

By automating cargo hull cleaning, maritime shipowners, service providers and operators are seeing significant reductions in downtime, labour costs, and exposure to hazardous chemicals when cleaning.

The consistent, high-quality cleaning directly translates to better adherence to environmental regulations and improved vessel performance. For an industry facing razor-thin margins, these robot solutions a competitive necessity for maintaining profitability and compliance.

Set up and training in Singapore.



The CLIIN Robot.













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MADE IN USA

ASGCO "Complete Conveyor Solutions": building reliability in cement and clinker handling

Moving cement and clinker efficiently has always been a challenge. The materials are dusty, abrasive, and unforgiving to equipment that isn't built for the job. That's where ASGCO "Complete Conveyor Solutions" comes in. ASGCO is a US-based manufacturer focused on improving the performance, safety, and cleanliness of conveyor systems across the bulk handling industries. Founded in 1971 and headquartered in Nazareth, Pennsylvania, ASGCO has built a strong reputation for engineering conveyor components that work in the harshest environments.

Equipment designed for cement and clinker

Cement plants rely on ASGCO's technology at nearly every stage of production, from raw feed handling and pre-heater transfers to clinker take-away and finish-mill discharge. The company manufactures a comprehensive range of components, including belt cleaners, impact beds, tracking idlers, skirting systems, wear liners, pulley lagging, take-up frames, and guarding systems.

Belt cleaning

One of ASGCO's strongest areas of expertise lies in its line of primary and secondary belt cleaners, purpose-built to handle the fine, powdery carryback common in cement and clinker operations. Carryback material that sticks to the belt after discharge can quickly accumulate on pulleys, rollers, and structures, leading to mistracking, belt slippage, and excessive maintenance. ASGCO's cleaners are engineered to prevent these problems before they start.

Belt tracking and alignment

Cement producers have long struggled with belt mistracking due to material buildup or off-centre loading. ASGCO's Tru-Trainer® tracking idlers automatically correct the belt path without ever touching the edges, preventing damage and extending belt life. Many plants have reported near-zero tracking issues after installation.

Dust control, sealing, and load-zone support

Cement dust is notoriously hard to contain. ASGCO's Clamp-Mount® and skirting systems are designed for easy installation and tight sealing, keeping dust

and fines where they belong, on the belt. The result is cleaner work areas, less maintenance, and improved air quality. Combined with impact beds and load-zone support systems, they protect belts from heavy impact and eliminate spillage that can slow operations or create safety hazards.

Safe Access and Maintenance

Safety is at the core of ASGCO's design philosophy. The company's Safe-Guard® inspection doors and guarding systems allow maintenance crews to visually inspect, clean, or adjust equipment quickly and safely. This helps cement producers comply with safety regulations while cutting downtime during inspections or maintenance.

Clients and Recent Work

ASGCO's equipment is used by major integrated and independent cement producers throughout North America and beyond. While most client names remain confidential, the company's case studies tell the story: plants suffering from chronic belt misalignment, spillage, or material buildup have achieved measurable improvements in uptime and housekeeping after ASGCO retrofits.

One recent success involved a clinker transfer belt where misaligned chutes were causing excessive spillage, wear, and downtime. ASGCO engineers redesigned the chute, installed new skirting and load zone support systems, and restored full load-zone integrity. The plant reported a dramatic drop in clean-up labour and belt damage.

Staying Competitive

To remain ahead of the curve, ASGCO continues to invest in both product development and field engineering. Every major component is manufactured in-house, ensuring control over quality and material performance. The company's proprietary urethane formulations used in belt cleaners and skirt seals are designed to withstand the abrasive dust that quickly wears out standard components.

Just this year, ASGCO introduced the GripTrac™ Rubber Tru-Trainer®, an evolution of its proven tracking-idler line. The new model incorporates a redesigned rubber tread to improve grip on dusty belts and provide faster, smoother correction, a valuable feature in cement and aggregate operations.

Equally important is ASGCO's service model. Field technicians and engineers routinely visit customer sites to survey conveyors, troubleshoot issues, and train maintenance teams. This hands-on approach means solutions are tailored to each plant's unique material flow and equipment layout.

Recent Projects and Innovations

Several recent projects have focused on reducing dust and spillage in high-impact zones. One cement plant in the Midwest installed ASGCO's skirting and impact beds on multiple transfer points. Within weeks, the facility reported a 90% reduction in fugitive dust and virtually eliminated the need for daily clean-up around those conveyors.

In another case, a cement producer implemented ASGCO's complete load-zone system from impact beds to skirting and belt cleaners to address carryback and spillage on clinker belts exposed to tropical humidity. The upgrade improved system reliability while achieving smoother, self-correcting belt tracking across the entire system.

Driving Efficiency And Reliability In Cement Handling with ASGCO

In an industry where reliability and cleanliness directly affect production efficiency, ASGCO continues to stand out for its commitment to innovation and customer partnership. Every solution, whether a simple skirting upgrade or a complete conveyor overhaul, is designed with the end user in mind: safer maintenance, cleaner operations, and longer-lasting performance. As cement producers push for higher output and stricter environmental compliance, ASGCO's focus on engineered simplicity ensures that its conveyor systems remain a dependable backbone of modern cement and clinker handling.

Unleashing the potential of multipurpose ports with mobile ship-unloaders

Flexible dry bulk handling arrangements on the quayside are proving to be invaluable solutions for multipurpose ports; Siwertell ship-unloading systems are offering significant operational advantages to operators that need agile assets that perform on every level

Although many follow trends, global trade in all major and minor dry bulk handing markets fluctuates significantly, and port terminals have to be responsive enough to sustain these vicissitudes. They also have to meet the pressure of increasingly strict environmental regulations if they are to secure or maintain operating licences, and work with the limitations of their geopolitics, organization and infrastructure.

Asset mobility and flexible dry bulk handling arrangements on the quayside are proving to be invaluable, enabling operators to respond, and optimize the profitability of multipurpose quays, where fixed dry bulk handling machinery, such as large, static rail-mounted ship unloaders, are not suitable or permitted.

How can operators best capitalize on a scenario where jetty utilization rates must be maximized, the highest levels of through-ship efficiency need to be achieved, but the quayside must be free when not in use?

Flexibility and performance

An excellent solution is mobile ship-unloading technology. Siwertell systems are forerunners in this sector, not only capable of handling multiple types of dry bulk material, but they can be offered with a range of capacities and mobilities, deliver unparalleled flexibility, operational efficiency and environmental protection.

"Multipurpose ports and harbours are becoming a cornerstone of modern logistics, and offer numerous benefits when meeting the diverse needs of a global dynamic port-scape," says Jan Karlsson, Sales Director, Bruks Siwertell. "Stakeholders in this arena have to think on their feet and look to state-of-the-art mobile dry bulk handling solutions to support them."

Bruks Siwertell offers numerous systems optimized for mobile dry bulk handling. These can range from port-mobile and fully road-mobile models to larger, higher rated capacity machines that have rubber-tyre gantries.

Port-mobile and road-mobile ship-unloaders are based on the proven designs of larger-scale screw-conveyor systems, but are available relatively quickly as they comprise standardized components, which offers substantial costs savings and reduction in lead times.

"In-port mobility is significantly advantageous to multipurpose terminals, and offers some good cost arguments when handling one-off consignments at non-specialist quays, or small-scale operations at dedicated import quays," Karlsson continues.

Multiple mobile assets

"Mobile unloaders should not just be considered suitable for smaller-scale, niche operations, however. With multiple port-mobile units in operation working alongside each other, directly unloading into trucks, dry bulk material can be moved very quickly to shore, dramatically reducing the time a ship stays in port and freeing up capacity for other activities on the berth," explains Karlsson.

When finished, using a self-propelled rubber-tyre gantry and an advanced steering system, the port-mobile unloader can be moved away from the quayside and

even stowed when not in use. To secure the gantry in all directions when parked, the end pairs of axles, both on the sea-facing and land-facing sides, are turned by 90°.

The port-mobile unloader has a low weight design and does not require rails or any other additional infrastructure or preparatory reinforcement to the quay. It is available in two sizes; a 400tph (tonnes per hour) and a 600tph unit, both of which are capable of servicing vessels of up to 70,000dwt.

As standard, they feature a double-truck loading system, with an optional third system. As they are not interlinked, one, two or all three loading positions can be used independently and simultaneously, delivering the fastest truck loading operation possible; a large-volume intermediate surge hopper also smooths any truck changeovers.

Transforming quays to terminals

"When fully road-mobile ship-unloading systems are required, the agility, capability and overall performance of our road-mobile ship unloading range, is impossible to beat," says Karlsson. "They can literally transform a quay with minimal infra-structure into a terminal."

Road-mobile units have a folding structure, which is mounted on a semi-trailer for easy transportation between ports. It only takes 30 to 45 minutes to complete the set-up procedure, with packing away being equally rapid. The road-mobile ship unloader can be deployed by a single operative, keeping staffing costs low.

Siwertell road-mobile unloaders are available in three different sizes: the Siwertell 5 000 S, 10 000 S and 15 000 S; the largest offering an unloading capacity of up to 500tph for discharging ships up to 15,000dwt. In the last few years, Bruks Siwertell introduced ground-breaking changes to its road-mobile range with the introduction of next-generation models. Over a hundred road-mobile unloaders serve ports all over the world.

When operators need higher capacity ship unloading solutions to serve ports that are receiving vessels up to around 80,000 dwt, and are looking for the economies of scale that larger Siwertell ship-unloading models can deliver, these can also be designed to be mounted onto mobile gantries. The most suitable models for this configuration are the Siwertell F-type and Siwertell M-type ship unloaders.

Step-changes in efficiency

References include those serving the US cement handling industry. For example, in the US Midwest, one operator was looking to secure higher capacities and sustainable cement import growth, and opted for a port-mobile Siwertell 490 F-type ship unloader. It was delivered in 2021 and offers high through-ship efficiencies and a rated cement handling capacity of 800tph, discharging vessels up to 55,000dwt.

While another operator in Tampa, Florida, will make the transition from bagged to bulk cement, using a rubber-tyred gantry-mounted Siwertell ST 640-M ship-unloader. It will handle cement at around 1,500tph, discharging vessels of up to 80,000 dwt.

"Combine all the road and port mobility configuration options with the outstanding performance of Siwertell ship-unloading technology, and you can see why operators are able to turn the challenge of a quayside that has to remain flexible into an opportunity for growth and market agility.

"If you consider this in connection with a Siwertell ship unloader's low weight, its ability to minimize dust, and eliminate spillage, operate dynamically within a hold, and offer market-leading through-ship efficiencies of 70% or more, the clarity of choosing Siwertell technology becomes even more evident; it is a strategic investment in the future of dry bulk handling," Karlsson concludes.

Haver & Boecker Niagara's cement industry innovations

As the cement industry continues to face challenges in processing, storage and transportation, Haver & Boecker Niagara stands out as a trusted partner offering mineral processing solutions tailored to meet the sector's evolving demands. With more than a century of experience and a customer-first philosophy, the company delivers cutting-edge equipment and services that improve productivity and profits.

Haver & Boecker Niagara manufactures a full suite of mineral processing solutions designed to handle the rigours of cement production. From vibrating screens, screen media and wear liners to diagnostics and plant simulation, the company's portfolio is engineered to optimize every stage of the process.

Vibrating screens

Haver & Boecker Niagara's vibrating screens are specifically engineered for the cement industry's demanding environment. A few of the company's signature machines include the F-Class vibrating screen, which features a double eccentric shaft design that minimizes vibration transfer to the structure and ensures smooth operation even under heavy loads. For high-capacity screening, the N-Class excels with its ability to handle large tonnages and coarse materials without sacrificing precision.

Both designs leverage gravity to improve efficiency, reducing energy consumption while maintaining high screening accuracy. This approach not only lowers operating costs but also enhances overall productivity.

The machines are available in single-,

double- and triple-deck configuration. Each vibrating screen is built with robust components and customizable options to meet unique plant requirements, minimizing maintenance needs and extending equipment life.

Screen media and wear liners

The company provides a wide range of screen media solutions, including Ty-Max, Ty-Deck, Ty-Dura, Ty-Plate and Ty-Wire, available in modular and hooked formats. These options maximize open area, improve material flow and resist blinding and pegging, ensuring consistent performance even in harsh conditions.

Cement processing is a notoriously harsh environment, which is why Haver & Boecker Niagara provides custom Rhino Hyde liners engineered for superior abrasion resistance. These liners are available in the company's signature polyurethane as well as ceramic chip embedded.

Additionally, the liners can be manufactured with steel, fabric and expanded metal backings to protect critical wear areas such as chutes, hoppers and screens, reducing maintenance costs and extending component life.

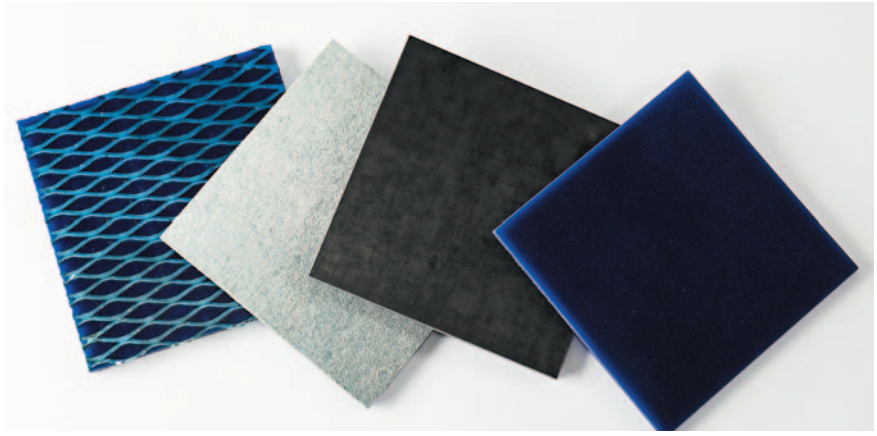
Plant simulation and diagnostics

To support plant design and optimization, Haver & Boecker Niagara offers NIAflow, a powerful simulation software that predicts production outcomes based on tonnage, material characteristics and equipment configuration. This tool helps cement producers identify plant inefficiencies, so plant managers can make informed changes and purchasing decisions to help streamline production.

Additionally, the company offers its signature Pulse Diagnostics Suite, which includes Vibration Analysis, Condition Monitoring and Impact Testing. These tools provide real-time insights into screen performance, enabling proactive maintenance planning and improved operational efficiency. The Pulse Condition Monitoring system is powered by modern algorithms to help deliver accurate forecasts and easy-to-understand data visualizations.

OEM parts, service and refurbishment

Beyond equipment and diagnostics, Haver & Boecker Niagara provides OEM parts and comprehensive service solutions to keep operations running smoothly year-round. The company offers quick access to OEM-certified replacement components and expert maintenance support.



Serving end-to-end solutions

Haver & Boecker Niagara is part of the global Haver & Boecker family, which also includes brands specializing in packing, filling and storage solutions. This synergy allows the company to serve the cement industry at every stage — from raw material processing and classification to packaging and logistics. By combining expertise, Haver & Boecker delivers an integrated approach that helps producers achieve efficiency, quality and sustainability across their entire operation.

About Haver & Boecker Niagara

Haver & Boecker Niagara is a prominent provider in screening, pelletizing and mineral processing plants and systems. The company's mission is to deliver the best of these technologies to customers in the mining, minerals, aggregates, cement, building products, fertilizer and salt and recycling industries. With deep roots and years of experience in these industries, Haver & Boecker Niagara uses its innovative and shared technologies to effectively meet the needs of customers around the world.

Keeping cement – and every ingredient of concrete – moving: how Global vibrators power the material flow chain

Cement may be one of the world's most vital building materials, but it is also one of the most difficult to move. Fine, cohesive, and easily compacted, cement tends to cling to vessel walls, form arches over discharge points, rathole, or harden into dense masses. Sand and aggregates, though coarser, present similar challenges when moisture or compaction alters their flow behaviour. Across the concrete industry, gravity alone isn't enough to keep materials moving — and that's where Global Manufacturing, Inc. comes in.

As an American designer and producer of industrial vibrators, Global supports every stage of the dry-bulk chain that feeds the concrete market, from raw material extraction to final concrete consolidation.

Where the concrete chain starts: quarries, cement plants & fly ash reclaim

Long before cement enters a silo or a mixer, vibration is already essential.

- **Rock quarries** depend on industrial vibrators to keep stone, crushed fines, and mineral powders flowing from hoppers into crushers and grinders. Without vibration, bridging and compaction reduce throughput and increase downtime.
- **Cement manufacturing facilities** rely on vibrators to maintain the steady movement of raw meal, clinker, and gypsum. Consistent feed is crucial for kiln stability and final product quality.
- **Coal-fired power plants** create another important ingredient: fly ash. Because fly ash adheres stubbornly to vessel walls, Global's air blasters deliver concentrated bursts of energy that dislodge buildup and restore full storage capacity—ensuring this supplementary cementitious material remains available for blended cements and concrete mixes.

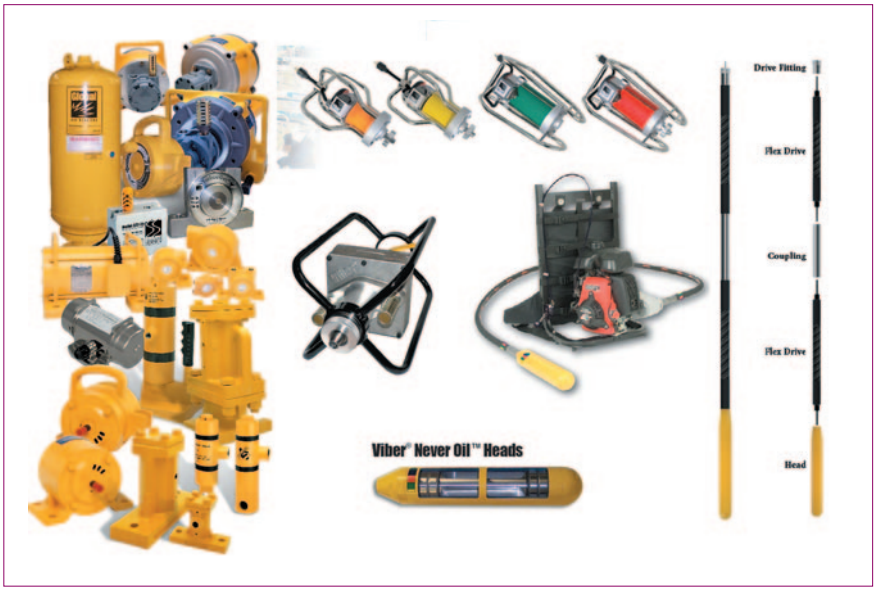
By the time these materials reach terminals or batch plants, vibration has already ensured they moved through multiple steps without costly interruptions.

Bulk ships, marine terminals & the Global journey of cement

Once cement, fly ash, sand, or aggregates are loaded into bulk carriers, compaction becomes unavoidable. Weather, humidity, long voyages, and constant settling transform free-flowing powders into near-solid masses. Efficient, safe unloading is essential at ports.

That's why many of the world's leading marine handling companies and self-unloader ship builders rely on Global's heavy-duty D4.5 hydraulic vibrators. Installed on discharge gates, chutes, and transfer points, these units deliver powerful, continuous energy to break up compacted zones without requiring personnel to enter hazardous spaces. Their rugged design allows them to withstand harsh marine environments while keeping material moving smoothly through unloaders, belts, and hoppers.

The D4.5 has become a trusted tool for freeing stubborn cement and other bulk materials across global shipping operations.



From terminal to silo: supporting domestic cement flow

At domestic terminals and storage sites, cement faces a new set of obstacles: humidity, tall head pressure, and long-term settling within silos. These factors encourage ratholing, arching, and the formation of hard layers.

Global's piston and rotary vibrators address these problems by reducing internal friction and restoring mass flow.

- **Piston vibrators** provide sharp, directional impacts that suit smaller hoppers, blender chutes, and mobile bins.
- **Rotary vibrators** deliver continuous, uniform energy, ideal for large silos and fixed stockyard vessels.

Following principles outlined in Global's How-To Guides, proper mounting ensures

vibration energy enters the hopper wall directly rather than being absorbed by loose hardware. The result: reliable flow and fewer operator interventions.

Batch plants & volumetric mixers: cement on the move

Concrete production — whether at a centralized batch plant or on a jobsite — depends on consistent, uninterrupted flow of cement, sand, and aggregates. Any hesitation in one ingredient can throw off mix ratios and quality.

A leading example is a well-known volumetric concrete truck manufacturer in Pennsylvania. Its units proportion and mix concrete onsite, requiring precise material movement on demand. To keep cement, sand, and fine aggregates flowing inside the truck's compartments, this manufacturer relies on multiple sizes of Global's Yellow Jacket™ piston vibrators.

These compact vibrators deliver high-energy impacts that break up bridging, prevent compaction from road vibration, and ensure a smooth, continuous feed into the auger mixer. Their durability is critical as they operate in rain, heat, freezing temperatures, and off-road environments — conditions where unreliable flow would stop production entirely. For noise-sensitive regions, Global also offers air-cushioned Yellow Jackets.

Sand and aggregates need help too

While cement often gets the most attention, sand and aggregates can be equally problematic. Moisture swings cause sand to clump into cohesive masses. Irregular shapes in coarse aggregates

encourage bridging and hang-ups. Vibrators help maintain predictable discharge, improve batching accuracy, minimize the need for manual intervention, and reduce wear on conveyors and augers downstream.

Global's broad lineup — including linear, rotary, and piston vibrators — gives operators the right tools to manage every material in the concrete blend.

A final step: consolidating fresh concrete

Global's support doesn't end once dry materials become wet concrete. Through its Viber® internal vibrators and external form vibrators, Global helps contractors remove entrapped air and achieve proper consolidation during placement — bringing the material all the way from raw extraction to finished structure.

One partner for the entire concrete material journey

From rock quarries…
to cement manufacturing…
to reclaiming fly ash…
to bulk ships crossing the globe…
to stockyard hoppers and silos…
to the batch plants and mobile mixing trucks…
to the consolidation of fresh concrete…
Global Manufacturing, Inc. supports every stage.

Reliable flow creates reliable production — and Global ensures that the ingredients of concrete get where they need to go, exactly when they're needed.

Nuh Çimento upgrades port operations with electric portal crane LPS 420

Strategically positioned along the Gulf of Izmit, the port serves as a vital maritime gateway for Nuh Çimento's outbound logistics. Its infrastructure is tailored for high-throughput bulk handling, supporting continuous vessel operations and streamlined cargo flows that are essential to the company's export-driven business model.

Electrifying efficiency meets enduring trust. The LPS 420 portal crane has been successfully installed at Nuh Çimento's private port in Hereke, Türkiye, where it is now supporting high-volume bulk handling operations. It is equipped with an electric drive, allowing the port to reduce fuel consumption and local exhaust emissions. Its slewing mechanism is supported by Liebherr's closed hydraulic circuit, which ensures smooth and energy-efficient rotation even under heavy load. The crane's advanced Litronic control system enables precise handling of bulk materials. These features make the LPS 420 particularly well suited for high-throughput terminals handling abrasive materials such as clinker and cement.

The electric-drive Liebherr LPS 420 is in operation at Nuh Çimento's private port in Hereke, Turkiye. The crane marks a major step forward in sustainable bulk handling, replacing a Liebherr LPS 400 after 25 years of service and supporting high-volume exports to over 40 countries.

From legacy to leadership: a generational leap in port performance

The new portal crane replaces a Liebherr LPS 400 that had been in continuous operation since 1999.

The LPS 400 at Nuh Çimento is the world's first Liebherr portal slewing crane to be delivered, helping establish a proven design. More than 130 LPS cranes have been delivered worldwide, establishing it as a trusted tool for port operators with rail-based quay infrastructures.

With increasing maintenance demands and the need for greater efficiency, Nuh Çimento opted for a new LPS 420 to ensure seamless continuity in its port operations. The installation process was carried out under the supervision of Liebherr experts and completed on schedule, with the customer praising the smooth co-ordination and technical expertise involved.

"We have known the LPS series for many years and are very familiar with the material we handle," a Nuh Çimento representative explained. "The LPS 420 was a natural choice for us. Installation was quick and easy, just like a Lego. Our operators adapted to the new crane very quickly because it is practical and easy to use. It feels like a continuation of what we already knew, but with more power and less effort."

The port's physical capacity supports this operational upgrade. It features a 595-metre berth and can accommodate vessels up to 80,000 deadweight tonnes. A 300-metre underground conveyor tunnel and automated loading systems ensure fast and efficient cargo transfer, enabling Nuh Çimento to maintain high throughput while meeting the logistical demands of exports to more than 40 countries across five continents.

The project underscores the importance of reliable port infrastructure in Nuh Çimento's business model, which relies heavily on maritime logistics to serve international markets. Compared to the LPS 400, the new crane offers improved cycle times, reduced maintenance intervals and a quieter, cleaner working environment. With the new crane in place, the company is well positioned to meet growing demand while maintaining high operational standards.

Powering Türkiye's industrial heartland with electric precision

The adoption of the LPS 420 also strengthens Nuh Çimento's resilience in the face of rising energy costs and tightening environmental regulations. By incorporating an electric drive system, the crane supports compliance with international sustainability standards while lowering long-term operating expenses. Its quiet, low-vibration operation further enhances safety and working conditions on site, particularly important in a port environment that operates around the clock.

Liebherr's regional service network ensures rapid response times and expert support, a factor that Nuh Çimento identified as critical to its operations. The company emphasized that crane availability is essential to maintaining its shipping schedule.

"Our cranes must be ready to work when needed,' the customer noted. 'With Liebherr, we have ensured a safe and reliable working environment. This project reflects the strength of our long-standing relationship with Nuh Çimento.The LPS 420 builds on decades of shared experience and delivers a future-ready solution that supports their evolving operational and environmental goals," said Andreas Ritschel, General Manager Sales Mobile Harbour Cranes at Liebherr-Rostock GmbH.

About Liebherr-Rostock GmbH

Liebherr-Rostock GmbH is one of the foremost 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 2024, it employed more than 50,000 staff and achieved combined revenues of over €14 billion. Liebherr was founded by Hans Liebherr in 1949 in the southern German town of Kirchdorf an der Iller. Since then, the employees have been pursuing the goal of achieving continuous technological innovation, and bringing high-quality solutions to its customers. DCi

IMGS Group: redefining resilience in high-moisture material handling

What if resilience began not with steel or concrete, but with sand — the wet, heavy kind that builds cities and holds back floods?

Every year, the world consumes more than 40 billion tonnes of sand, cement, and aggregates, fuelling a market worth over US$560 billion. Yet when moisture enters the mix, precision becomes one of the industry's toughest challenges. In high-humidity environments, materials can clump and mis-weigh by up to 15%, slowing output and inflating costs. For flood-control teams, that means fewer sandbags filled when every minute counts; for construction sites, it means inconsistent quality and wasted tons.

When moisture becomes the enemy

Handling wet sand, cement, and aggregates is a delicate balance between accuracy and speed. Moisture affects density, flow, and bag stability — tiny variables that multiply into massive losses across ports and job sites. Dust control, drainage, and weight calibration all become critical, especially in tropical or coastal regions where rainfall and humidity are constant. Without the right filtered bagging system, efficiency sinks and downtime climbs.

Engineering precision under pressure

That's where IMGS Group brings engineering discipline to mobility. Designed specifically for moisture-heavy cement, sand, and aggregate materials, IMGS's mobile filtered bagging systems maintain precision even in the toughest conditions.

- **Vibrating hammers** de-clump compacted or wet aggregates, keeping each bag evenly filled.
- Dual bagging lines deliver up to 30 bags per minute, doubling productivity when speed matters most.
- Adjustable stitching arms accommodate everything from 15–100kg units to 1–1.5-tonne bulk bags.

Heavy-duty stabilizing jacks ensure accuracy on uneven terrain — a vital feature for mobile and emergency setups.

Each filtered bagging system integrates seamlessly with warehouses, silos, and containerized depots, creating a continuous flow from storage to transport. Whether deployed quayside, inland, or at remote project sites, IMGS ensures every bag of sand, cement, or aggregates is sealed with consistency and confidence.

Mobility meets preparedness

As climate events grow more frequent, mobility in cement and sand bagging is no longer optional — it's lifesaving.

According to the World Bank, over 1.8 billion people face flood depths severe enough to cause damage in a 1-in-100-year event. IMGS supports rapid-response operations through mobile sandbagging units capable of producing thousands of flood-barrier bags per hour. These can be deployed quickly to high-risk regions, while strategically located IMGS warehouses maintain ready-to-use stock for immediate dispatch. In humid, coastal conditions where moisture never fully subsides, IMGS systems keep performance steady — turning damp bulk into dependable resilience.

Global reach, local reliability

From the Gulf's desert ports to Africa's river corridors and coastal cities, IMGS operates where humidity, sand, and aggregates meet urgent demand. Its network of strategic storage facilities keeps materials dry, accessible, and deployment-ready — ensuring that supply chains stay intact during both construction peaks and emergency response. Each operation reflects IMGS's mission to make cement and material logistics more agile, precise, and sustainable across every region it serves.

Building the future of material logistics

As the planet grows more prone to flooding and the pace of development accelerates, precision in handling cement, sand, and aggregates is no longer a technical detail — it's the foundation of resilience. IMGS Group turns mobility into mastery and every bag into reliability, ensuring that progress and protection move hand in hand.

IMGS is building smarter, faster, and stronger filtered bagging system solutions.

Belgian Bulk

Regional Report on Belgium

Jay Venter

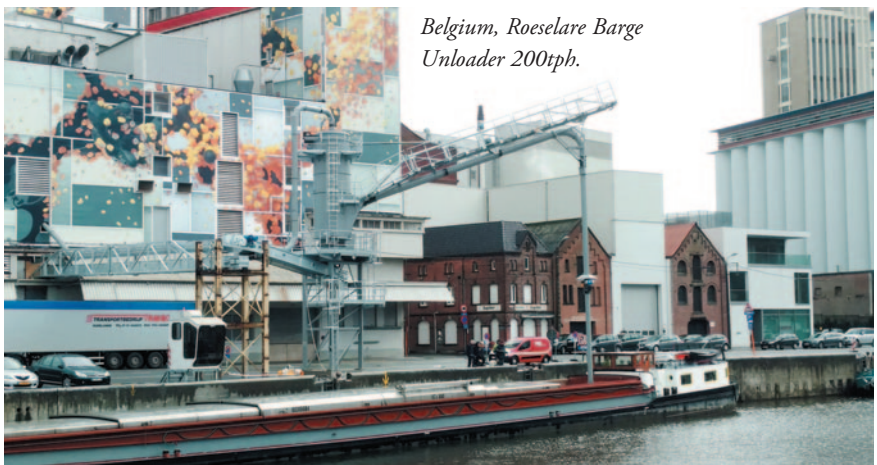
VIGAN: one-stop solution for various port needs

Founded in 1968, VIGAN is a Belgian manufacturer with a global reputation for its advanced pneumatic ship-unloading equipment. Known for the quality and reliability of its products, VIGAN is supported by a team dedicated to precision and innovation.

The company's headquarters are in Nivelles, Belgium, strategically located just 30km south of Brussels and close to the international port of Antwerp. This central European location facilitates worldwide shipping and enhances VIGAN's connectivity with top-quality suppliers across the region.

VIGAN initially focused on pioneering pneumatic unloaders based on a unique turbine concept. Over time, it has enhanced its equipment through new materials and advanced steering systems, which boost both capacity and efficiency. VIGAN's designs are free from outdated or unnecessary accessories, focusing instead on performance, reliability, and minimal maintenance. As a result, VIGAN machines rank among the most efficient in the market, delivering exceptionally low operating costs.

Misurata, Libya, NIV 300tph.



Belgium, Roeselare Barge Unloader 200tph.

At the same time, VIGAN differentiates itself through advanced automation systems. While remaining cautious about unnecessary gadgets, the equipment integrates smart, robust automation that ensures optimized operation, seamless control, and adaptability to the most demanding working conditions.

VIGAN's commitment to continuous improvement and customer satisfaction has led it to diversify its range, making it a one-stop solution for various port needs:

- **Grain pumps:** compact and mobile, these pumps are designed for rapid deployment, with capacities of up to 250tph (tonnes per hour).
- **Pneumatic and mechanical ship-unloaders:** available in fixed and mobile versions, these unloaders reach capacities up to 1,000tph

Handle bulk with efficiency and reliability

Pneumatic and mechanical ship (un)loaders
Up to 2500 tph for loaders and up to 1200 tph for unloaders.

Low noise & no dust emission
Turnkey solutions for cereals, soy flour, fertilizer, pellets and more...

SCAN ME

VIGAN

(tonnes per hour), with mechanical options capable of handling 1,500tph.

- **Loaders:** adaptable for bulk products and various vessel sizes, VIGAN's loaders achieve mechanical loading capacities up to 2,000tph.
- **Terminals:** VIGAN offers turnkey terminal solutions, including ship-unloading/loading, storage, and bagging operations.

All metallic structures are manufactured from alloyed steels provided by a sister company, ensuring that VIGAN's production remains rooted in Belgium. Local manufacturing guarantees rigorous quality control and enables rapid after-sales support, underscoring the company's commitment to excellence.

In recent years, VIGAN has doubled its production capacity, enhancing its facility in response to growing demand. This expansion reflects VIGAN's dedication to long-term customer relationships, with many clients still using machines built over 40 years ago. All operations are conducted on its 12,000-square-metre site, where close collaboration between sales, engineering, manufacturing, and customer service teams ensures efficiency and streamlined communication. Each machine is pre-assembled in Nivelles, reducing on-site assembly times, precision and ensuring timely delivery.

VIGAN exports 99% of its equipment, with emerging markets primarily in rapidly growing regions. The company's expertise in emissions-reducing technology aligns with global environmental priorities, creating new market opportunities.

Like Belgian beer and chocolate, VIGAN's equipment is renowned worldwide, serving as a testament to Belgian quality and craftsmanship. The company has fostered strong partnerships with key players internationally and domestically, including leading partners such as Brabomills, Dossche Mills, Malteries Albert (Heineken Group), and Cargill, which operates facilities in Ghent and Antwerp.

The recent installation of a pneumatic unloader at Maselis in Roeselare further solidifies VIGAN's presence in the domestic market, underscoring its reliability and strong client relationships.

VIGAN has recently installed two new continuous pneumatic unloaders NIV800 in Ghent, each with a capacity of 800tph. These machines mark a significant achievement for VIGAN. Several additional units for other clients worldwide have already been produced to meet growing demand.

Ghent, Belgium, NIV 800tph.

Callao, Peru NIV800tph.

Vertical integration

VIGAN's vertical integration ensures comprehensive control over all stages of production, a distinction from competitors who rely on subcontractors. This approach allows the company to oversee design, engineering, manufacturing, coating, and quality testing, guaranteeing exceptional standards:

- design and engineering of machinery;
- manufacturing and assembly of mechanical components;
- preparation, coating, and protection of structure;
- instrumentation & control systems; and
- electrical design and enclosure fabrication.

By pre-assembling and testing each machine in Nivelles, VIGAN ensures optimal reliability and durability, resulting in equipment that often operates continuously for decades in demanding environments. The company's commitment to operational availability extends to careful vetting of new technologies, which are integrated only after rigorous testing for resilience and ease of use.

A dedicated department for electrical and electronic components exemplifies VIGAN's dedication to technological advancement.

Recently, VIGAN introduced a new generation of high-capacity pneumatic CSUs (800tph). Scaling up machine size involves addressing various factors, including turbine dimensions, piping diameters, and air-lock capacities. VIGAN has adeptly managed these challenges, demonstrating its responsiveness to evolving industry demands.

Kuryk, Kazakhstan, Loader 700tph.

Conclusion

VIGAN stands as a beacon of innovation and reliability in the field of bulk handling equipment. With a rich history dating back to 1968, the company has consistently demonstrated its commitment to quality, customer satisfaction, and technological advancement. By maintaining a vertically integrated production process and investing in state-of-the-art facilities, VIGAN ensures that every machine meets the highest standards of performance and durability.

As it continues to expand its global footprint, VIGAN remains dedicated to addressing the evolving needs of its clients, offering tailored solutions that enhance operational efficiency in ports worldwide.

VIGAN's factory in Nivelles, Belgium.

With a strong emphasis on sustainability and a proactive approach to innovation, VIGAN is well-positioned to lead the industry into the future, solidifying its reputation as a trusted partner for businesses in the maritime sector.

Prime Urban logistics space for rent in the heart of Europe

Few European capitals can offer what Brussels does: a fully operational port just minutes from the city centre. The Port of Brussels, stretching along six kilometres of quays and covering 116 hectares, is both a logistics powerhouse and a gateway to one of Europe's most dynamic urban markets.

Now, it offers a rare opportunity for companies seeking affordable warehouse space in a truly central location.

Two major warehouses now available

The port has recently released two large logistics buildings for rent within the centre of the city — an area recognized for its accessibility, multimodal potential and strong business ecosystem.

The first facility spans 4,560 square metres on a single level, equipped with eight loading docks and 81 square metres of office space. The second covers 6,600 square metres across two levels, divisible into three sections, and includes 17 loading docks and 574 square metres of offices.

Both sites are designed for maximum operational efficiency and flexibility, ideal for logistics, warehousing, distribution or light industrial use. Located along the Brussels Canal, in the extension of the redeveloped Tour & Taxis district, they combine industrial capacity with urban convenience — just five minutes from downtown Brussels and directly connected to major road networks.

A strategic gateway for urban logistics

For companies that need to reach customers quickly, the port's location is a decisive advantage. Its proximity to the city centre makes it particularly attractive for last-mile distribution, while its links to the regional and European transport networks ensure efficient long-distance operations.

Even for tenants without direct access to the waterway, being based within the port ecosystem offers significant benefits: shared logistics services, access to partners specialized in multimodal transport, and optimized flows that help reduce both costs and emissions.

Part of a sustainable vision

The Port of Brussels is positioning itself as a European reference for sustainable urban logistics. It supports projects that reduce CO_2 emissions, promote circular economy practices and encourage cleaner delivery models. Barges already play a growing role in transporting construction materials and goods into the city, helping to take thousands of trucks off the road each year.

By choosing to locate within this ecosystem, companies not only gain a central address — they also contribute to a broader shift toward more responsible, low-carbon urban logistics.

An opportunity in a rare market

Available logistics space in city centres is scarce across Europe, and Brussels is no exception. The port's offer stands out precisely because it combines scale, accessibility and sustainability within an urban setting.

For companies looking to establish or expand operations in the Belgian and European capital, these two warehouses represent a unique opportunity to secure space in a location that connects industry, innovation and the city itself.

At the Port of Brussels, logistics is not pushed to the outskirts — it's at the heart of the city, and the heart of the future.

New E-Crane 4000-Series: Setting the standard for bulk material handling

E-Crane has been offering electrically driven solutions for bulk material handling for more than 35 years. E-Crane is achieving a remarkable success with its new 4000-Series E-Crane. The 4000-Series is characterized by a maximum capacity of 47 metric tonnes in grab operation and 58 metric tonnes in hook operation, and comes in four variants with reaches of 38, 42, 45, and 48 metres.

In 2025, four cranes were delivered as floating 'transshipping solutions,' and two cranes will be delivered at the beginning of 2026 as rail-mounted harbor cranes. The foregoing demonstrates the wide applicability of this machine. The great flexibility in configuring the optimal E-Crane solution (floating, rail-mounted, mobile on crawlers, etc.) makes this machine suitable for numerous applications. With a lifting capacity of 50 tonnes, the 4000 Series is also suitable for containerized bulk-handling applications when equipped with a special rotating spreader.

This crane comes standard with a number of interesting features.

- E-CARE software provides real-time monitoring and data analysis. This option is always offered free of charge, without the need for expensive software updates or subscription fees.
- The hydraulic cylinders have been given a 200-micron thick Cr-Ni protection to prevent corrosion in a maritime environment.
- Designed for on- and offshore use.
- Extraordinary energy efficiency, handling bulk materials at the lowest cost per ton.
- Reliability and lifetime that are the trademark of all E-Cranes.
- Ideal for containerized bulk handling, loading vessels up to Capesize.

The first prototype of this series has now accumulated well over 80,000 hours in the most demanding working environment, handling scrap with a 15m³ orange peel grab at outreaches of up to 48 metres. A true testimony of the quality and longevity of the equipment.

4000-Series E-Cranes are making the difference for users in Europe, Asia as well as North- and South-America.

MPL and Belgian sugar exports accelerate as harvest yields strong results

With the start of the sugar campaign just behind us, Belgian sugar exports are gaining momentum. During the previous sugar season, Belgian freight forwarder Manuport Logistics (MPL) transported 28,599 containers, representing 719,000 tonnes of sugar. The forwarder plays a key role in Belgian sugar exports, which remained stable at 112 kilotonnes in July 2025 but were 43 percent lower than a year earlier. Expectations are higher for the current season, partly due to favourable weather conditions and rapid initial growth of the beets.

Belgium is one of the world's largest exporters of sugar, with West Africa and the Mediterranean region as its top destinations. MPL transports bulk sugar for more than 25 customers, including producers and traders. Of the nearly 29,000 containers transported, 26,184 went to export markets.

An above-average harvest is expected in Belgium and the Netherlands for the new 2025/26 season. Early sowing and favourable weather conditions are the basis for this expectation. However, low prices and new diseases remain causes for concern, including Rubbery Taproot Disease (RTD) and Syndrome Basses Richesses (SBR). In Germany, the harvest forecast was revised downward by the EU in July.

On a global scale, sugar production appears to be leading to a surplus once again. Consultancy firm Czarnikow expects a surplus of 7.4mt (million tonnes). That is 1.2mt more than the estimate presented by the company in August. This change is mainly due to a higher estimate of sugar production.

The consultancy firm now estimates that sugar production will reach 185.3mt. That is 700,000 tonnes more than previously and represents the second-highest production level ever. On the other hand, expected consumption is expected to be lower. A decrease of 200,000 tonnes will result in consumption of 177.8mt, slightly less than last season.

"If the low world market price persists, this could ultimately put pressure on exports. Producers may then choose to store sugar instead of exporting it," says Philippe Baeten, Global Commercial Manager Sugar at Manuport Logistics.

The infrastructure of the port of Antwerp plays a crucial role in processing these volumes efficiently. Europe's largest independent sugar terminal is located in the port of Antwerp. The parent company Euroports ensures the smooth flow of Manuport Logistics' sugar shipments through its terminal. Thanks to this strategic location, the Belgian freight forwarder can offer integrated sugar logistics, from receipt and storage to worldwide transport.

Bagging the best solutions

in FIBCs, bagging and packaging of bulk materials

Tubular film is fed into a packing machine where it is cut and sealed with ultrasonic technology, ensuring it is 100% closed. This sealing method creates a permanent, tamper-resistant closure that holds up reliably during transport and storage.

Sustainability for packing excellence: how packing equipment manufacturers enhance efficiency and sustainability

When we hear the word 'sustainability', many people jump to a definition that focuses solely on environmental impacts, *writes Frank Ormeloh, Business Unit Manager for Cement at HAVER & BOECKER.* However, in the truest sense of the word, sustainability encompasses three factors — social, economic and, of course, environmental.

As with all businesses, cement plants have been drawn into the sustainability conversation. As pressure mounts to save resources and reduce carbon footprints and energy consumption, cement plants are developing smart and efficient practices to meet strict environmental standards. To reach sustainability objectives, facilities need to scrutinize the entire plant to identify the most effective solutions. Yet many operations overlook packing and loading lines, writing them off as insignificant to sustainability. However, plants can reduce resource consumption and improve product protection by optimizing every system, and that includes the packing process.

Some key areas to focus on while optimizing a plant for sustainability include choosing the right equipment and components that can be customized to the plant as well as considering machine designs that allow for upgrades and enhancements. These options increase the longevity of the packing line while improving filling accuracy and reducing lost product.

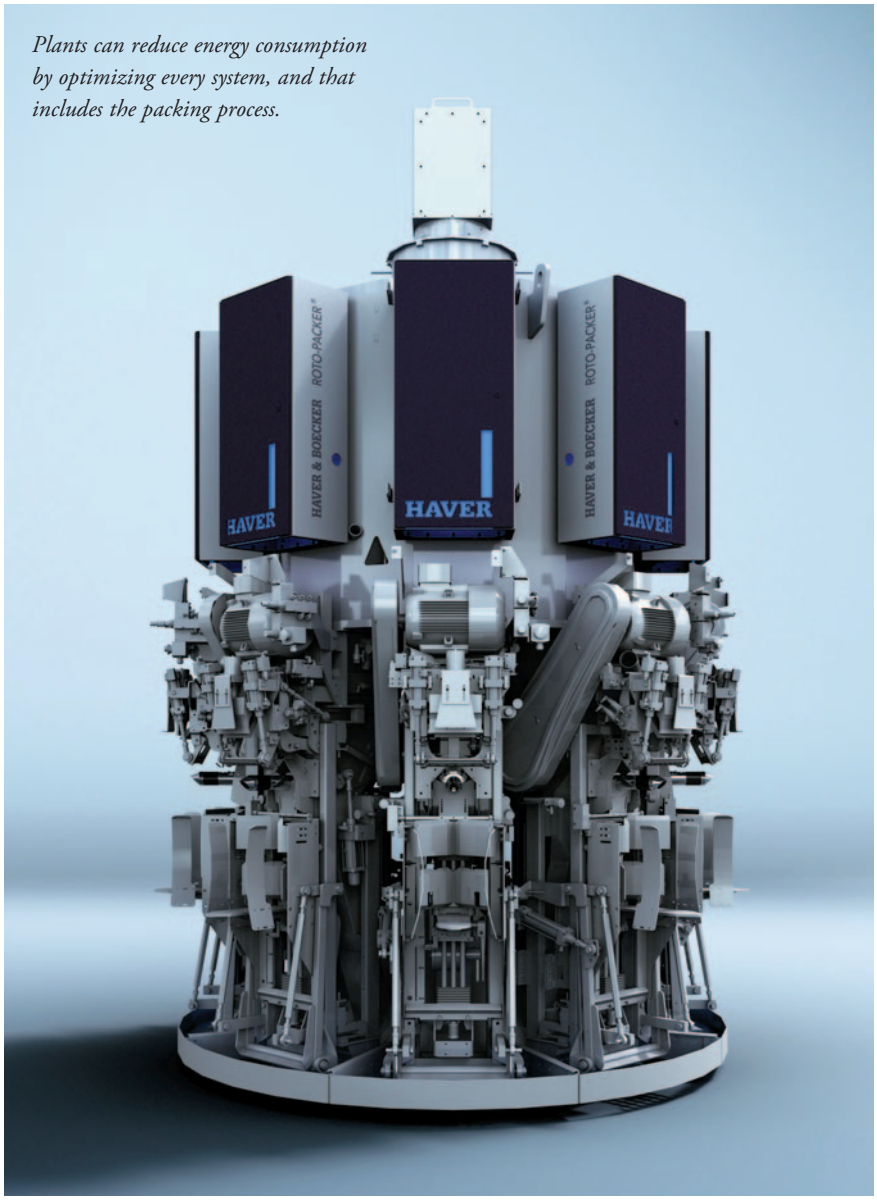
Cleanliness, health and safety

Many producers believe dust is an inevitable byproduct of cement production. This is a myth. It is true that packing powdered material, for example, requires the addition of air to move the material, inevitably creating dust. However, dust suppression technology available today can offer nearly dust-free working conditions. By reducing dust, minimizing product loss and promoting the careful use of resources, the employee, the environment and the bottom line all benefit. Maintaining cleanliness also enhances employee health and provides a safer working environment. Reducing dust is just one way to enhance sustainability in a packing plant, though. Adjustments at

nearly every stage of the filling process — from feeding and dosing to packing and loading — can have a positive impact.

Feeding & dosing

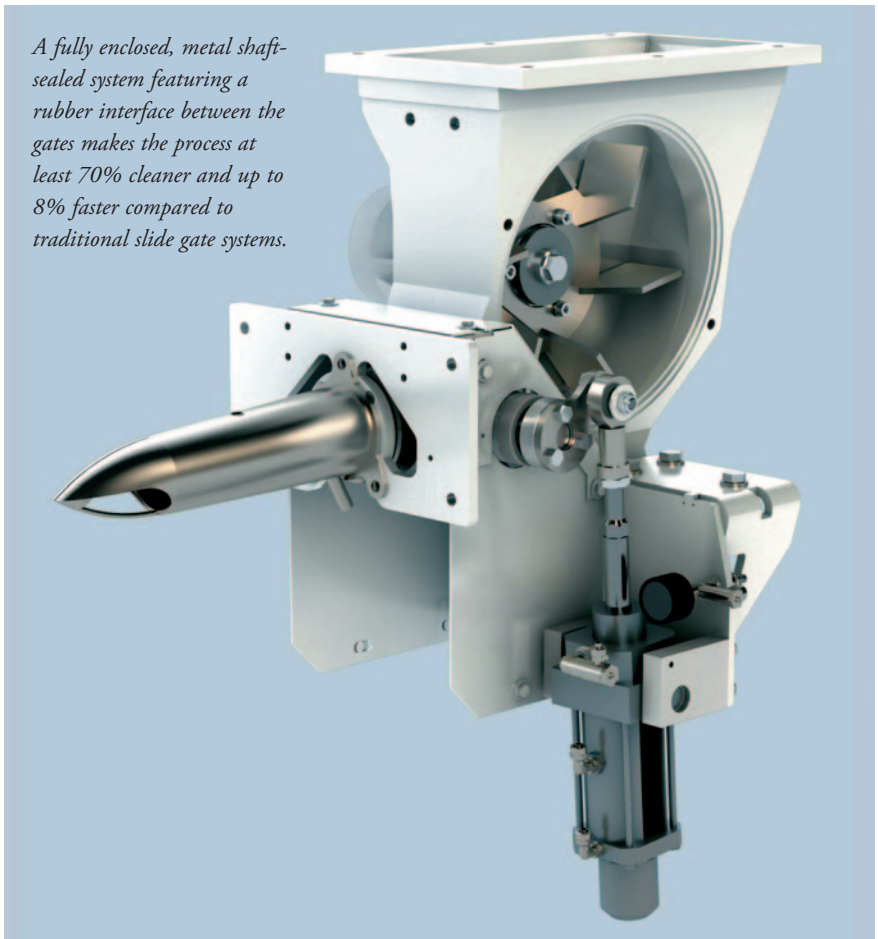
The first step in the packing process is when material is fed into the packer silo. The material is then moved through a rotary feeder and a dosing system. In this initial step, many machines feature a slide gate dosing unit, which leaves a gap of several millimetres where dust and spillage can escape. To reduce dust production and protect against spillage, operations should consider a fully enclosed, metal shaft-sealed system featuring a rubber interface between the gates. This simple changeout makes the process at least 70% cleaner and up to 8% faster compared to traditional slide gate systems. The only dust and spillage that can escape using this system comes from the way the filling spout and the bag valve interact — a challenge that some manufacturers are prepared to address with services such as updated bag sealing technology.



Plants can reduce energy consumption by optimizing every system, and that includes the packing process.

Sealing technology

Advanced sealing technology goes a long way in addressing material loss during bag filling and sealing. Standard rigid filling spouts require the unsealed valve bag to adhere to the tube, leaving room for product to escape. Once packed, unsealed valve bags rely on the inner pressure of the bag to close, which results in the bag being only 70% closed and leaves a 30% opening for spillage.



A fully enclosed, metal shaft-sealed system featuring a rubber interface between the gates makes the process at least 70% cleaner and up to 8% faster compared to traditional slide gate systems.

To solve this challenge, premium manufacturers offer specialized inflatable filling tubes that hermetically seals the gap between the bag and the filling spout during the filling process. This translates to no dust escaping through the valve and, when filling is complete, the bag is removed from the spout, and the valve is welded shut by an ultrasonic sealing unit. This creates a cleaner working environment with less product loss, cleanup and energy consumption and better weight accuracy. During palletizing, transportation and storage, these completely sealed bags can make producers stand out with custom designs and a clean packing solution.

Form, fill, seal (FFS) technology

Another factor that should be considered for reducing product loss is the type of bag, and its compatibility with the packing equipment. Specialized manufacturers analyse the material being packed and the bags used before making recommend-

ations. These customized recommendations increase the harmony between the bags, packing machines and product. For example, tubular film bags are ideal as a completely sealed, weatherproof and leakproof solution for a wide range of industries, spanning from cement to building and chemical products. Tubular film is fed into a packing machine where it is cut and sealed, ensuring it is 100% closed. This sealing method creates a permanent, tamper-resistant closure that holds up reliably during transport and storage — a key advantage over other methods that may weaken under shifting conditions. These tubular film bags are also completely emptiable, eliminating product loss for the consumer. Plus, they are recyclable, providing an additional sustainability benefit.

If making the switch to an FFS or tubular film machine, consider the manufacturer and the machine itself. Some FFS machines use vacuum methods to compact material as it's filled into the bag. On the other hand, some machines are equipped with vibration technology to accomplish this task, which is much more effective and allows for the same amount of product to be packed into a smaller bag, meaning less film used per bag. Over time, this translates to significant environmental and economic advantages. The fully sealed bags remain clean and uniform, which can draw in more customers. The weatherproof qualities of these bags make handling and storage easier.

Specialized inflatable filling spouts seal the bag to the spout throughout the filling process. This translates to no dust escaping through the valve and, when filling is complete, the bag is removed from the spout, and the valve is welded shut by an ultrasonic sealing unit.

Automation

Once equipment and bag material choices have been made, it's time to look at automation, which helps significantly impact efficiency and sustainability. A fully automated packing line allows for more flexible line layouts and negates the inefficiencies caused by human error or manual limitations. Though both may seem like small matters, the effects add up over time. Automation also allows skilled labour to focus on higher-value tasks, improving overall workforce utilization.

Manual processes, such as bag placement, leave room for lost productivity and errors from tired or distracted workers, who may be late placing a bag on the filling spout or miss a bag entirely. If a bag is not placed at the correct time in the correct way, facilities see major product loss of material per missed bag.

To replace the manual process, a robotic depalletizer can transfer bags — even loose, unstrapped bundles — from the pallet to the automatic bag placer. Automated bag application systems provide steady packing by ensuring continuous and accurate bag placement. Then, the bag placer securely places the bags onto the filling spout at a rate that matches the packing machine, with an output of up to 6,000 bags per hour with some models. An automated bag application system allows for a consistent, sustained pace for bag placement that is simply impossible to achieve with manual labour.

Some plants are limited by space, making it difficult or seemingly impossible to accommodate the footprint needed for production-boosting automation. This requirement previously inhibited automation, forcing manual placement and increasing safety risks by putting operators near the packing machine. However, innovative new products developed by leading manufacturers provide systems to transfer empty bags from the bag applicator to the packing machine, eliminating the need to place the bulky applicator right next to the packing machine. With the new and innovative systems, bag applicators can be positioned away from the packing machine — even in a different room. Not only does this protect the bag applicator from the immediate surroundings of the packing machine, but it also allows the plant to position it in a way that makes maintenance easier and allows users to completely rethink their empty bag logistics process. Properly maintained equipment works more efficiently for longer, increasing sustainability and allowing operations to get the most out of their packing line. In addition to these options, palletizers — either robotic or traditional layer palletizers — can be incorporated to completely automate lines from empty to full bag.

Digitalization and Lifetime of Equipment

The integration of equipment monitoring technology across all machines is an

excellent way to achieve easier equipment optimization and preventative maintenance tailored to the needs of the plant. Maintenance warnings or optimization adjustments are displayed on the HMI, which is integrated into the control and weighing units of the machine, allowing service personnel to address concerns before they become critical and preventing unexpected downtime and lost production. Systems with a centralized digital solution connect multiple machines together to translate data from the machine control and weighing system, making updating the entire packing line easier and resulting in more versatility. These systems require relatively low investments and result in fast return on investment. One of the easiest ways to start a sustainability journey is to invest in digitalization.

Beyond digitalization, some manufacturers offer rebuilds and upgrades kits to expand the flexibility, longevity and return on investment of packing lines. These kits also help the plant adapt as changes are made to the composition of materials. Many kits come preconfigured, making connecting them much easier than other upgrade options. As businesses continue to grow, some plants will need to expand, whether that means diversifying into other materials or adding new locations.

Innovative new products developed by leading manufacturers provide systems to transfer bags from the bag applicator to the packing machine, eliminating the need to have the fully automatic bag applicator right next to the packing machine.

ETO approach

While many quality assemble-to-order systems enhance key sustainability metrics, operations that want to take things one step farther often look to packing plants that are truly engineered to order. For facilities seeking even more tailored solutions, engineer-to-order (ETO) systems offer long-term benefits by allowing companies to customize with all the features that continue to save money and boost profitability for years to come. Consider working with a manufacturer that offers a truly consultative approach to determine the best options for not only the packing machine but the entire plant. All together, these systems make packing powdered material safer, cleaner and more efficient, allowing for greater operational sustainability. Choosing the right technology is an essential step to maximize the sustainability process when it comes to preventing product loss and saving resources like energy.

Diversification and expansion

In the cement industry, circumstances change quickly, and operations need options to meet demand wherever in the world that might be. Look for a manufacturer who offers prefabricated, modular packing systems for quick installation in situations with short timelines between when a purchasing decision needs to be made and entry into a new market. These specialized systems can be disassembled and reassembled in different areas, making it a sustainable option for production facilities.

It has also become increasingly important for operations to look for ways to diversify their product output. One way cement plants can do this is by using cement byproducts to create new materials. For example, instead of burning limestone, plants can use it as a component of fertilizer, which allows for an additional source of revenue in new markets and effectively reduces the amount of CO_2 the plant produces. To accomplish this, consider working with a manufacturer that offers a depth of expertise in a wide range of industries and process engineering capabilities.

Systems with a centralized digital solution connect multiple machines together to translate data from the machine control and weighing system, making updating the entire packing line easier and resulting in more versatility.

Our Blue Planet – for the future

No matter what the future of packing brings, when experienced cement producers and equipment manufacturers partner, it results in more sustainable, efficient plants.

The future of sustainability does not just rely solely on reducing power usage, dust suppression or even minimizing product loss. Instead, the truly sustainable operations will be those that account for the big-picture view of all factors — from environmental to social and economic.

About HAVER & BOECKER

HAVER & BOECKER is a pioneer in holistic bulk and liquid management and innovative industrial fabric solutions.

As a powerful family of technology brands and experts, it has been developing, producing and distributing high-tech fabric products, machine and plant technologies, as well as services and digital solutions for customers across all industries that aspire to technological market leadership since 1887.

In this way, HAVER & BOECKER enables producers to develop highly efficient, high-performance, safe, profitable, and sustainable products, optimize processes, and bring a unique fascination to collaborative engineering.

PAYPER presents the new bottom-up filling system

Global demand for cleaner, more accurate, and safer bagging solutions continues to grow. In this context, PAYPER — one of the international leaders in bagging and palletizing technology for solids — has added an innovation to its portfolio: the new bottom-up filling system.

This technology has been specifically designed to solve one of the most persistent challenges in the sector: minimizing dust generation during the filling process, improving both efficiency and safety and working conditions.

Cutting-edge technology for an efficient and safe solution

PAYPER's bottom-up filling system incorporates a vertical screw conveyor with an adjustable outlet device and a mechanism that lifts the bag and then lowers it gradually during the filling process. This innovative structure significantly reduces the free fall of the product, preventing dust dispersion and maintaining the minimum distance between the dosing point and the product. As a result, not only is the quality of the working environment improved, but product losses are also minimized.

One of the main advantages of this system is the reduction in dust generation, which contributes to a safer and cleaner working environment. This is especially important in industrial environments where exposure to dust can be a risk to both worker health and product integrity. In addition, the technology reduces ATEX risk by minimizing the formation of flammable dust clouds, which is crucial in industries where sensitive materials are handled.

Key benefits for the industry

The bottom-up filling system offers a number of advantages that improve both operational efficiency and the quality of the filling process. Among the most notable benefits are:

- **Minimal dust generation:** contributes to a cleaner and safer working environment, protecting operators and ensuring product quality.
- **Reduced ATEX risk:** by preventing dust dispersion, the possibility of generating dust clouds that could compromise safety in hazardous areas is reduced.
- **Resource optimization:** thanks to the reduced product capture by the suction system, savings in materials and resources are achieved, improving profitability.
- **Preservation of product properties:** by preventing material fluidization, the system ensures that the original characteristics of the product remain intact during the bagging process.

This system is particularly recommended for high-value powdery products or those that require high standards of hygiene and safety.

Leader in bagging solutions

With over 50 years of experience in manufacturing advanced bagging and palletizing solutions, PAYPER has consolidated its position as one of the leading manufacturers of state-of-the-art bagging lines for bulk solids. With the launch of the bottom-up filling system, the company reaffirms its commitment to innovation, efficiency, and industrial safety, offering its customers solutions that optimize their processes and improve the quality of their operations.

This new system reinforces PAYPER's ability to serve a wide variety of industrial sectors, providing customized solutions that respond to the most demanding challenges in the market.

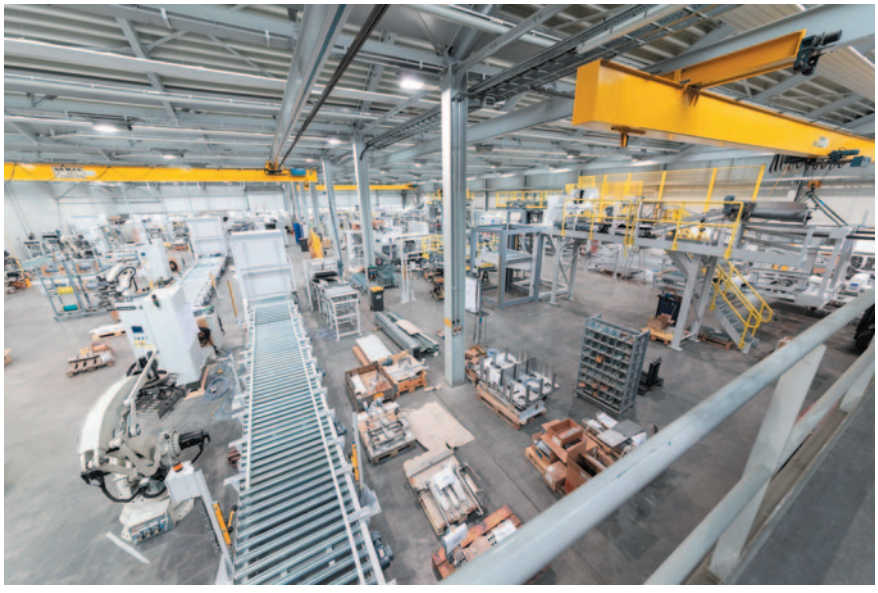
Conclusion

The innovation presented by PAYPER at Powtech Technopharm 2025 with its bottom-up filling system marks a turning point in the bagging industry. With this solution, the company not only improves process efficiency, but also demonstrates its commitment to creating safer and more sustainable work environments.

As demand for more efficient and safer solutions for bagging powdery products continues to grow, PAYPER continues to lead the way with technologies that drive the future of the industry.

Efficiency, precision, and future-readiness: why automating the packaging process with fully automatic packaging machines & palletizers makes sense

In times of increasing globalization, rising raw material prices, and growing demands for efficiency and sustainability, manufacturing companies are under significant competitive pressure. Especially in the field of packaging logistics, processes must be optimized, costs reduced, and quality and flexibility ensured at the same time. One of the most effective measures to meet these challenges is the automation of the packaging process using fully automatic packaging machines and palletizers — a core competence of the Austrian company STATEC BINDER.



From manual labour to high-performance automation

Traditionally, packaging and palletizing products was a labour-intensive, error-prone, and time-consuming process. Today, modern packaging systems perform these tasks automatically — precisely, quickly, and reliably. For example, STATEC BINDER is one of the world's leading manufacturers of such high-performance systems. The company designs and produces customized packaging and palletizing systems suitable for a wide variety of bulk materials — from sugar and rice to plastic granules, fertilizers, or animal feed. The shift to automation is not a luxury, but a decisive step towards future-proof production.

Increased efficiency through precise process control

One of the greatest advantages of automation lies in the significant increase in efficiency. Fully automatic packaging machines operate at consistently high speed and precision — regardless of shift times, fatigue, or staff shortages. By using state-of-the-art control and weighing technology, each product is precisely dosed and packaged. This ensures consistent sack quality, minimal material wear, and maximum process reliability. Automated systems can also be seamlessly integrated into existing production lines and, depending on customer-specific requirements, can be controlled from a single operating unit.

Cost reduction through fewer errors and downtime

Another key advantage is cost efficiency. Errors caused by manual packaging — such as incorrect filling quantities, damaged bags, or faulty palletizing — lead not only to waste but also to additional follow-up

costs. Automatic systems such as those from STATEC BINDER minimize these risks. Thanks to precise control, robust design, and integrated quality checks, consistently high packaging quality is guaranteed. In addition, automated systems significantly reduce downtime. Intelligent diagnostic systems detect irregularities at an early stage and provide maintenance recommendations before a failure occurs. The result: maximum system availability and higher profitability. Through automation features such as automatic reel change on FFS packaging machines, even continuous production without personnel intervention can be achieved.

Safety and ergonomics for employees

Automation also offers clear advantages in terms of occupational safety. In many industries, packaging heavy bags or manually stacking pallets is physically demanding and potentially hazardous. Fully automatic palletizers perform these tasks efficiently and safely. This means less physical strain and a significantly reduced risk of injury for employees. At the same time, workers can be deployed for higher-value tasks such as supervision or process control — a clear benefit for motivation and skill development. Handling heavy bags is increasingly difficult to staff, which makes the use of automated packaging machines and palletizing robots particularly productive when dealing with large containers.

Flexibility for different products and markets

Modern packaging solutions must be more versatile than ever. Different product sizes, materials, and markets require flexible systems that can be quickly adapted to new requirements. STATEC BINDER has therefore developed modular machine concepts that are adaptable and expandable. Whether open-mouth bags made of PE (polyethylene), PP (polypropylene), paper, or FFS (Form-Fill-Seal) systems — the machines can be configured individually. Combined with intelligent palletizing robots, they create a complete end-of-line solution perfectly tailored to each product.

Resource efficiency

Precise dosing prevents material waste, and optimized packaging density saves space and energy during transport. Even during operation, modern systems stand out with energy-efficient drives, durable high-quality materials, and optimized control systems that reduce both energy and compressed air consumption.

Profitability and return on investment

Investing in fully automatic packaging and palletizing solutions quickly pays off. Although the initial investment costs are higher than for manual systems, the long-term savings from higher efficiency, lower labor costs, and reduced waste far outweigh them.

Moreover, companies can increase production capacity when needed — without additional labour or floor space. For globally active businesses or those serving growing markets, this represents a decisive strategic advantage.

STATEC BINDER: quality and experience from Europe

Based in Austria, STATEC BINDER has long stood for high-quality packaging systems and excellent service standards. With more than 1,900 installations in over 85 countries and a global network of service partners, the company ranks among the leading providers of automated packaging technology. The combination of engineering expertise, solution-oriented design, and customer focus makes STATEC BINDER a trusted partner that develops customized solutions for every industry — from agriculture to chemicals. Reliability, efficiency, and longevity are at the core of every project.

Conclusion: Automation As The Key To The Future

Automating the packaging process with fully automatic packaging machines and palletizers is far more than a technological upgrade — it is a decisive step toward efficient and future-ready production. Companies that invest in modern automation technologies benefit from higher productivity, lower costs, improved quality, and greater flexibility. With STATEC BINDER's innovative solutions, they rely on proven technology and a partner that combines efficiency and precision to perfection.

The rise of mobility: how IMGS Group is redefining global trade efficiency through bagging

In the race to move cargo faster, the biggest breakthroughs don't happen on ships or cranes — they're happening on the ground.

Across ports and terminals worldwide, a quiet revolution is reshaping how bulk commodities are handled, stored, and delivered. Mobile bagging, once a stopgap for remote sites, has become the heartbeat of modern logistics — cutting time, reducing losses, and keeping trade moving even when infrastructure can't.

Global demand for bulk bagging systems is projected to exceed US$25 billion by 2030, driven by rising food and fertilizer flows and the push for port automation. For operators, every saved hour can mean tens of thousands of dollars — and for emerging markets, it can mean the difference between affordable food and empty shelves.

At the centre of this shift stands IMGS Group, a logistics innovator proving that mobility is no longer optional — it's essential.

IMGS deployed mobile quayside bagging machines producing up to 250 bags per minute.

Fertilizer in motion: feeding a region on schedule (East Africa)

When fertilizer shipments docked in East Africa just weeks before planting season, delays weren't an option. IMGS deployed mobile quayside bagging machines producing up to 250 bags per minute, transferring products directly from vessel to truck.

Every minute saved kept distribution

IMGS deployed mobile one-tonne bagging machines inside a warehouse, achieving throughput rates of up to 140tph (metric).

IMGS combined pneumatic vacuvator systems with mobile bagging machines, sustaining throughput above 100tph.

costs down — allowing more farmers to access fertilizer when it mattered most. In regions where logistics dictate affordability, speed becomes food security.

Engineering under pressure: the warehouse that didn't fit (Central Africa)

In a Central African warehouse with barely enough headroom for standard machines, bagging had come to a standstill. IMGS redesigned the setup on the fly — shortening conveyors, widening clearance, and swapping belts for bucket conveyors that lifted cargo without spillage.

The result: a compact, 24-hour operation that kept exports on schedule.

Adaptability isn't just a feature; it's problem-solving in motion.

Vacuvator bagging — when gravity fails, suction wins (West Africa)

A shortage of bulk trucks once threatened to halt a major wheat discharge in West Africa. IMGS combined pneumatic vacuvator systems with mobile bagging machines, sustaining throughput above 100tph (tonnes per hour).

The closed-loop suction setup reduced product loss by 95 % and avoided costly demurrage — turning a potential delay into an efficiency benchmark.

Silo bagging: turning volume into velocity (Middle East)

At a grain terminal in the Middle East overwhelmed by demand, IMGS's mobile silo bagging machines delivered scale without new infrastructure.

Positioned beneath grain bins, they bagged at 150tph — over 2,000 bags every hour with ±0.2 % accuracy. Constructed from marine-grade materials and designed for 24-hour operation, they kept exports flowing at harvest's peak.

When demand surges, mobility multiplies capacity.

IMGS positioned mobile bagging machines beneath grain bins, producing over 2,000 bags per hour with a precision margin of ±0.2%.

Emergency readiness: sand bagging for flood control (Asia)

When floodwater rose along a coastal port in Asia, IMGS's mobile sand bagging machines were operational in under an hour.

Each double-stitched bag was identical in weight and shape — vital for building uniform flood barriers.

Equipped with dual bagging lines delivering up to 30 bags per minute, the system doubled productivity when speed mattered most.

Built for high-moisture environments, it proved how precision and mobility can literally hold back the tide.

IMGS's dual bagging lines produced 30 sandbags per minute, doubling productivity in flood-control operations.

Mobility as the new standard

From fertilizers in Africa to grains in the Middle East and flood-control operations in Asia, IMGS's systems share one outcome: continuity.

Where fixed infrastructure limits scale, mobile bagging unlocks it — bringing ports closer to productivity, and productivity closer to people.

Recognized by leading industry bodies for Best HSE-Compliant Bagging Solutions (MENA 2025) and Most Trusted Mobile Bulk Bagging Solutions (UAE 2025), IMGS's results speak louder than awards: consistent performance, proven reliability, and mobility that keeps trade in motion.

Its expanding network across Africa, the Middle East, and Asia reinforces a clear truth — flexibility isn't an advantage anymore; it's the baseline for global logistics resilience.

Because trade doesn't wait

The world's cargo flows aren't slowing down. The ports that thrive will be the ones that can adapt, move, and mobilize.

From quayside to inland, IMGS Group is leading that evolution — one bag, one port, one breakthrough at a time.

Because in global logistics, mobility moves markets — and IMGS moves mobility.

Saccheria F.lli Franceschetti Spa: aims to become the 'Amazon of FIBCs'

Bagging is more than just one in the logistics chain; it's a strategic operation that can define the efficiency, safety, and profitability of the entire process. This awareness is the driving force that motivates Saccheria F.lli Franceschetti every day to transcend the traditional concept of 'bags'.

Background: the energy of a startup, the wisdom of experience

Saccheria F.lli Franceschetti's story is a fascinating hybrid. Imagine a tech startup with over half a century of experience in its DNA. The third generation is now at the helm of Saccheria F.lli Franceschetti: a team of young talents who have inherited immense expertise and have decided to project it into the future with fresh energy and vision. The new generation wants to do more than simply take the baton — they want to run faster. The company's mission is to make the movement of bulk goods so smart and seamless that it seems almost magical.

Equipment manufactured: flexible solution architects

Saccheria F.lli Franceschetti does not call itself an equipment manufacturer, but rather a solution architect. The company's flagship product, the FIBC (Flexible Intermediate Bulk Container) is not a standard item, but a logistics platform that Saccheria F.lli Franceschetti tailors to its partners' specific needs. Customization is complete: from the type of fabric to the configuration of the lifting straps, from the loading and unloading valves designed to interface with the customer's machinery with pinpoint precision, to the internal liners that ensure maximum protection. Saccheria F.lli Franceschetti works for every imaginable sector: from the food industry, where its safety and hygiene standards are an obsession, to the chemicals industry, where robustness and reliability are vital, to the booming world of the circular economy.

Customers and market: partners of leaders, always challenging the status quo

Saccheria F.lli Franceschetti's partners are leading companies in the food, chemical, pharmaceutical, and mining sectors. They are the visionaries, the innovators, those who don't settle for a standard solution because they know that competitive advantage lies in the details.

Saccheria F.lli Franceschetti does not spend much time looking into the rearview mirror at competing companies; rather, it considers its real competition to be against the inefficiency, complexity, and status quo of an often overly traditional industry. While others compete on the penny, Saccheria F.lli Franceschetti competes on the intelligence of the solution. Its advantage is based on three pillars:

- **Technical agility:** Saccheria F.lli Franceschetti is structured like a modern company. Lean processes, quick decisions, and a digital platform

eliminate distances and downtime.

- **Radical innovation:** the company's R&D focuses not only on materials, such as the use of rPET (recycled polyethylene terephthalate) for more sustainable FIBCs, but on the entire service model, to create a frictionless customer experience.
- **Corporate culture:** Saccheria F.lli Franceschetti is young, hungry, and customer-obsessed. It is not a call centre; it is a team of problem-solvers. This 'Google-style' approach translates into a responsiveness and proactivity that more rigid competitors can't replicate.

Recent developments: from supply to strategic consulting

Saccheria F.lli Franceschetti's most recent projects go far beyond simple supply. It does not send a catalogue; its experts often go into the field. The company works alongside its partners, analysing their production lines, their flows, and their machinery. Saccheria F.lli Franceschetti's approach is that of a strategic consultant whose goal is to find the perfect solution. Whether it's redesigning a FIBC to reduce filling times or designing one that improves operator safety, the result is never just a 'bag', but a measurable improvement in the efficiency and safety of supply chains.

Future vision: toward smart and sustainable logistics

Saccheria F.lli Franceschetti firmly believes that the future of the bagging industry lies not just in containing, but in enabling smarter and more responsible logistics. The FIBC is evolving from simple packaging to an active node in the supply chain, a key element for optimizing flows and, above all, reducing environmental impact.

Saccheria F.lli Franceschetti's research focuses on this: innovative materials, designs that maximize efficiency and promote reuse, and a service model that transforms a product into a strategic solution.

Bagging isn't the end of the line; it's the beginning of a journey. And Saccheria F.lli Franceschetti is here to make it as smart as possible.

Through its e-commerce site, Saccheria F.lli Franceschetti has revolutionized the Italian market for 'General Catalogue' products, and it will soon expand beyond national borders to meet the needs of an ever-increasing number of consumers within the EU: Saccheria F.lli Franceschetti wants to become the Amazon of FIBCs!

Doubling production with All Fill: Neutradol invests in a second auger filling machine

All Fill has been designing and manufacturing world-class auger-based filling equipment since 1984. Its solutions, ranging from free-standing semi-automatic filling machines right up to fully automatic turn-key production lines, are trusted by leading brands worldwide to keep operations running smoothly and efficiently.

One such brand is Neutradol (MS George), a household name in odour elimination. Unlike ordinary air fresheners that simply mask bad smells, Neutradol's science-led formula destroys odours at a molecular level, leaving air clean and fresh. With a growing product range and increasing demand, the company continues to invest in technology that keeps its manufacturing efficient and reliable.

Recently, Neutradol strengthened its production line with the purchase of a new single-head filling machine from All Fill — the company's second investment with the filling specialists.

Responding to growth

"In the last two years, orders have really picked up on our carpet fragrance deodorizer," explains Mark Egan, Factory Manager at Neutradol. "We decided it was time to get a second filling machine to keep up with demand."

The business already had one All Fill filler in place, which had been running smoothly for eight years. "It's a powerful, reliable piece of kit that's still going strong," Egan continues. "For our new machine, there was never any question of going elsewhere. We wanted the same All Fill model, but the latest version."

Seeing the new machine in action

Before signing off on the investment, Egan and a colleague visited All Fill's factory. "We brought samples with us so they could run a live test and demo the new features. In principle, it's the same machine as our first one, but little advancements in the technology make a real difference in terms of efficiency and ease of use.

"They also walked us through how to clean and maintain it, and how to change different parts. Despite our eight years of experience with All Fill, we found ourselves impressed with everything we saw. Following this visit, we were more than happy to commit and book the installation."

Smooth installation, instant results

The machine was installed in just one day with minimal disruption. From that point, production capacity doubled almost overnight.

"With two All Fill machines running side by side, we now have the throughput we need," says Egan. "Both the old machine and the new one run extremely well. Breakdowns are very rare and downtime is kept to a minimum, which is a huge benefit, as these machines are central to the efficiency of our production. As a bonus, the machines are easy to use. Recent improvements to the technology have made it especially intuitive. We can train new operators on them in no time."

A reliable partner

Although Neutradol rarely needs aftersales support thanks to the machines' reliability, Egan highlights the value of having All Fill on hand when needed:

"On the odd occasion we've needed their assistance or a spare part, they've been very accommodating. They're a knowledgeable and friendly team, always happy to help."

Looking ahead

With the second filler in place, Neutradol's carpet deodorizer line is future-proofed for growing demand. "We'd happily buy another All Fill machine," Egan concludes. "Space is our only limitation. But with our production capacity now doubled, our growth is as secure as it can be. We're very happy with the investment and I would highly recommend All Fill to any business in the market for top-quality filling equipment."

About All-Fill International

All-Fill International is a respected designer and manufacturer of high specification auger-based filling equipment.

From the manufacturing plant in Sandy, Bedfordshire, UK, All-Fill employs a workforce with the expertise and experience necessary to design and manufacture auger filling equipment with an exceptional build quality. Through comprehensive research and development, innovative solutions are provided to match precisely powder filling and container handling needs.

All-Fill International's range of machines are suitable for dosing a wide range of powders, free-flow or non-free-flow, compactible, heterogeneous, in a single machine (volumetric or gravimetric) with a reduced number of format parts.

All-Fill's products range from the micro-dosing station to the complete rotary

filling line, via semi-automatic filling heads, and even integration on automatic vertical or horizontal bagging machines (VFFS and HFFS) and multi-lane filling from 2–14 lanes.

Whether the task requires a semi-automatic machine to fill ten containers per minute or a fully automatic machine capable of filling 200 containers per minute, All-Fill has a product to meet every scenario. As this range of auger filling machines are able to be customized to highly specific requirements and manufactured to tight customer specifications, the All-Fill design team will work in collaboration with customers to ensure that all goals are reached and a mutually successful outcome is achieved.

Typical doses on All-Fill International's auger filling machines range from as low as 10mg all the way up to 50kg and speeds can be as high as 400 containers per minute, all without compromising accuracy and integrity of fill.

Filling can take place into a range of containers, jars, pots, glass, plastic composite, pouches and sacks. Solutions that reduce giveaway and waste, additional high accuracy top-up, or those that meet strict hygiene requirements can be integrated into All-Fill's filling machines.

Quick and easy product changeovers are achieved by using a simple bayonet type fitting to fit or remove the auger. When it comes to removing other product contact parts, these are all tool-less, with options to allow either the complete removal of the product hopper, or a quick access 'clean-in-place' solution of a hinged, opening 'clam-shell' type hopper.

Customer focus is at the heart of any successful business and it's no coincidence that All-Fill has a high number of repeat orders from satisfied customers. All-Fill offers a range of after-sales support functions including installation, commissioning, training, spare parts and service visits. The experienced service team are on hand to provide support via phone and email and in person as needed.

Whilst at a first glance it might appear that many powders behave in a similar manner, All-Fill always ensures that products are tested thoroughly to determine achievable speeds, accuracies and cleanliness. A dedicated testing resource is available to thoroughly assess each product and advise on appropriate tooling that should be used to maximize performance.

All-Fill International is often called upon to take product from a bulk supply such as an IBC, and re-package this into smaller sacks or bags, typically for retail use. A specialized version of the versatile Series 10 has been developed to target this market and provide effective solutions to customers.

This Series 10 Sack Filler has been designed specifically to meet the demands of filling larger bags and sacks — a fully integrated loadcell and roller platform help meet ergonomic and safe handling requirements, whilst the electro pneumatic sack clamp means the operator can be freed up during the time taken to fill the bag.

Integrated internal dust extraction pipes create a partial negative pressure inside the sack during filling and cause an inflow of external air through the mouth of the sack. This system minimizes the risk of poor quality seals through dust contamination of the sack sealing area during filling.

Starlinger at K 2025 trade fair: the Power of Circular Packaging

*'Circular Packaging': Starlinger offers the technology for producing AD*STAR bags made from polypropylene fabric in a closed loop (photo ©Starlinger).*

Plastic packaging for a sustainable future: Starlinger offers technical solutions for closed-loop systems in woven plastic packaging.

"Plastic packaging is the packaging of the future," stated Harald Neumüller, CSO of Starlinger. "Plastic is not the problem, it's the solution. Our vision is to use our innovative technologies to make plastic packaging the most sustainable type of packaging. The state-of-the-art design of our machines enables our customers to produce mono-material plastic packaging according to 'design for recycling' criteria in the highest quality and at the lowest cost," said Neumüller.

Circular packaging — used bags are turned into new ones

With the 'Circular Packaging' concept, Starlinger offers a circular solution for dry bulk packaging made from woven plastic: it defines closed product cycles for woven packaging such as big bags (FIBCs) and other woven bags made from polypropylene, such as the AD*STAR block bottom valve bag for cement and other dry bulk goods. For 30 years, this bag has offered a durable and material-saving alternative to paper and plastic bags in the dry bulk industry. At the Starlinger booth at this year's K 2025 international trade fair for the plastics and rubber industry worldwide, which took place in October, visitors learned about the world of AD*STAR and got to know the extensive product range of this robust and sustainable bulk packaging. The latest bag variants include AD*STAR bags made from 40% post-consumer recycled material from used, recycled AD*STAR cement bags, as well as the diverse range of the AD*STAR *prime bag family.

AD*STAR *prime: the allrounder

AD*STAR *prime bags offer bag manufacturers enormous variety and flexibility: they can be produced in filling sizes from 5–118 litres, with high proportions of recycled polypropylene. They have various features such as sift-proof corners, in-liner, anti-slip coating, and film lamination.

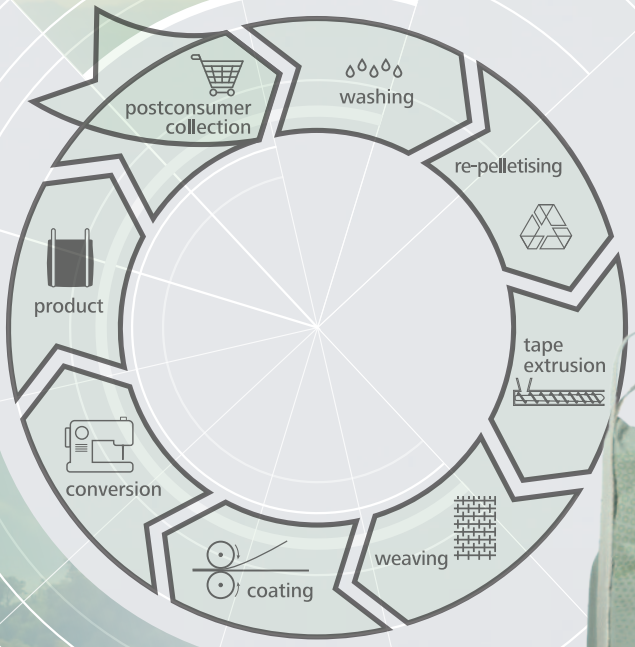
An optional easy-open closure or carrying handles ensure convenient handling. With their diversity, AD*STAR *prime bags cover a wide range of applications, allowing bag producers to operate with great flexibility. Small bags laminated with printed PP film can be used, for example, to attractively package building materials in the consumer sector, while larger bags are popular in wholesale and industrial applications for packaging cement, chemical granulates, or foodstuffs such as rice and sugar. AD*STAR bags stand out from bulk packaging made of film and paper, especially because they're super strong but lightweight, protect well against moisture, and, as double-layer versions, prevent dust formation. Being a mono-material packaging, they're also 100% recyclable.

Bag by bag to success – ad*starKON conversion technology

Packaging manufacturers produce around 32 billion AD*STAR bags per year for various dry bulk goods on over 800 Starlinger ad*starKON conversion lines worldwide. During the 'K' trade fair, Starlinger showed an ad*starKON SE bag conversion line in operation, which produced AD*STAR bags at the exhibition booth. This model has been designed as a special edition to mark the recent installation of the 500th Starlinger ad*starKON SX bag conversion line and is only available in limited quantities. Based on the successful SX conversion technology, the ad*starKON SE produces up to 120 precisely formed AD*STAR block bottom valve bags per minute and is characterized by easy-to-use 'smart' production technology, a particularly favourable price-performance ratio, and fast delivery times.

*Note: AD*STAR® and PP*STAR® are registered trademarks of Starlinger. AD*STAR® and PP*STAR® bags are manufactured exclusively on Starlinger machines.*

Starlinger



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- Closed loop system ensures top quality

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"From vision to innovation" at the Starlinger in-house exhibition

In line with this motto, Starlinger presented the latest developments in the field of woven bag production at the company's Open House in Weissenbach near Vienna, Austria, which took place before and after 'K'. They range from AI-supported automation in tape extrusion and new possibilities in fabric lamination to the stacked pallet of bags at the end of the bag production process.

Starlinger also presented the latest generation of ad*starKON bag conversion lines at the Open House. The new ad*starKON CX was unveiled to a wider audience for the first time in October 2025. It combines the best of 30 years of experience in bag conversion technology with the latest advances in process control. Maximum automation, top production speeds, and an integrated quality management system are just some of the innovations that were demonstrated to packaging producers in Weissenbach.

Welding instead of gluing – the new PP*STAR bag technology

At the Open House in Weissenbach, the new pp*starKON X production line for pinch bottom bags made of polypropylene fabric were also on display. This innovative bag type, which Starlinger markets under the brand name PP*STAR, stands out thanks to its particularly attractive design — counter-printed BOPP film laminated onto lightweight, high-strength PP woven fabric — and the pinch bottom closure, which is widely used in the end consumer sector. Its excellent barrier properties offer reliable product protection, making PP*STAR bags particularly suitable for the packaging, transport, and storage of sensitive products such as animal feed or cereals. This packaging concept from Starlinger is 'designed for recycling' too: material-saving production, made entirely of polypropylene, and produced without the use of adhesives, but by means of a specially developed welding process.

For this, the pp*starKON X pinch bottom bag conversion line is equipped with unique technological features — from the patented laser cutting system for the pinch closure to the innovative hot-air welding unit for closing the bag bottom or, if desired, the bag opening. Highly automated production, including process monitoring and effective process management, ensures a highly precise, resource-efficient and flexible conversion process.

"We provide the technologies for an economically viable circular economy," said Harald Neumüller. "Politics must now aim to establish closed product cycles, as is the case for PET plastic bottles, and create incentives for solutions throughout the entire value chain — from collection to sorting and the return to the material stream. If packaging manufacturers can operate under the right the conditions — also due to appropriate government and economic incentives — plastic packaging will become the most sustainable packaging. We have the technology to make this happen."

About Starlinger & Co Gesellschaft m.b.H.:

Starlinger is an Austrian machine manufacturing company in Vienna with production sites in Weissenbach and St. Martin, as well as in Schwerin, Germany, and Taicang, China. As a prominent supplier of machines and complete systems for the production of woven plastic bags, as well as systems for plastics recycling, PET extrusion and finishing, the Starlinger brand is synonymous with quality and technological leadership in over 130 countries. Founded in 1835, the family-owned company has been exporting its products around the world for over 50 years, with an export quota of over 99.5%. It has its own sales and service centres in Brazil, China, India, Indonesia, Mexico, Nigeria, Russia, South Africa, Thailand, the United States and Uzbekistan, each of them guaranteeing swift and professional technical service. Starlinger is a participant of the United Nations Global Compact, the world's largest corporate sustainability initiative, and adheres to the principles for responsible business set out therein. DC

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